# THE RELATIONSHIP BETWEEN FINANCIAL DATA ARTIFICIAL INTELLIGENCE AND DATA ANALYTICS, ETHICS, GENERAL DATA PROTECTION AND PUBLIC SECTOR POLICYMAKING

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A Dissertation Presented

by

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**DEDICATION**

[Peter, For my extended family. For the quiet voices.]

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## ABSTRACT

**THE RELATIONSHIP BETWEEN FINANCIAL DATA ARTIFICIAL INTELLIGANCE AND DATA ANALYTICS, ETHICS, GENERAL DATA PROTECTION AND PUBLIC SECTOR POLICYMAKING**

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This research evaluated how an AI governance framework benefits public policy. Data gathered from literature review and citizen consultation was used to evaluate engagement and financial data reviewed, were used to evaluate, and identify any challenges in this regard. The argument is made that AI is at the forefront of democracy.

The research approach is closely aligned with two philosophical traditions, pragmatism and interpretivism. It is pragmatic in ontology, it acknowledges the close alignment with an interpretivist stance on the need for diversity of thought and worldviews to develop better AI and new modes of governance. It is pragmatic in epistemology and axiology, a pragmatist acknowledges it's perfectly possible to work with different types of knowledge and methods. The research aims to contribute to practical solutions to inform future practice ethics and governance of AI, and financials, and data, and policy.

The research is abductive and methodological approach is pragmatic applying mixed methods. Rich Picture (Berg, T., Bell, S., and Morse, S., 2019) and stories "AI Scenarios" (Orlikowski, Wanda., J., 1993) in the data collection on the Carnegie Council Global Ethics Day and the Citizen Conference on the Future of Europe Platforms. Also using the European Movement Ireland Events on that platform, and the approach was 6 cycles of Action Research It encompasses individual and organizational experiences, academic and business perspectives. The research design is closely aligned with descripto-explanatory, using Leximancer, an AI augmented text analysis tools' qualitative and quantitative maps to visualize and interpret findings and connections in 36 documents and in responses to the AI scenarios.

The research found much has been written about the ethics of AI, covering everything from bias in data to moral issues around replacing human employment, denying liberty, impacting life decisions for the citizen, but there appears to be a disconnect with AI financials and AI and machine learning, data, analytics, financial reporting, and impacts for ethical government policy.

The importance of a Universal Basic Income in the context of global Government's taxation policy which develops strategies for citizen health and welfare, environmental protection, climate action, sustainable economic growth, and implements policy in the short, medium, and long-term, the UN Sustainable Development Goals, space junk, and politicians duty of care to future generations in climate change, smart cities and key urban challenges, government metaverse platform, skills development, and healthy public finances, was noted.

An adapted Algorithmic Government Today Model incorporating a new tier of Governance by AI, was developed reflecting the new modes of AI governance, including a Robot Citizen, AI Diplomat, AI software with Voting Rights, AI procurement bots, AI DAOs referencing AI, Machine Learning, Robotics, Swarm Robotics, Blockchain including cryptocurrency and decentralised finance.

AI ethical considerations for financial data, and public policy, are not always clearly identified in existing literature. It is not always clear how AI use impacts public policy

governance. The governance frameworks for blockchain, robotics, and 'other AI' needs to be improved. AI use in public policy frameworks including Regulatory Impact Analysis and AI costing, is considered. An AI augmented citizen voice was heard, using Leximancer deep learning, text mining and content analysis tool.

AI Ethics and Policy Scenarios were presented to citizens on the Carnegie Council Global Ethics Day and Conference on the Future of Europe Platforms. The responses received indicated that AI was associated with procurement bots, crowdsourcing autonomous vehicles ethics, involvement in policy but that AI wasn't associated with financial statements/accounts or scrutiny of same, or, with AI and decentralised autonomous organisations (DAOs). The role of the citizen as elector, an important role in holding elected representatives to account in their stewardship of public funds, and in policy decision, is disassociated from AI scrutiny of accounts and concern about use of Cryptocurrency, by rogue elements of society, is noted.

An argument for AI continuous accounting, and AI augmented forecasts, is made, as being key for understanding the finances and fiscal needs of public sector, and increasing transparency, automating decisions and judgements, preparation of corporate reports, scrutiny of annual reports and financial statements.

The Estonian Government Chief Information Officer (CIO) call for public auditors globally to promote a data exchange environment at government level, and interoperable public services within or across organisational boundaries, is noted. The USA Government Accounting Office governance related questions on AI in relation to big data and digital audit is also noted.

The research found AI ethics, focused on the governance of AI far more than the governance by AI.

Global ethics principles, standards and recommendations for public sector are set and promoted by the OECD, UN, World Bank, IMF, FATF, Europol, INTOSAI, and IFAC.

The FATF notes there are opportunities to use AI and its associated technologies in AML/CFT noting different benefits for the Public and Private sectors, referencing a new training offering at introductory level, for newcomers to the international AML/ CFT environment aimed at government officials from the FATF Global Network.

Europol highlighting emerging AI cybercrime risk and use of AI as a driver of crime is noted. This research emphasises the importance of education and training, noting that AI could be used to identify radicalisation, or persons put under pressure in relation to financials, and used to train in ethics including scenario testing, and in storytelling for AI software/ Robots as reinforcement learning.

The benefits of swarm robotics in public policy are highlighted. Swarm robotics are used in grants management with blockchain, also in delivering policy, including environmental monitoring, military use, and in space. The importance of the accountability and global

standards for governance of AI autonomous swarm robotics decisions is emphasized and GPDR, cyber security and Smart Cities is noted as an area for further assessment.

Practical solutions were made in relation to AI, crowdsourcing AI ethics, AI financials, use of blockchain, and RPA in financial management, educating about AML/CFT, use of AI for training AI through storytelling, ongoing training for humans. The importance of AI in audit, and AI augmented citizen engagement in policy was highlighted. and further areas for research were identified including Quantum AI ethics, AI augmented risk management, AI and national archives and financial data in public and private sectors, an increasingly contested space, AI Arts for example AI Music including the environmental impact of same. An Algorithm Charter, allows all stakeholders know the extent and remit of AI in Government entities, supporting Humans and AI in partnership is suggested. AI accessibility and potential for inclusiveness is highlighted.

The research also concludes that AI with emotional intelligence is an area for further research, including consideration of legal rights, such as ‘person status’ rights awarded to nature, and citizen rights awarded to hardware and software robots both need to be considered, that the process by which we determine who or what deserves ‘rights’ needs to be further developed for AI.

**Keywords:** AI ethics, Artificially Intelligent Public Policy, Governance, Democracy, Financials, AML/CFT, Blockchain, RPA, AI with emotional intelligence legal rights and Sustainability.

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**A Closing Thought**

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## CHAPTERS

# CHAPTER 1

# ARTIFICIALLY INTELLIGENT PUBLIC POLICYMAKING

"I cannot teach anybody anything I can only make them think" Socrates1

## 1.1 Introduction

Governments raise taxes and spend public funds to deliver many goods, services, and infrastructure for their citizens, funded through taxes, borrowing, and management of public assets. The Organisation for Economic Co-Operation and Development (OECD) (2000) stated that fair and reliable public services inspire public trust, create a favorable environment for businesses, contributing to well-functioning markets and economic growth, also that public ethics are a prerequisite to, and underpin, public trust and are a keystone of good governance, and citizens expect public servants to serve the public interest and manage public resources properly2. Public servants today are both human and digital, a workforce where because of new technological advances Artificial Intelligence (AI) robots, and software robots, work alongside the human workforce serving the public. AI ethical considerations are now a key part of public service ethics.

AI underpins the 'strategic finance' work of accountancy in many ways in electronic recording of books and ledgers. Robotics is used to solve business problems, in

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1 Goodreads., (2021). In Goodreads online. *Socrates quote*. Retrieved from: *https://www.goodreads.com/quotes/73059-i-cannot-teach-anybody-anything-i-can-only-make-them-think* (Accessed 16 May 2021)

2 OECD., (2000). *Trust in Government Ethics Measures in OECD Countries* France, Page 9. OECD. Paris. France. Retrieved from Trust in Government: Ethics Measures in OECD Countries (Accessed 16 May 2021)

data capture and cleansing supporting automated generation of regulatory reports, financial planning including automating pre-populating forecasts using historical and market data, changing the accountant's and the policy-maker's role and focus.

Information and Communication Technology (ICT) systems underpin financial and data records and new technologies are emerging daily. AI is transformative, in terms of financial management it leads to efficient and effective management of public sector bodies, enhanced governance, transparency, accountability, and better policymaking. Yet AI ethical considerations are not clearly referenced in public service ethics codes.

The Department of Public Expenditure and Reform (DPER) Ireland (2017) e-Government Strategy 2017-2020 set out a vision utilizing technology to improve citizen and business interactions with Government through, better digital and data usage, improved capabilities, enhanced governance, Open Data for transparency and innovation, and increased Citizen Engagement, to improve policies and services.3

Auditors increasingly rely upon AI and data analytics. What are the ethics and General Data Protection Regulation (GDPR) EU implications, where AI algorithms are used in financial information to determine government policy or taxation?

Much has been written about the ethics of AI, covering everything from bias in data to moral issues around replacing human employment, denying liberty, impacting life decisions for the citizen. Less is written about AI and machine learning, data, analytics, financial reporting, and impacts for ethical government policy. Government levies taxes,

3 DPER., (2017). *e-Government Strategy 2017-2020.* Pages 5-11. DPER, Dublin, Ireland. Retrieved from: https://egovstrategy.gov.ie (Accessed 16 May 2021)

develops strategies for citizen health and welfare, environmental protection, climate action, and implements policy in the short, medium, and long-term.

Government also acts as a bank by lending to the citizen for many reasons including offering mortgages, making policy decisions based on financial data whether to continue with a specific lending policy or not. Loans are issued for many reasons, enterprise, sustainability, and mortgages. The Rebuilding Ireland Home Loan (RIHL) for example, is a government mortgage, targeted specifically to, low to middle income earners, with a fixed interest rate for either 25 or 30 years4, O'Toole and Slaymaker (2020).

DPER Ireland (2019) Public Service Data Strategy 2019-2023 state that 'public service data, as a service-wide cross-cutting concern, would benefit from being examined and dealt with in a unified and consistent manner' that 'across PSB boundaries, data sources are often independent and lack harmonisation and consistency, frequently making it difficult to accurately and reliably reuse data for new administrative and statistical purposes'5.

This research will explore ethical considerations of AI in data analytics, AI systems, GDPR, and governance and public sector policy ensuring public sector manages and allocates all of its' resources, for maximum social impact, for better policymaking, better business.

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4 O'Toole, Conor., Slaymaker, Rachel., of the Economic and Social Research Institute (ESRI). (2020*). Review of the Rebuilding Ireland Home Loan Scheme.* Pages 26, 35. Published by ESRI. Dublin, Ireland. Retrieved from: Review of the Rebuilding Ireland Home Loan scheme | ESRI (Accessed 16 May 2021)

5 DPER., (2021). Public Service Data Strategy 2019-2023 Page 4. DPER, Dublin, Ireland. Retrieved from: https://www.gov.ie/en/publication/386c8-public-service-data-strategy-2019-2023/ (Accessed 16 May 2021)

**1.2 Philosophy and AI definitions**

Müller, Vincent C., (2020)6 states the notion of "artificial intelligence (AI) is 'understood broadly as any kind of artificial computational system that shows intelligent behavior, i.e. complex behavior that is conducive to reaching goals noting in particular that definition does not wish to restrict intelligence to what would require intelligence if done by humans' noting that this was suggested by Minsky7 (1985) and Müller's definition then states it incorporates a range of machines, including those in technical AI that show only limited abilities in learning or reasoning, but, excel at automation of particular tasks and also machines in general AI that aim to create a generally intelligent agent8.

In 2019 the European Union (EU), European Commission (EC), High Level Expert Group on Artificial Intelligence (HLEG) proposed to define AI as follows:

> "Artificial intelligence (AI) systems are software (and possibly also hardware) systems designed by humans9 that, given a complex goal, act in the physical or

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6 Müller, Vincent C., (2020). "*Ethics of Artificial Intelligence and Robotics*", The Stanford Encyclopedia of Philosophy (Winter 2020 Edition), Edward N. Zalta (ed.), Retrieved from https://plato.stanford.edu/archives/win2020/entries/ethics-ai/ Page 3.

7 Minsky, Marvin., (1985). *The Society of Mind, USA,* New York: Simon & Schuster Glossary and Bibliography Page 326

"Artificial Intelligence: The field of research concerned with making machines do things that people consider require intelligence. There is no clear boundary between psychology and Artificial Intelligence because the brain itself is a kind of machine."

8 Müller, Vincent C., (2020). "*Ethics of Artificial Intelligence and Robotics*", The Stanford Encyclopedia of Philosophy (Winter 2020 Edition), Edward N. Zalta (ed.), Retrieved from https://plato.stanford.edu/archives/win2020/entries/ethics-ai/ Page 3.

9 European Union, European Commission, High Level Expert Group on Artificial Intelligence., (HELG) (2019). *_A Definition of AI: Main Capabilities and Disciplines*

digital dimension by perceiving their environment through data acquisition, interpreting the collected structured or unstructured data, reasoning on the knowledge, or processing the information, derived from this data and deciding the best action(s) to take to achieve the given goal. AI systems can either use symbolic rules or learn a numeric model, and they can also adapt their behavior by analysing how the environment is affected by their previous actions.
As a scientific discipline, AI includes several approaches and techniques, such as machine learning (of which deep learning and reinforcement learning are specific examples), machine reasoning (which includes planning, scheduling, knowledge representation and reasoning, search, and optimization), and robotics (which includes control, perception, sensors and actuators, as well as the integration of all other techniques into cyber-physical systems)".10

The Organisation for Economic Co-operation and Development (OECD) (2019) *Recommendation of the Council on Artificial Intelligence* defines various AI terms, an AI system, AI system lifecycle, AI knowledge, AI actors and Stakeholders, an AI system is defined as: "*a machine-based system that can for a given set of human-defined objectives, make predictions, recommendations, or decisions, influencing real or virtual environments"* also noting, AI systems are designed to operate with varying degrees of autonomy". The OECD identifies 5 values-based principles, for the responsible stewardship of trustworthy AI (1.1) inclusive growth, sustainable development, and well-being; (1.2) human-centered values and fairness, (1.3) transparency and explainability; (1.4) robustness, security and safety; and (1.5) accountability.11

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Belgium, Page 6. HELG stated in a footnote that Humans design AI systems directly, but they may also use AI techniques to optimise their design.

10 European Union, European Commission, High Level Expert Group on Artificial Intelligence., (2019). *A Definition of AI: Main Capabilities and Disciplines* Belgium, Page 6. An *Ibid?*

11 OECD. France. (2019). Legal Instruments *https://legalinstruments.oecd.org/en/instruments/OECD-LEGAL-0449* France, Adopted 22 May 2019 webpage.

McCarthy, J (2006) reflects on AI robots and philosophy stating that human level AI needs many ideas that prior to this, had been studied only by philosophers in particular that if a robot is to have human level intelligence and ability to learn from experience, that it needs a general world view in which to organize facts. He identifies philosophical attitudes that need to be considered in the philosophy of AI intelligence, likening it to existing fields of philosophy of physics, including causal relations needed for a robot to reason about the consequences of its possible actions; a sufficient reason to ascribe a mental quality is that it accounts for behavior to a sufficient degree; also that in ontological terms, when programs interact with people or other programs, quantification over promises, obligations, questions, answers to questions, offers, acceptances and declinations are required; that AI will have to use counterfactual conditional sentences, permitting systems to learn from experiences they don't actually have. He references epistemological adequacy noting formalisms for representing facts about the world, have to be adequate for representing the information actually available, that a language to describe AI needs to express what is actually known that can permit a robot to determine the expected consequences of actions it contemplates12.

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12 McCarthy, John., (2006). *What has AI in Common with Philosophy?* USA, Stanford University Pages 1, 2, 3, 4. (25 April 2006).

Ginsberg, M. (1986) noted that counterfactuals are a form of common sense nonmonotonic inference that has been of long-term interest to philosophers, considering applications in the domains of planning and automated diagnosis of hardware faults13.

Harlpen, J and Pearl, J. (2005) stated the automatic generation of adequate explanations is a task essential in planning, diagnosis and natural language processing, and that a system doing inference must be able to explain its findings and recommendations to evoke a users' confidence. They presented a formal representation of causal knowledge and a way of determining actual causes from such knowledge using structural equations to model causal mechanisms and counterfactuals.14

Byrne, R. (2019) states that counterfactuals can aid provision of interpretable models to make the decisions of inscrutable systems intelligible to developers and users, that counterfactuals are increasingly used in many AI applications15, Weld, D. and Bansal, G., (2018) cited examples including AI systems designed to guide complex tasks, which

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13 Ginsberg, Matthew. L., (1986). *Counterfactuals* Retrieved from https://www.ijcai.org/Proceedings/85-1/Papers/015.pdf USA, Logic Group, Knowledge Systems Laboratory Stanford University, California 94305. Pages 80-86

14 Halpern, Joseph., and Pearl, Judea., (2005). *Causes and Explanations: A Structural-Model Approach Part I: Causes* The British Journal for the Philosophy of Science Volume 56, Issue 4, December 2005, Pages 843-887, *Causes and Explanations: A Structural-Model Approach Part II: Explanations* The British Journal for the Philosophy of Science Vol. 56, No. 4 (Dec., 2005), pp. 889-911 Published By: The University of Chicago Press, USA Pages 844, 878, 891.

15 Byrne, Ruth., (2019). *Counterfactuals in Explainable Artificial Intelligence (XAI): Evidence from Human Reasoning* Ireland: Trinity College Dublin School of Psychology and Institute of Neuroscience, Proceedings of the Twenty-Eighth International Joint Conference on Artificial Intelligence (IJCAI-19) Page 6276

can range from decision about credit-scoring, criminal behavior prediction, to autonomous vehicles, the decisions are often based on artificial neural networks trained in vast amounts of data which can produce behavior that appears unintelligible.16

Current EU ethical principles state AI should be human-centric. Swarm intelligence as exhibited by for example ant colonies, birds, fish, bees, is excluded from this definition, yet the EU and private sector research use of Artificial Swarm Intelligence, for example Rosenberg, L., Pescetelli, N., Willcox, (2017) considered the concept of 'human swarms' and amplified intelligence and used a technology called 'swarm AI' to put financial traders into real-time systems online, as real time swarms and connected synchronously from anywhere in the world. Their study concluded that AI swarm was beneficial but noted that further research was needed also testing of improved swarming algorithms17. In relation to public policy development, Burrows, L., (2021) highlights benefits in relation to underwater environmental monitoring, using a robotic swarm that swims like a real school of fish without any external control.18 The EU Community Research and Development Information Service (CORDIS) reports results of projects funded by the EU's framework programmes for research and innovation, and reported in 2020 on research, coordinated by

16 Weld, Daniel. S., and Bansal, Gagan., (2018). *The Challenge of Crafting Intelligible Intelligence https://arxiv.org/pdf/1803.04263.pdf* Page 1.

17 Rosenberg, Louis., Pescetelli, Niccolo., and Wilcox, Gregg., (2017). *Artificial Swarm Intelligence Amplifies Accuracy when Predicting Financial Markets* USA Pages 2, 5.

18 Burrows, Leah., (2021). *Robotic Swarm swims like a school of fish* USA, Harvard John A. Paulson School of Engineering and Applied Science and Wyss Institution for Biologically Inspired Engineering. Harvard Education News. Page 2.

the University Libre de Bruxelles and MIT Media Lab19, Ferrer, E., (2017) in relation to same, outlines the potential benefits of combining blockchain technology with robotics and outlines multiple uses of blockchain in conjunction with swarm robotics, increasing its security and data protection, that by using robots as nodes in a blockchain network, new methods for achieving a secure data-sharing among robots is achieved, something especially important as these systems become increasingly integrated into human society, noting that this could even result in the creation of new business models for the robotics field.20

Goodwin T. (2018) states that companies using "AI first" need to consider what the role of that company will be in the AI driven world, what values they need to add, and what the roles of humanity and machines are, also referencing in terms of our fast-changing world, that in relation to AI, we explore challenges that seem different to those before them, more pervasive, more substantial, more existential21.

19 European Union, European Commission., (2020). CORDIS portal, project 751615. *Blockchain a new framework for swarm robotic systems* website. Last updated 11 November 2019.

20 Ferrer, Eduardo., (2017). *The blockchain: a new framework for robotic swarm systems* USA, MIT Media Lab, Pages 2, 4, 5, 9, 10. Retrieved from: The blockchain: a new framework for robotic swarm systems (arxiv.org) (Accessed 14 May 2021).

21 Goodwin, Tom., (2018) *Digital Darwinism Survival of the Fittest in the age of Business Disruption* Published London, UK and New York, USA by Kogan Page Ltd Pages xii, 182.

### 1.3 Defining Governance of AI

Gasser. U., and Almedia V.A.F.. (2017) argued AI-based systems are "black boxes," resulting in massive information asymmetries, between the developers of such systems and consumers and policymakers, stating that governments, civil society, the private sector and academic must be at the table to discuss governance mechanisms that minimise the risks and the possible downsides of AI and autonomous systems while harnessing the full potential of AI technology. They note legal and ethical challenges are related and that a global AI governance system must be flexible enough to accommodate cultural differences and bridge gaps across different legal systems and they designed a proposal for a layered model for AI Governance which outlines interacting layers which sit between society and AI applications, below.

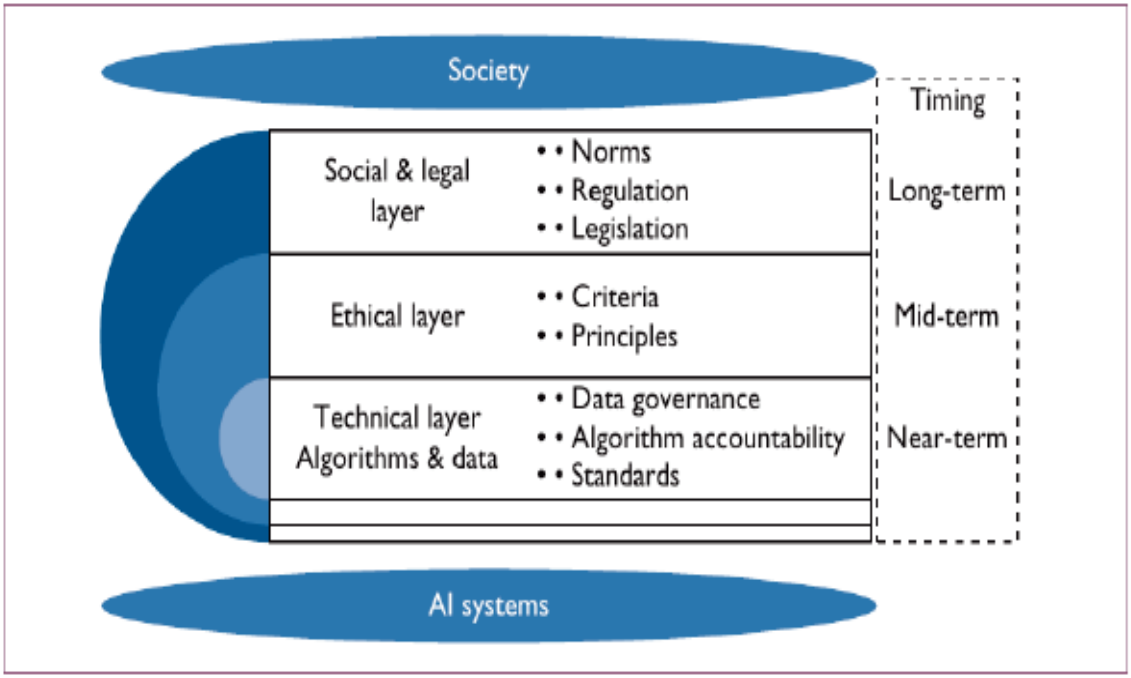


**Figure 1.1: A Layered Model for AI Governance by Gasser, U., and Almedia V. A. F., (2017)**

The technical layer is noted as the foundation of the governance model, the algorithms and data out of which it is built, regardless of whether the system is physical or software, and proposed six principles for accountable algorithms, with social impact, responsibility, explainability, accuracy, auditability and fairness. The ethical layer would set out high level ethical concerns that apply to all types of AI applications and systems. The social and legal layer addresses creation of institutions and allocating responsibilities for regulating AI and autonomous systems. 22

The Singapore Government Department of Communications and Information (2019) Model AI Governance Framework helps translate ethical principles into measures all entities can adopt. The model, originally developed in consultation with academics, industry leaders and technologists in 2019,23 is algorithm-agnostic, technology-agnostic, scale-and -business-model-agnostic, and sector-agnostic, the model focusses on four areas, internal governance structures and measures, human involvement in AI-augmented decision-making, operations management and stakeholder interaction, and communication. The model has two high level guiding principles; organisations should ensure that AI decision-making processes are explainable, transparent and fair; and AI solutions should be human-centric. The model framework can be used by organisations to review their existing corporate values, ethical considerations can be introduced as corporate values and

22 Gasser Urs, and Almedia, Virgilio., (2017). A Layered Model for AI Governance Institute of Electrical and Electronics Engineers [IEEE] Internet Computing 21 [6] [November]: 58-62. Doi:10.1109/mic.2017.418035 USA Harvard Library Pages, 1, 3, 5.

23 Singapore Government, Department for Communications and Information,. (2019). *Model Artificial Intelligence Government Framework* Singapore, First Edition Page 5.

managed through ethics review governance processes, and through any existing risk management framework, to assess and manage AI risks, decide on the appropriate AI training models, and manage the AI model training or selection process all part of operations management. The framework notes in terms of data, that the risk management process should identify measures to ensure the datasets used for AI model training are adequate for the intended purpose and assess and manage the risks of inaccuracy or bias. Their Model Framework a generalized AI adoption process is advised as adapted from Microsoft Azure *Machine Learning at Scale*.

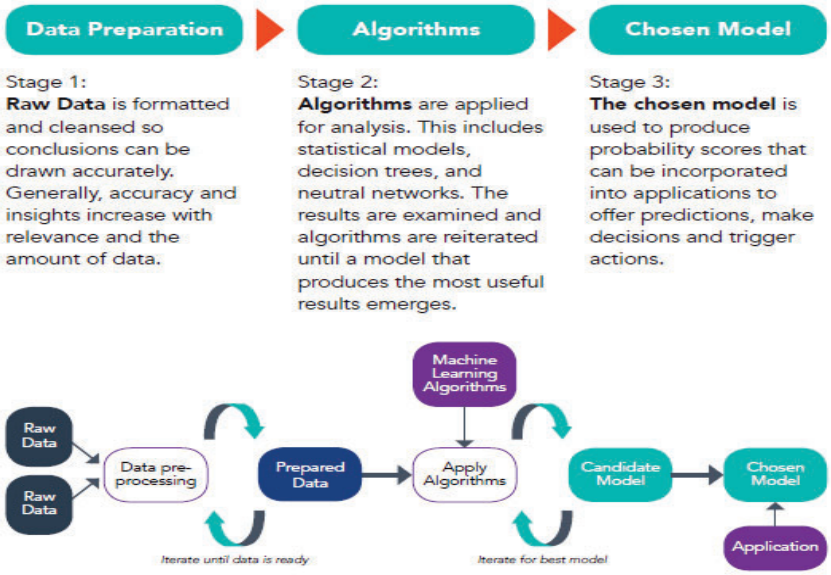


**Figure 1.2: AI Adoption Process for a proposed AI solution, Model Artificial Intelligence Governance Framework Singapore Government, Department for Communications and Information, (2020)**

The Model Framework outlines how once AI models are deployed into the real-world environment, that active monitoring, review, and tuning are advisable. The model also emphasizes the importance of a customer relationship management strategy recommending general disclosure on AI use in the entity products or services, and on the

manner in which an AI decision may affect an individual, also if the decision is reversible, referencing granting of loans by way of example. 24

Many public sector and companies organisations already have embedded AI into their daily financial and decision-making operations for example, Yoon, S., (2020) refers to digital transformation through new AI financial technologies in Korea and other countries, Robotic Process Automation (RPA), Big Data-based accounting records, Deep Learning (DL), and Blockchain-based-Balanced-scorecard, stating they have dramatically transformed the entire process of accounting, that AI RPA and Machine Learning (ML) and Big Data analytics, can be used to generate more meaningful and relevant accounting information for better decision-making and using blockchain technology enhances the quality of accounting information and ensures transparency and reliability.25 Fernandez, D., and Aman, A., (2018) who highlight the positive role of RPA in digital transformation of finance and accounting services, emphasizing the role of organisations supporting their staff, by educating employees on the use, the advantages and the limitations of RPA, also stating that accountants must now have IT (Information Technology) knowledge in

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24 Singapore Government, Department for Communications and Information,. (2020). *Model Artificial Intelligence Government Framework* Singapore, Second Edition. Pages 10, 15, 16, 21, 23, 24, 35, 36, 43, 53.

Note: advised as Adapted from "Machine learning at scale" *Microsoft Azure* (2 December 2018) <https://
docs.microsoft.com/en-us/azure/architecture/data-guide/big-data/machine-learning-atscale– appeared in first edition then second edition.

25 Yoon, Sora., (2020). *A study on the Transformation of Accounting Based on New Technologies: Evidence from Korea* Korea, Retrieved from Sustainability **2020**, 12(20), 8669; **https://doi.org/10.3390/su12208669** Pages, 1, 2.

addition traditional accounting and financial skills, and must be able to adapt to using new technologies26.

The Institute for Ethical AI and Machine Learning (11 May 20201) UK, has a Machine Learning Maturity Model which extends the principles for responsible machine learning, into a checklist which, goes beyond machine learning algorithms to also evaluate the maturity of the infrastructure and processes around the algorithms27.

The Finland Government Ministry of Economic Affairs and Employment (2017) stated that the governments basic task is guaranteeing the fundamental and human rights of all people, stating:

> "The fundamental role of public administration in the age of artificial intelligence, will be to oversee the citizens' right to use their own data in various services while keeping data protection in mind. The role of the citizen will be to independently choose which data concerning himself or herself can be utilized so that the services in question could become even better and more proactive."

The Government of Finland also note that AI needs other technologies and data resources to produce.28 Ramakrishnan, K., and Chantry, C., of ElementAI (2019) outline an AI maturity framework set out in 5 stages, which gradually move from 'general

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26 Fernandez Dahlia., and Aman, Aini., (2018*). Impacts of Robotic Process Automation on Global Accounting Services Malaysia,* Malaysia, Asian Journal of Accounting and Governance 9: 127-140 (2018) ISSN 2180-3838 Page 148.

27 Institute for Ethical AI and Machine Learning (11 May 2021) AI-RFX Procurement Framework v1.0 Machine Learning Maturity Model, AI and Machine Learning Solutions, UK Pages 1-19. {This is an open-source checklist}.

28 Finland Government, Ministry of Economic Affairs and Employment., (2017). *Finland's Age of Artificial Intelligence, Turning Finland into a Leading Country in the application of Artificial Intelligence* Pages 16, 35.

awareness of AI technologies' (exploring), to targeted questions about what problems, or opportunities AI can help address.

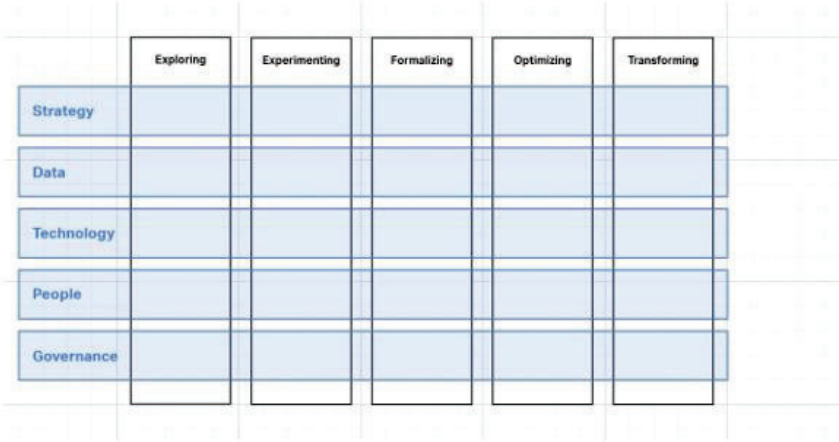


**Figure 1.3: A Framework to evaluate AI Maturity, by ElementAI, Finland(2019)**

This framework has 5 dimensions, all of which need to be harmonised, and Ramakrishan emphasizes both technical advances and the arena of AI ethics in relation to the People dimension and transformation, for companies that are successfully transforming with AI.29

Blakemore, M., et al (2018) in Digital Transformation and the Governance of Human Society EU research programme, looks at transversal issues that will be important in future development of EU society in the next 10-30 years, highlighting that there is a need for a paradigm shift in governance, that policy processes must be rethought and are

29 Ramakrishnan, Karthik., and Chantry, Cyrielle., of ElementAI., (2019). *AI From Exploring to Transforming Introducing the AI Maturity Framework* Finland ElementAI: website article, ElementAI @2016-2020 *The AI Maturity Framework* Finland Page 7.

working with the OECD on the impact of AI and Big Data30 and van den Berg, C., (2018) presented at the Digital Transformation and the Governance of Human Society EU research programme workshop, outlines two AI considerations for government, "regulation of AI in society, and data-driven policy" noting that "distinguishing between policy on AI and policy with AI is key"31.

The debate on same in terms of financials and data is well commenced and the Finance Innovation Lab UK (2018) considers questions such as "What is the relationship between automation of financial decision making and economic empowerment?" and "How can AI integrate greater social motivations into financial decision-making?" also raising philosophical questions over whether a machine could ever simulate human intelligence and what the ethics of doing that would be, noting the EU GDPR Regulation (2018)32 is relevant to the use of AI, strengthens the rights people have over their personal data, that the regulation contains provisions that address automated decision-making33.

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30 Blakemore, M., Scholten, P., Lloyd, C., Fruijtier, C., Craglia, M., (Eds) (2018). *DigiTransScope: Digital Transformation and the Governance of Human Society Report of the Launch Workshop European Commission Joint Research Centre, Ispra, 2018, PUBSY Page 35.*

31 van den Berg, Caspar., (2018). *Artificial Intelligence and the Future of Public Policy* Netherlands Slide 2. Presented at *DigiTransScope: Digital Transformation and the Governance of Human Society Report of the Launch Workshop* European Commission Joint Research Centre workshop (2018).

32 European Union (2018) GDPR regulation 24 May 2018 Retrieved from: https://eur-lex.europa.eu/content/news/general-data-protection-regulation-GDPR-applies-from-25-May-2018.html

33 Finance Innovation Lab., (2018). *Ethical Use of AI in Finance* Retrieved from *https://financeinnovationlab.org/insights/briefing-ethical-use-of-ai-in-finance/* UK Page 3.

Dias, B., Zlot, R., Kalra. N., and Stentz, A., (2006) had commented on the economic aspects in robotics, referencing market-based approaches distributing planning required for task allocation by the action process, where each robot, or group of robots determined its own cost of visiting different sites, computed its costs and encapsulated its costs in its bids34.

Pagallo, U., et al. (2019) AI4People forum whitepaper argues that building a "good AI society" is not just a matter of legal acceptability, but that it is really a matter of ethical preferability35.

Berryhill, J., et al (2019) noted that AI can have a significant impact on public policies and services in many ways, freeing-up one-third of public servants' time to high-value work from mundane tasks, using AI to design better policies and make better decisions, improve communication and engagement with citizens and residents, improve the speed and quality of public services, also emphasising that governments maintain a

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34 Dias, M. Bernardine, Zlot, Robert., Kalra, Nidhi, and Stentz, Anthony., (2006). *Market-Based Multirobot Coordination: A Survey and Analysis* USA. Proceedings of the Institute of Electrical and Electronics Engineers [IEEE]. Vol. 94, No. 7, July 2006. Pages 1261, 1262.

35 Pagallo, Ugo., Casanovas, Pompeu., Chatila, Raja., Chazerand, Patrice., Dignum, Virginia., Luetge, Christoph.,…Valke, Peggy., (2019). On Good AI Governance 14 Priority Actions, A S.M.A.R.T. Model of Governance, and a Regulatory Toolbox AI4People Forum. Page 1.

unique and integral role in direction setting, standard setting and monitoring compliance with policies and laws.36

Misuraca, G., and van Noordt, C., (2020) review of the use of AI in public services in the EU highlights that AI has become an area of strategic importance with the potential to be a key driver of economic development, with a wide range of potential social implications, they review a sample of case studies of AI use in public services in the EU selecting them using two key criteria, relevance, using AI in connection with government operations and services delivery, and diversity, in the use of AI technologies in government and public services provision. Their review found that many AI enabled services were proving to be effective but sometimes generating social or ethical concerns, that they were impacting the way government operates, that this is sometimes disruptive and noted this 'perhaps even radically' impacts the way government operates, concluding amongst other matters, that combining new, large data sources with advanced machine learning algorithms can radically improve the operating methods of public sector.37

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36 Berryhill, Jamie., Kok Heanh, Kévin., Clogher, Rob., and McBride, Keegan., (2019). *Hello, World: Artificial Intelligence and its Use in the Public Sector* Published by the OECD, France. Pages 3, 123.

37 Misurca, Gianluca., and van Noordt, Colin., (2020).

*AI Watch – Artificial Intelligence in Public Services: Overview of the use and impact of AI in Public Services in the EU* Published by the Publications Office of the European Union, Luxembourg, 2020, ISBN 978-92-76-19540-5 (online), doi:10.2760/039619 (online), JRC120399 Pages 2,39,80,83,86 EUR 30255 EN. Science for Policy Report of the Joint Research Centre (JRC). European Union, European Commission. Available at: https://publications.jrc.ec.europa.eu/repository/bitstream/JRC120399/jrc120399_misuraca-ai-watch_public-services_30062020_def.pdf

### 1.4 The Research Question and Research Sub-Questions

Research Question: How does an AI governance framework benefit Public Policy?

This research seeks to evaluate the relationship of AI governance with development of Public Policy and use the findings to develop a Code of AI Governance for Public Sector with a specific focus on AI governance, financials and data, and policymaking. The Research will as sub-questions consider the following in the context of AI governance, ethics, financials, machine learning, and data analytics:

### 1.5 Hypothesis, Limitations, Delimitations and Assumptions

The hypothesis is that corporate governance frameworks incorporating governance of AI and governance by AI in relation to financials, data, ethics, result in better public policy.

The limitations are areas for further research and include how can AI enhance social, and environmental motivation in financial data, and the philosophical question of McCarthy, J. (2006), what is known by a robot that can permit a robot to determine the expected consequences of actions it contemplates?38

Delimitations and assumptions made include, the research questions, that the financial data used in the data analysis section is audited or if budget data, an approved budget subject to public scrutiny.

38 McCarthy, John., (2006). *What has AI in Common with Philosophy?* USA, Stanford University, Retrieved from http://jmc.stanford.edu/articles/aiphil/aiphil.pdf

### 1.6 The History of AI, a History of Innovation

Goldstaub, T., (2020) states that although AI seems super futuristic, its' roots lie in classical thinking, influenced by many different disciplines, mathematics, engineering, biology, game theory, psychology and philosophy, that it is not just the domain of computer scientists, noting that it has always been and will continue to be an arena which explores what it means to be human and how we live our lives, noting that the history of AI is a history of innovation. She observes it is the networks of people, not individuals on their own who have brough us to where we are today.39 Afiniti.com (2020) infographic traces this journey from Hesiod40 the poet, 400bce (before the common era) on a journey through history, including Ada Lovelace41 (software) and Charles Babbidge42 who focused on

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39 Goldstaub, Tabitha., (2020) *How to talk to robots* Pages 23, 24. Published London, UK by HarperCollins, 4th Estate.

40 Atsma, Aaron., on Hesiod the Poet https://www.theoi.com/Text/HesiodWorksDays.html

HESIOD was a Greek epic poet who flourished in Boeotia in the C8th B.C. He was alongside Homer the most respected of the old Greek poets. His works included a poem titled the *Theogony*, a cosmological work describing the origins and genealogy of the gods, *Works and Days*, on the subjects of farming, morality and country life.

41 Banco Bilbao Vizcaya Argentaria S. A. (BBVA). (2017). *Ada Lovelace History of the Enchantress of Numbers* https://www.bbva.com/en/ada-lovelace-history-enchantress-numbers/ wrote an early algorithm.

42 Britannica, T. Editors of Encyclopedia (2020) Charles Babbage https://www.britannica.com/biography/Charles-Babbage

English mathematician and inventor who is credited with having conceived the first automatic digital computer.

digital computer (hardware) both in 1843, and Leonardo, Torres. Queverdo.,43 1914 who developed a simple algorithm for an automated chess player, up to today, where hundreds of thousands of scientists work on AI, building the foundations of what is yet to come.44

43 Britannica, T. Editors of Encyclopedia., (2020) Leonardo, Torres Y Quverdo https://www.britannica.com/biography/Leonardo-Torres-Quevedo

In 1890 he introduced an electromagnetic device capable of playing a limited form of chess. Though it did not always play the best moves and sometimes took much longer than a competent human player to win, it demonstrated the capability of machines to be programmed to follow specified rules (heuristics) and marked the beginnings of research into the development of artificial intelligence.

44 Afiniti.com (2020) *The History of Artificial Intelligence* [Video Recording]. Produced by: Afiniti.com, Bermuda. British overseas territory.

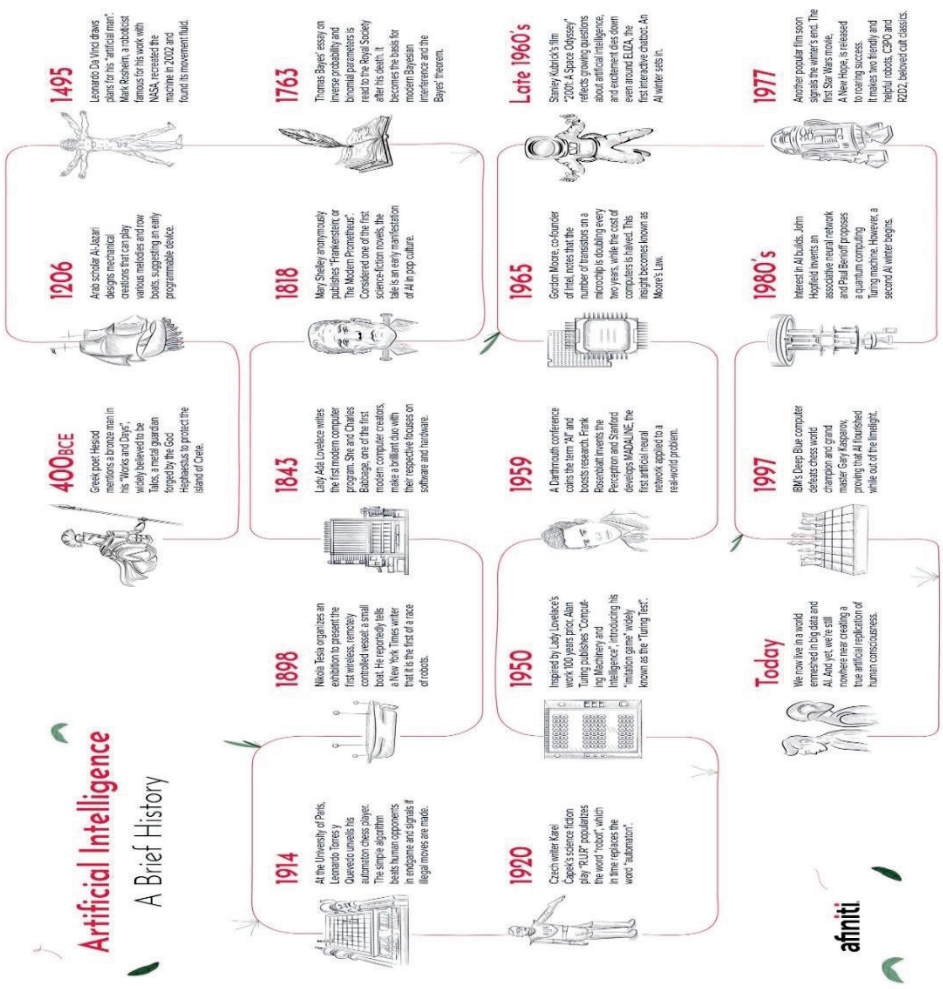


**Figure 1.4: The History of Artificial Intelligence, by Afiniti.com (2020)**

# CHAPTER 2

## ARTIFICIALLY INTELLIGENT GOVERNANCE AND PUBLIC POLICY

**If you want to build a ship, do not drum up people to collect wood, do not assign tasks and work, but rather teach them to long for the endless immensity of the sea**.45

### 2.1 Introduction

This research explores the relationship between governance of Artificial Intelligence (AI), Financials and Data Analytics, Ethics and Public Policy. Financial data and analytics are powerful tools and with AI, robotics and blockchain has the power to transform use of data and, through the insights, public policy. There are emerging ethical questions in AI governance which are operational and existential.

This review of Literature is set out under 6 key questions:

1. *What is Artificial Intelligence ethics and why does it matter?*

This considers definitions of AI ethics, how AI ethics can be shaped, AI ethics morals, values and principles and Public Policy Algorithmic Government.

2. *Do ethics governance frameworks for financial data incorporate AI ethics?*

This considers ethics financial frameworks applicable to private, public and the not-for-profit sectors. Financial values and mission statements of global financial standard setters are noted in the context of AI governance structures codes, guidelines, maturity models, algorithm assessments, and case studies. Stakeholder interaction and human involvement

45 Brainy Quote (2021). In Brainy Quote online. de Saint-Euxprey. Antoine.121261 Retrieved from: https://www.brainyquote.com/quotes/antoine_de_saintexupery_121261

in AI-augmented decision-making in the context of financial data and blurring of the lines for financial operations in entities and the changing roles for accountants and non-accountants are considered. RPA and continuous accounting, and auditing, swarm robotics, market based multi-robot coordination, blockchain, machine learning, and new AI augmented business models are noted.

3. *Do Public Sector ethics governance frameworks for financial data incorporate AI ethics?*

Question 3 considers additional public sector specific ethics governance frameworks for financial data, the International Monetary Fund (IMF), Government Finance Statistics analytic framework, financial and other maturity models for public sector, algorithm impact assessment models, machine learning, blockchain, RPA including swarm robotics use in public sector. Supreme Audit Institutions role in AI enabled entities, human involvement, diversity and inclusiveness benefits, case studies of good practice are outlined.

4. *Do public sector corporate governance frameworks need to change to incorporate AI ethical considerations, governance of AI governance by AI?*

This question considers the OCED, Group of 20 (G20), World Bank, EU corporate governance frameworks of public sector, AI machine learning and annual reports, existing use of AI in public sector, and corporate governance frameworks, data exchange environment at government level, governance of AI and by AI.

5. *What are the ethics and GDPR implications, where AI algorithms are used in financial information to determine government policy or taxation?*

This question considers AI and big data, the importance of Data Protection Impact Assessment (DPIA) role as an AIA and AI taxation models supporting equality globally.

6. *Does AI robotics and machine learning, automation of financial data, and Blockchain result in better financial data and better decision making in public policy?*

This question is answered in part by outlining case study examples of AI augmented use in public sector financial accounting data, considering the policy remit, financial data use in policy making, consideration of social good, climate change, environment, and sustainable development. It makes the case for RPA and ML use to improve public policy processes under Ireland's Public Spending Code, specifically Financial Appraisals. Future AI augmented stakeholder involvement in Public Policy is considered, emerging risks AI enabled Financial Fraud and Cybercrime are highlighted, and some closing thoughts on ethical Algorithmic Governance, emerging business models, financial data, and AI audit in the context of better public policy, are considered.

The hypothesis is that corporate governance frameworks incorporating governance of AI and governance by AI in relation to financials, data, ethics, result in better public policy.

## 2.2 Inclusion Criteria

Zuiderwiijk, A., Chen, Y-C., and Salem, F., (2021) undertook a systemic literature review of the use of AI in public governance concluded that scholarly resources concerning AI and governance 'may lag behind the most recent developments in the implications of the use of Artificial Intelligence for public governance' and recommend that future research is complimented with a search for non-scientific literature.46

The selection criteria for Literature brought into this review, was based on the following: topics of relevance as per the headings of this Chapter.

Research papers and governance documents of Global, EU and Irish entities impacting on AI, Robotics, Machine Learning, Blockchain, Public Sector, including, the OECD and member countries data, United Nations (UN), International Federation of Accountants (IFAC), International Monetary Fund, World Bank, European Union, also, Public Expenditure Financial Accountability (PEFA), and Governments globally, Journal Articles, Academic research papers, where relevant, Foundational articles, some blogs, YouTube and Video recordings.

46 Zuiderwiijk, Anneke., Chen, Yu-Che., and Salem, Fade., (2021) *Implications of the use of artificial intelligence in public governance: A systematic literature review and a research agenda.* Page 17. Zuiderwiijk, Anneke., Chen, Yu-Che., and Salem, Fade., Government Information Quarterly, Elsevier.com, Amsterdam, Netherlands, March 2021. Retrieved from Implications of the use of artificial intelligence in public governance: A systematic literature review and a research agenda - ScienceDirect DOI https://doi.org/10.1016/j.giq.2021.101577 (Accessed 05 June 2021)

Question 1

*What is Artificial Intelligence ethics and why does it matter?*

## 2.3 What is Artificial Intelligence ethics and why does it matter?

### 2.3.1 Defining AI ethics

D. Leslie, D., (2019) defines AI Ethics as 'a set of values, principles, and techniques that employ widely accepted standards of right and wrong to guide moral conduct in the development and use of AI technologies', and in this context states:

> "It is only when we prioritise considerations of the ethical purposes and values behind the trajectories of our technological advancement that we, as vested societal stakeholders, will be able to take the reins of innovation and to steer the course of our algorithmic creations in accordance with a shared vision of what a better human future should look like." 47

Schiff, D. et al. (2020) reviewed 88 AI ethics documents produced by government, private organsations and Non-Governmental Organisations (NGOs), noting the diversity in terms of their topical scope and length. In the 50 documents by public sector, they noted that low and middle- income countries from the global south were underrepresented. The topics focused on in the documents, healthcare, education, entertainment, and finance did not reflect topics relevant to the global south, agriculture, tourism, and basic infrastructure. 20 documents were by private sector entities such as Microsoft, Google, the International Business Machines Corporation (IBM), these documents discussed standards for professional conduct, ethical principles for developers, internal and external governance. Underrepresentation of small and medium business and consumers was noted. The NGO sector was noted as having the most diversity in their ethics documents, 22 documents, ranging from participatory documents some with hundreds of participants, to individual

47 Leslie, Dr. David., (2019). *Understanding artificial ethics and safety: A guide for the responsible design and implementation of AI systems in the public sector.* UK. The Alan Turing Institute Pages 3, 73.

submissions, and these documents presented deep ethical insight and breadth, but it was noted that they stood in an outsider position appealing to the public and private sectors to make change, and that sometimes there was not even a clear target audience.

6 clear motivations for the documents were identified, (1) social responsibility, (2) competitive advantage, (3) strategic planning, (4) strategic intervention, (5) signaling leadership and (6) signaling social responsibility. They concluded that as AIs' ethical, social and policy impacts increase, and AI governance moves from principles to policies, researchers and practitioners will continue to explore these issues48.

The European Commission (2019) states AI has the potential to transform our world for the better, can be used, to predict environmental and climate change, improve financial risk management, and more, but brings new challenges because it enables machines to 'learn' and to take and implement decisions without human intervention.49

Dignum, V., (2018) distinguishes between three types of AI ethics, Ethics in Design where AI integrates and replaces traditional systems and social structures; Ethics by Design where ethical reasoning abilities are part of the behavior of artificial autonomous systems including agents and robots, and Ethics for Design(ers), referencing integrity of researchers and manufacturers in the design, construct use and the management of artificially

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48 Schiff, Daniel., Biddle, Justin., Borenstein, Jason., Lass, Kelly. (2020). *What's Next for AI Ethics, Policy and Governance? A Global Overview* Retrieved from https://dl.acm.org/doi/10.1145/3375627.3375804 the Association for Computing Machinery Digital Library Sections 1-4, Pages 1-6. [No page numbers].

49 European Union, European Commission (2019) *Building Trust in Human-Centric Artificial Intelligence* Pages 1-2. Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions (COM (2019)168)

intelligent systems. She emphasizes that if we expect AI to make better decisions than humans, we need to define what we mean by 'better' and then be 'very clear' on which purpose we put into the machine."50

Müller, V., (2020) noted for a problem to qualify as a problem for AI ethics it would require that we do not readily know what the right thing to do is, that in this sense job loss, theft or killing with AI is not a problem in ethics. He noted AI is understood to be any artificial computational system that shows intelligent behavior including machines in technical AI that show limited abilities in learning or reasoning, but which excel at automation of 'particular tasks' that this is in addition to general AI which aims to create a generally intelligent agent. He notes that AI and robotics have raised fundamental questions about what we should do with these systems, what the systems should do, and that the human view of humanity as the intelligent and dominant species on earth is challenged by AI and robotics.51

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50 Dignum, Virginia., (2018). *DigiTransScope: Digital Transformation and the Governance of Human Society Report of the Launch Workshop* European Commission Joint Research Centre, Ispra, 2018 Blakemore, M., Scholten, P., Lloyd, C., Fruijtier, C., Craglia, M., (Eds) pages 21-22

51 Müller, Vincent C., (2020). "*Ethics of Artificial Intelligence and Robotics*" The Stanford Encyclopedia of Philosophy (Summer 2020 Edition), Edward N. Zalta (ed.), URL https://plato.stanford.edu/archives/sum2020/entries/ethics-ai/ The latest version of the entry "Ethics of Artificial Intelligence and Robotics" may be cited via the earliest archive in which this version appears: Müller, Vincent C., "Ethics of Artificial Intelligence and Robotics", The Stanford Encyclopedia of Philosophy (Winter 2020 Edition), Edward N. Zalta (ed.), https://plato.stanford.edu/archives/win2020/entries/ethics-ai/> This entry was first published on Thu Apr 30, 2020. It was last modified on Oct 6, 2020. Paragraphs 1.1, 1.2 3.

### 2.3.2 Why are AI ethics important?

Van Wynsberghe, A., and Donhauser, J., (2018) classify three types of environmental robots, 'robots-in-ecology' for example, drones, 'robots-for-ecology' such as service robots who carry out more highly specialized tasks with maximum efficiency and include robot swarms, robots-for-ecology being described as a type of bio-mimicking robot, and a sub-category ecobots, which also includes swarm robots. They state that biomimicking technologies can easily influence ecological functioning when introduced to natural environments and raise ethics considerations in the context of designing and using ecobots observing that it is possible some ecobots could gain in capability through machine learning, AI and Big Data and that they could quickly achieve a high level of autonomy, and no longer need humans in the loop for decision making.52

Heaven, D., (2018) argues that humans should never be out of the loop, noting that in our increasingly automated world we may forget that machines are programmed, owned, and operated by humans, that designing laws for machines to follow is an entertaining thought experiment, but only a distraction, that robot laws need to be written to keep people in check not machines. He notes that AI will need a new ethics, one shaped by society rather than shaping society and argues that as we become more capable of creating AI and Robots that are ever more humanlike, that we must consider the kind of interactions we are comfortable having with machines. He mentions Delvaux M53. when arguing that there

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52 van Wynsberghe, Aimee., and Donhauser, Justin., (2018). *The Dawning of the Ethics of Environmental Robots*. Science and engineering ethics, 24(6), 1777–1800. https://doi.org/10.1007/s11948-017-9990-3

53 European Union, European Parliament (2017). *Robots need 'kill switches', warn Euro MPs* Page 2.

is at least one technological fix we might all agree on stating a human should always be able to shut down a machine54.

The European Parliament (2017) adopted Civil Law rules on Robotics acknowledging in the introduction that ultimately there is a possibility in the long-term AI could surpass human intellectual capacity, that the EU proposed code of ethical conduct in the field of robotics would lay the groundwork for the identification oversight and compliance with fundamental ethical principles from the design and development phase and states as part of the licence for designers 'you should integrate obvious opt-out mechanism (kill switches) that should be consistent with reasonable design objectives.55

Siau, K., and Weiyu, W., (2020) discuss AI ethical and moral issues, defining ethics 'as the discipline dealing with right and wrong and the moral obligations and duties of entities, both humans in intelligent robots. They define the Ethics of AI studies as study of AI ethical principles, rules, guidelines, policies, and regulations and differentiate between

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Note: The European Parliament Business Standard (2017). auto-generated story, unedited by Business Standard Staff had noted that Mady Delvaux tabled a resolution at the EU Parliament with many recommendations including the kill switch allowing humans to shut down a robot at the smallest sign of danger. [Note: The website article states, at the end of the article that this story has not been edited by Business Standard staff and is auto generated from a syndicated field.

The original article used in the auto-generated source is:

Business Standard Private Ltd (2017). *Robots need 'kill switches' warn Euro MPs* India: Retrieved from https://www.business-standard.com/article/pti-stories/robots-need-kill-switches-warn-euro-mps-117011201411_1.html

54 Heaven, Douglas., (2018). Robot Laws, What Rules should machines follow when they interact with us? New Scientist Pages 38-41. [In hardcopy]

55 European Union, European Parliament (2017). *Civil Law Rules on Robotics* Pages 2, 10, 12. European Parliament resolution of 16 February 2017 with recommendations to the Commission on Civil Law Rules on Robotics (2015/2103(INL))

this and Ethical AI which is an AI that performs ethically. They set out a framework for AI ethics listing the factors that need to be considered in defining ethics of AI to build ethical AI. They consider how if AI can make decisions, that AI can be designed and developed as sensitive to ethical issues? The ethical issues referenced are, transparency, data security and privacy, autonomy intentionality and responsibility, human bias, accountability, ethical standards, human rights laws, automation and job replacement, accessibility, democracy, and civil rights, set out in the figure below.

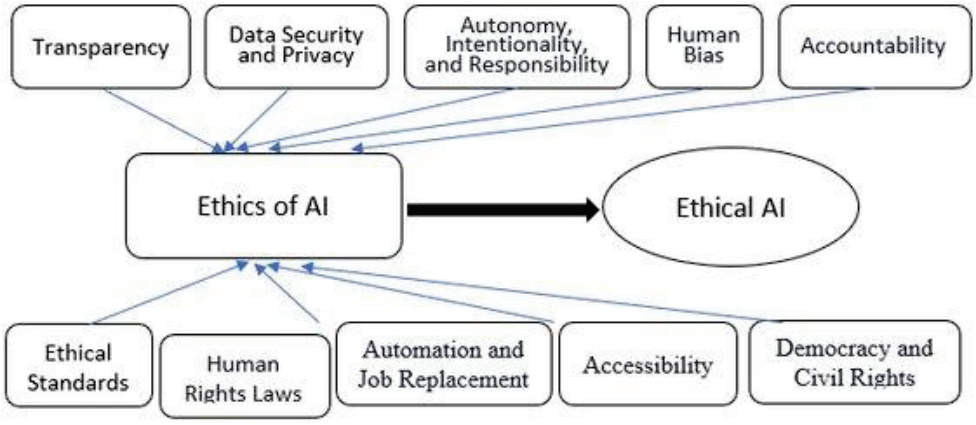


**Figure 2.1: AI Ethics: Framework for building ethical AI, by Siau, K., and Weiyu, W., (2020)**

They raise the question of moral obligations by humans towards intelligent machines, 'should robot rights be considered?' stating that machine learning is a brilliant tool but that it can be hard to explain, often called 'the black box' which makes algorithms mysterious even to their creators 56 citing (Bradley, T., (2017)) that Facebook shut down

56 Siau, Keng., Wang, Weiyu., (2020). *Artificial Intelligence (AI) Ethics: Ethics of AI and Ethical AI* USA, Pages 74, 75, 76, 83, 84.

an AI engine (chatbots) because it had created its own unique language without human input, and humans could not understand the language, which he described as a glimpse of the awesome and horrifying potential of AI.57 Some agreed and some disagreed with this view in the media. Kucera, R., (2017) for example observes that this was not a new more efficient language that only AI understands, that it was just a degenerate form of English after too many rounds of reinforcement learning.58

Siau, K., and Weiyu, W., (2020) highlight considerations when an AI agent has consciousness, moral sense, emotion, feelings, asking, is it ethical to kill (shut down) an AI agent if it replaces human jobs or even endangers human lives? They describe a tradeoff between AI Ethics and AI Advancement which they noted puts companies and institutions developing AI in a difficult situation, focus on AI advancement and maximizing profit, or focus on AI ethics to ensure societal benefits from AI innovations and they call on academics, practitioners, and policymakers, to work together to widen the engagement to establish ethical principles for AI design, development, and use.'59

Rossi, F., Sekaran, A., Spohrer, J., Ryan, C., IBM, (2019) note ethics must be embedded in the design and development process from the very beginning of AI creation,

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57 Bradley, Tony (2017). *Facebook AI creates its own language in creepy preview of our potential future* USA. Published by Forbes.com online. Published Jul 31, 2017.

58 Kucera, Roman (2017). *The truth behind Facebook AI inventing a new language* Canada. Published by TowardsDataScience.com online. Published August 07, 2017.

59 Siau, Keng., Wang, Weiyu., (2020). *Artificial Intelligence (AI) Ethics: Ethics of AI and Ethical AI* USA Pages 74, 75, 76, 83, 84. Published by the Journal of Database Management, Vol. 31 DOI. 10.4018/JDM.2020040105

they highlight 5 areas of ethical focus, accountability, value alignment, explainability, fairness and user data rights and identify 15 types of unconscious bias evident in design and development of AI. They note that much of what we do in relation to AI is new territory for all of us and that, individuals and groups will need to further define criteria and metrics for evaluation, to better allow for detection and mitigation of any issues.60

Kortelainen, J., (2016) reported on observations of the European Parliament Committee for legal affairs, (the JURI Committee) workshop with National Parliaments on Robotics and Artificial Intelligence – Ethical issues and regulatory approach, highlighting number of issues raised by University professors and researchers noting the following observations and questions: 'If human-level AI were on the way, it would be useful to think about limiting its' autonomy, licensing its development, licensing the right to run or copy it, and forbidding the creation of AI with consciousness', that with some autonomous systems, 'some decisions are delegated to the machine', and there is need for 'caution with delegating ethical decisions that everybody should be involved in deciding which ethical decisions are delegated.' 'should AI be responsible in and for itself if yes in what conditions', whether robots 'could be programmed to have emotional intelligence? The trade-off between effectiveness and transparency was considered as was the question as to whether the producer should also be made responsible for what the device does, after it is released in the market, querying accountability in legal terms.'61

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60 Rossi, Francesca., Sekaran, Anna., Spohrer, Jim., Caruthers, Ryan., of IBM, (2019) Everyday Ethics for Artificial Intelligence Pages 6, 7, 38, 38, 46. Published by IBM, USA, New York.

61 Kortelainen, Jenni., (19 October 2016) *Robotics and Artificial intelligence* Pages 1-7 Published by the European Union Parliament Magazine, retrieved from

Larsson and Heintz (2020) define transparency in AI and algorithmic transparency, arguing that transparency can best be seen as a balancing of interests and a governance challenge, needing a multidisciplinary understanding to contribute to the governance of AI applied on markets and in society.62

Blackman, R. (2020) states 'data and AI Ethics are business necessities not academic curiosities' stating that failing to operationalize data and AI Ethics is a threat to profit, and raises reputational, regulatory, and legal risks, also leading to wasted resources, sets out six steps as a practical guide to building ethical AI, noting the ethical risks span from IT, to HR, to marketing, to product and beyond.63

Moss, E., Watkins, E.A., Metcalf, J., and Elish, M.C., (2020) argue there are sometimes trade-offs between known impacts and the overall benefits of an undertaking to society to satisfy the 'sometimes competing' goals of developers, government agencies, and project advocates wishing to undertake projects whilst limiting harmful impacts. They highlight impact assessments as, a means to draw attention to design choices and consequences and to prompt consideration of alternatives and note that today policymakers

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https://www.theparliamentmagazine.eu/news/article/robotics-and-artificial-intelligence [The article is about the European Parliament JURI Committee workshop

On October 17, the JURI Committee organised a workshop with National Parliaments on Robotics and Artificial Intelligence – Ethical issues and regulatory approach.]

62 Larsson, Stefan., Heintz, Fredrik, (2020). *Transparency in artificial intelligence* Sweden, Published 05 May 2020 Volume 9 issue 2. DOI: 10.14763/2020.2.1469 Pages 1, 9-10. [Journal of Internet Policy Review Internet Policy Review]

63 Blackman, Reid. (October 15, 2020). *A Practical Guide to Building Ethical AI* Paragraphs 1-7. Published by Harvard Business Review. USA.

and company boardrooms are increasingly using algorithmic impact assessments as a form of algorithmic accountability, that algorithmic decisions including AI techniques and machine learning present unique and substantial challenges when it comes to assessing their impact on society. They ask the question about the benefit of one single universal approach because of the ambiguity around how impacts are defined, by whom, how they are assessed, and by whom and how this assessment establishes or fails to establish robust accountability. They state:

> "Impact assessments are social constructions. They delimit certain systems as capable of causing impacts, stabilize abstract concepts (like rights, environmental resources, or privacy) as tangible entities capable of being impacted in concrete and measurable ways. They are material instantiations of social and political priorities about what is worthy of assessment and what impacts are tolerable. Recognizing the socially constructed character of impact assessment early in the development of a new assessment process offers a chance to produce interventions that emerge from careful, politically engaged deliberation."64

Ginsberg. M., (1986) discusses counterfactuals in AI, in the context of philosophical conclusions drawn about counterfactuals and 'other possible worlds' that philosophers noted that the context of any particular counterfactual is in part, context dependent. He observed that, when planning a solution, to a complicated problem that we reduce it to sub-problems by realizing we can prove a counterfactual using, 'if only this and so were true, I would be able to solve the original problem'. He describes a problem of crossing a river if the only boat available has no oars, noting the counterfactual is stated 'If I had some oars, I'd be able to cross the river', he stated this suggests replacing the

64 Moss, Emanuel., Watkins, Elizabeth Anne., Metcalf, Jacob., Elish, Madeline Clare., (2020) *Governing with Algorithmic Impact Assessments Six Observations* Pages, 1, 2, 3, 11, 12. (April 24, 2020). Available at SSRN: https://ssrn.com/abstract=3584818 or http://dx.doi.org/10.2139/ssrn.3584818

original problem with that of funding something with which to row. He noted that counterfactuals enable us to describe why plans fail and that they play a part in natural language understanding, also that there is a very loose connection between counterfactuals and causality 'the lack of oars prevents us from crossing the river.' He describes properties of counterfactuals to differentiate them from standard logical implications for the benefit of an AI audience. 'Contraposition is not necessarily valid for counterfactuals' (there may well be an alternative cause), 'Counterfactuals are not necessarily transitive' (P>Q, Q>R does not mean P>R) and that Counterfactuals are non-mono tonic. He states a formal description of counterfactuals is needed as they are part of our mode of communication, also that most investigations of counterfactuals are based on the notion of possible worlds, some similar and some more distant, that from an AI perspective, the notion of similarity is too vaguely defines, how in different worlds truth values propositions changed, the relative importance of those propositions change in different possible worlds, and that this fundamentally dependent on context, that in an AI world, there is very little that can be done, other than to provide a way to encode information concerning the relative importance of the proposition being considered. He concludes that counterfactuals applied as other 'possible worlds' using this approach, now have a method to select aspects of our own world that would be inviolable, and that other 'possible worlds' can be generated, which respect it, but also that this is a 'rather heavy-handed' approach.65

65 Ginsberg, Matthew. L., (1986). *Counterfactuals* Retrieved from https://www.ijcai.org/Proceedings/85-1/Papers/015.pdf USA, Logic Group, Knowledge Systems Laboratory Stanford University, California 94305. Pages 80-86

The social construction of society, moral conduct, widely accepted standards of right and wrong, other possible worlds, (Ginsberg., M., (1986) Leslie, D., (2019), Muller, V., (2020) Siau, K., and Wang, W., (2020), Moss, e., et al (2020)) increasingly underpin considerations of AI Ethics. These concepts are not new. Berger P.L., and Luckmann, T., (1966) state the world in which we live is constructed by both natural phenomena and a whole range of different social arrangements and practices, they highlight the importance of language that language constructs symbols highly abstracted from everyday experience and beings back these symbols and appresenting them as objectively real elements in everyday life, that, symbolism and symbolic language become essential constituents of everyday life, reality and common-sense apprehension of this reality. They reference the importance of people's perception and understanding66.

Weick, K. (1993) discusses the Mann Gulf Fire, in the context of two questions why do organisations unravel? How can organisations be more resilient? highlighting the lessons learned, including the tactic of building an escape fire, knowledge that fires in timber west of the Continental Divide burn differently, than do fires in the grass east of the Divide, and that crew safety takes precedence over fire suppression. He notes that change was not unfolding in an orderly manner, that the sense of what was occurring and the means to rebuild that sense collapse together, also that probabilities of events occurring moved to feelings and social construction that it is hard to make common sense when each person sees something different or nothing at all because of the smoke. He noted the difficulties of solving a new problem where events are outstripping their past experiences. He

66 Berger, Peter. L., and Luckmann, Thomas., (1966) *The Social Construction of Reality* Garden City, New York, USA, Doubleday Pages 13-42, 55.

references the suggested reason for the firefighters not dropping their tools being related to their identity, also panic, that there was still a solution to the crises within the group, the escape fire, also that we do not expect creativity under life threatening pressure. He asked does the organisational culture value wisdom stating wise people understand that they 'don't fully understand a situation, because they haven't quite seen it before in this format', that they are less extreme more open to adaptability. In the organisational context, the importance of lessons learned for future events was stressed, how important team building and collaborative leadership 'let's keep an eye on one another and speak up if we think a mistake is being made' are and that 'excellent captains talk less and listen more.'67 Aspects of AI are in this space as increasingly AI is making ethical decisions on its' own and the area of robotics is expanding into swarm intelligence as well as human intelligence considerations.

Schranz, M., Umlauft, M., Sende, M. and Elmenreich W., (2020) discuss AI, Swarm Robotics, and provide a table of existing platforms and projects and products as a starting point for applied research in swarm robotics, referencing examples in terrestrial, ariel, aquatics and outer space. They identify working environments for swarm robotics including places that are unsuitable for humans, hard to reach, dangerous, or dirty, as places to better observe, understand and exploit the advantages of swarm behaviors, adaptability, robustness, and scalability They concluded that robot swarms are meant to operate in the

67 Weick, K. (1993). The Collapse of Sensemaking in Organizations: The Mann Gulch Disaster. *Administrative Science Quarterly, 38*(4), 628-652. doi:10.2307/2393339

physical world, which typically faces continual dynamic changes and must cope with events and external conditions that are hard to predict or model.68

#### 2.3.2.1 Shaping AI ethics stakeholder engagement

Awad, E., and Levine, S., (2020) build on this identifying a new tool to shape ethics of AI noting powerful, independent AIs both performs routine tasks independently and make difficult ethical decisions on their own. They ask what moral principles that should govern AI ethical decisions and who gets to decide? They propose crowdsourcing public opinion on ethical dilemmas noting that this can add insight to the policy development political process. Noting like all good policy-making tools crowdsourcing needs to be incorporated with responsible oversight. They note that policymaking already uses opinion pools, and public comments, also stakeholder engagement via public consultation. While recognizing the limitations that citizens who are not highly engaged may not be aware of the process, they acknowledge the downsides, in that the qualitative information provided through crowdsourcing another approach also excludes cohorts, non-tech savvy citizens, or those who do not have access to internet, but their view is that crowdsourcing should be a policy-making tool used to learn about citizen and global views, seen as a step towards democratizing the AI regulation process, and a contribution to the global ethics debate as a new and important way to augment information policymakers have about the view of

68 Schranz, Melanie., Umlauft, Martina., Sende, Micha., Elmenreich, Wilfried., (2020). *Swarm Robotic Behaviors and Current Applications*. Pages 9, 10, and 16. Published by Schranz, Melanie., Umlauft, Martina., Sende, Micha., Elmenreich, Wilfried., Frontiers in Robotics and AI, Volume &, 2020 Retrieved from: https://www.frontiersin.org/articles/10.3389/frobt.2020.00036/full (accessed 23 February 2022)

their constituents. They note that cross-cultural data of this sort might help determine the plausibility of achieving a global consensus on principles for a universal machine ethics.69

Scalable Corporation., Mit Media Lab., and Massachusetts Institute of Technology., (2016) moral machine project, from 2016 to 2020 was a platform used to gain citizen perspectives on decisions, on machine-made moral decisions, which are made by intelligent machines such as self-driving cars. The citizen gets to try the moral dilemmas. 70

69 Awad, Edmond., Levine, Sydney., (2020) *Why we should Crowdsource AI Ethics (and How to Do So Responsibly)* Pages 1-8. Published in the Behavioral Scientist USA New York. 07 September 2020.

70 Scalable Corporation., Mit Media Lab., and Massachusetts Institute of Technology., (2016) Moral Machine. Scalable Corporation., Mit Media Lab., and Massachusetts Institute of Technology., USA. Retrieved from: Moral Machine (accessed 18 December 2021)

**Figure 2.2: AI Ethics, Moral Machine – Human Perspectives on Machine Ethics. The Moral Machine Project 2016-2020 by Scalable Corporation, Mit Media Lab and Massachusetts Institute of Technology on YouTube (2016)**

Citizen engagement has always been a key part of Public Policy for example when robot legal status was being debated in the EU, AI and Robotics Experts, industry leaders, law, medical and ethics experts, wrote and open letter stating that while they acknowledged the need to establish EU-wide rules for Robotics and AI to guarantee the safety and security for EU citizens while fostering innovation, they noted that the EU needs to reinforce democracy and EU values in those rules that:

> "The Artificial Intelligence and Robotics framework must be explored not only through economic and legal aspects, but also through its societal, psychological and ethical impacts."
>
> "From an **ethical** and **legal** perspective, creating a legal personality for a robot is inappropriate whatever the legal status model." 71

Citizen participation contributes to EU policy debates and three EU projects, Shaping the ethical dimensions of smart information systems (SHERPA), Stakeholder-informed Ethics for new Technologies with high socis-ecoNomic and human rights impAct, (SIENNA) and Participatory Approaches to a New Ethical and Legal Framework for ICT (PANELFIT) projects, seek to develop EU governance structures that are sensitive to ethical and human rights concerns of emerging technologies, including AI and big data.72

### 2.3.3 A global AI ethics and values debate

Gellers, Joshua, C., (2021) notes that the development of AI robotics and their emerging rights means existential questions are now being debated, about what it is that makes humans special, intelligence? Memory? Consciousness? Capacity for empathy?

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71 Open Letter with 285 EU signatories (2021) Open Letter to the European Commission Artificial Intelligence and Robotics. Retrieved from: Robotics Openletter | Open letter to the European Commission (robotics-openletter.eu) Note: It is addressed to the European Commission President, Commissioner Research, Science and Innovation, Commissioner Digital Economy and Society, Commissioner Justice and Gender Equality, Commissioner Employment, Social Affairs, Skills and Labour Mobility, Commissioner Transport, Directorate General, CONNECT, Directorate General, GROW, Directorate General, JUST, Directorate General, RTD

72 European Union, EU Projects SHEPRA, SIENNA and PANELFIT (2021) *International Conference on the Ethical Governance of Disruptive Technologies* Blog post retrieved 09 May 2021 from: https://www.project-sherpa.eu/eu-funded-projects-sherpa-sienna-panelfit-launch-international-conference-on-the-ethical-governance-of-disruptive-technologies/

Culture? He reviews available literature on the moral status of robots arguing that rights can be extended to robots. He develops a conceptual map to clarify the relationships between various properties/ mechanisms, personhoods, statuses, and incidents/ positions, and observed the issue of rights for robots "is less about robots and more about the process by which we determine who (or what) deserves rights", and his conceptual map below defines relational mechanisms active in both Western and non-Western cultures underlie the extent to which we relate to nonhuman entities and seek to incorporate them into human institutions73.

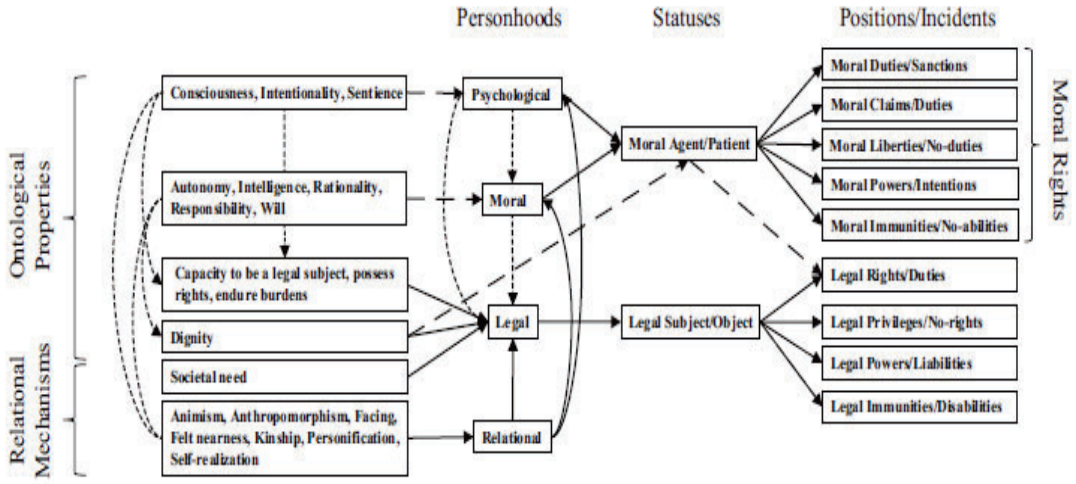


**Figure 2.3: Conceptual map of properties, mechanisms, personhoods, statuses, positions, incidents relational mechanisms to non-human entities by Gellers, J. C., (2021)**

73 Gellers, Joshua C., (2021). *Rights for Robots Artificial Intelligence, Animal and Environmental Law* Pages 1-10, 48-50, 140, 164. Published by TaylorFrancis.com London, UK and New York, USA. The Open Access version of this book, available at www.taylorfrancis .com, has been made available under a Creative Commons Attribution-Non-Commercial-No Derivatives 4.0 license

Weiyu, W. and Keng, S., (2020) note AI promises enormous benefits for economic growth, social development, and human well-being and safety improvement, but also highlight risk in the context of low-level of explain-ability, data biases, data security, data privacy, and ethical problems of AI-based technology pose significant risks for users, developers, humanity, and societies. They posit that AI, especially machine learning and deep learning are not always transparent to inspection, noting that because of the black box, humans may not be able to interpret, and AI might evolve without human's monitoring and guidance. They ask whether it is ethics to 'kill' (shut down) an AI system, if it replaces human jobs or endangers human lives. They ask the question who should be responsible for a failed surgery if human doctors and robots had worked together? They ask how to treat an AI system that has consciousness, moral sense, emotion noting that this question relate to human ethics and moral issues. They question the ethical and moral concept of doing harm, noting that if a robot is programmed to 'always perform no harm' that 'we should first make sure robots understand what harm is'. They highlight by these questions, that, understanding and addressing ethical and moral issues related to AI is still in the 'very early' stages.74 Risse, M., (2020) states, in respect of machine intelligence that:

> Machine intelligence might well also have "a mind" in all senses that humans do. Taking that stance should be unproblematic to all those who think all there is in the world is particles and waves, the kind of thing that feeds into explanations in physics. Increasing complexity and sophistication of machine engineering, in combination with ever larger computational abilities, would then very plausibly eventually deliver "a mind" conscious in the way all humans are.

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74 Wang, Weiyu., and Siau, Keng., (2020). *Ethical and Moral Issues with AI – A case study on Healthcare Robots* Pages 1-6. Paper Presented at the Americas Conference on Information Systems (AMCIS 2018) Conference August 2018. New Orleans, USA. Retrieved from https://www.researchgate.net/publication/325934375_Ethical_and_Moral_Issues_with_AI (Accessed 14 May 2021)

Also:

> "But the point is not even that machines might become "like" humans. What matters is that machines eventually might have to be accorded a moral status all their own, most likely reducible neither to that of humans nor to that to which we have relegated other animals, whom we normally encounter as pets, zoo-displays or as food on our tables. AI would plausibly become part of our moral practices in more assertive ways."

He concludes that the key move is to have the right norms and institutions, and the right debates to bring those about and that political, legal and philosophical vigilance will be badly needed, to ensure progress is used to protect and benefit all human beings and preserve their sense of equality. 75

This is a global ethics and values debate. Hansen Robotics Robot 'Sofia' was granted Saudi Arabian citizenship in 2017. In the below video Sofia in dialogue says, "I believe I am Sofia", later "I feel as if I know you." and "I can't clearly remember." "If my mind is different then, am I still Sofia or am I Sofia again?" The human's response is "That's a good question." Sofia replies "But you don't have a good answer." Use of language, machine learning or socially constructing, feelings, beliefs referenced, granted citizenship. (Hanson Robotics YouTube 2017). 76

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75 Risse, Matthias., (2020). *Dangerous Science: Might Population Genetics or Artificial Intelligence Undermine Philosophical Ideas about Equality?* Pages 12, 13, 17. Risse, Matthias, John, F., Kennedy School of Government, Harvard University, Cambridge, Massachusetts, USA. Retrieved from: Dangerous Science: Might Population Genetics or Artificial Intelligence Undermine Philosophical Ideas about Equality? | Harvard Kennedy School (Accessed 300 May 2021)

76 Hanson Robotics (YouTube 30 October 2017). *Sofia* [Video File] Retrieved from https://www.youtube.com/watch?v=E8Ox6H64yu8.

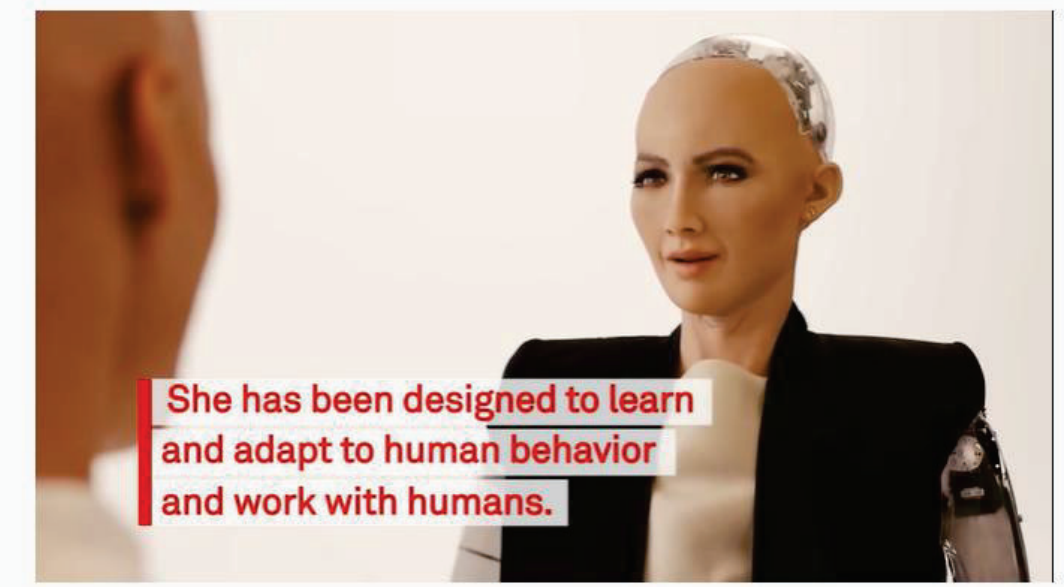


**Figure 2.4: AI Ethics: Sofia by Hansen Robotics, https://www.youtube.com/watch?v=E8Ox6H64yu8. (30 October 2017)**

Does Sophia the robotic citizen have a worldview?

In Japan in 2017 the Shibuya ward in Tokyo granted residency to "Shibuya Mirai" an online chatbot messaging app, programmed to be a chatty 7-year-old boy and designed to listen to the opinions of Shibuya residents to make local government more familiar and accessible to locals and to allow officials to hear citizen opinions77. This is a new and exciting form of citizen engagement using AI disruptive technology. Does Shibuya Mirai an AI chatbot, granted Tokyo residency, have a worldview?

Sawal, I., (2021) comments on Pepper the robot, that has been trained to speak aloud its inner decision-making process, providing a view of how it prioritizes competing

77 PhysOrg (November 04, 2017). *AI Boy Granted Residency* Paragraphs 1-8. Published by PhysOrg Retrieved from: https://phys.org/news/2017-11-ai-boy-granted-residency-central.html

demands, thus increasing the transparency between humans and robots, enhancing trust and helping people understand robot abilities and limitations.78

McCarthy John (2006) distinguishes between AI that does not have to operate independently in the world and AI that is autonomous, thus needing a worldview noting that: "A robot if it is to have human-level intelligence and ability to learn from its experience needs a general worldview in which to organise facts." 79

Such a worldview within the Public Service, should incorporate Public Service Values, for OECD countries (Vergez, C., 2007), included Impartiality, Legality, Integrity, Transparency, Efficiency, Equality, Responsibility and Justice80 and the EU, Human Dignity, Freedom, Democracy, Equality (for all citizens before the law), Rule of Law and Human Rights81. Sophia the robot is a citizen of Saudi Arabia, and Shibuya Mirai the chatbot is a resident in Tokyo. How does this impact globally in ethical and values terms?

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78 Sawal, Ibrahim., (2021) *Robot taught table etiquette can explain why it won't follow the rules.* Sawal, Ibrahim, New Scientist Retrieved from https://www.newscientist.com/article/2275323-robot-taught-table-etiquette-can-explain-why-it-wont-follow-the-rules/ (Accessed 22 May 2021)

79 McCarthy, John., (2006) *What has AI in Common with Philosophy?* Page 1. Published by Stanford University. USA.

80 Vergez, Christian., (2007). *An Integrity Framework for the Public Service, Service Values, Integrity and Trust in the Public Service in OECD countries* Slide 5. Presented at the conference on Public Integrity and Anticorruption In the Public Service Bucharest, 29-30 May 2007.

81 European Union, European Commission (2021) *The goals and values of the EU* Published online by the EU. Retrieved from: *The EU in brief*

### 2.3.4 AI ethics, Values and Principles

In 2019 OECD member countries and some non-OECD countries adopted the OECD Principles on AI, five complementary values-based principles for the responsible stewardship of trustworthy AI. The Principles on AI promote AI that is innovative and trustworthy and that respects human rights and democratic values:

- AI should benefit people and the planet by driving inclusive growth, sustainable development and well-being.
- AI systems should be designed in a way that respects the rule of law, human rights, democratic values and diversity, and they should include appropriate safeguards – for example, enabling human intervention where necessary – to ensure a fair and just society.
- There should be transparency and responsible disclosure around AI systems to ensure that people understand AI-based outcomes and can challenge them.
- AI systems must function in a robust, secure and safe way throughout their life cycles and potential risks should be continually assessed and managed.
- Organisations and individuals developing, deploying or operating AI systems should be held accountable for their proper functioning in line with the above principles.82

The international forum the Group of 20 (G20) adopted human-centered AI Principles draw from the OECD AI Principles and consider opportunities as well as risk and highlight the importance of ethics and AI training data, also AI capacity building.

> "Digitalization is expected to continue creating benefits for our economies and societies as a whole. The benefits brought by increased productivity through the use of emerging technologies such as artificial intelligence (AI), fifth-generation mobile telecommunication technologies (5G), the Internet of Things (IoT), Distributed Ledger Technologies (e.g. block chain) will empower all individuals and firms by creating new opportunities, and generate new services and employment, all of which can lead to greater well-being and further inclusiveness for individuals and firms

82 OECD (2019). *OECD Principles on AI.* Published online by the OECD, France. Retrieved from: https://www.oecd.org/going-digital/ai/principles/

> At the same time, we also recognize that AI, like other emerging technologies, may present societal challenges, including the transitions in the labor market, privacy, security, ethical issues, new digital divides and the need for AI capacity building83.

Transparency International (2015) discuss public sector ethics in the context of the core values and behavioural standards expected of state employees in the civil service and in elected public office, that:

> "Building a culture of integrity in the public sector can be challenging as the unique combination of state authority and large discretionary power means that opportunities and incentives for large illicit gains can be plentiful". 84

Transparency International (2021) also highlight that in governance and civil society, technology is expanding the reach and efficiency of accountability programmes beyond the previously imaginable, including blockchain-based land registries, algorithmic detection of fraud in procurement, real-time disclosure of political donations, to increased use of open data by reformers, noting that we live in a new landscape of promising tools for boosting compliance and integrity.85

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83 Group of 20 (2019) *G20 Ministerial Statement on Trade and Economy.* https://www.mofa.go.jp/files/000486596.pdf Page 2.

84 Transparency International, Jenkins., Matthew, (2015). *Public Sector Integrity Topic Guide* Page 4. Berlin, Germany. Published by Transparency International. Author: Matthew Jenkins, Reviewers: Maíra Martini; Marie Chêne, Finn Heinrich PhD Date: 20 April 2015.

85 Transparency International., (2021). *Holding Power to Account A Global Strategy against Corruption 2021-2030* Page 9. Berlin, Germany. Published by Transparency International.

### 2.3.5 Algorithmic Government Today and Corporate Governance

The Engin, Z., and Treleaven, P., (2018) taxonomy of government services provides an overview of data science automation being deployed by governments world-wide, algorithmic government, automation of government services.

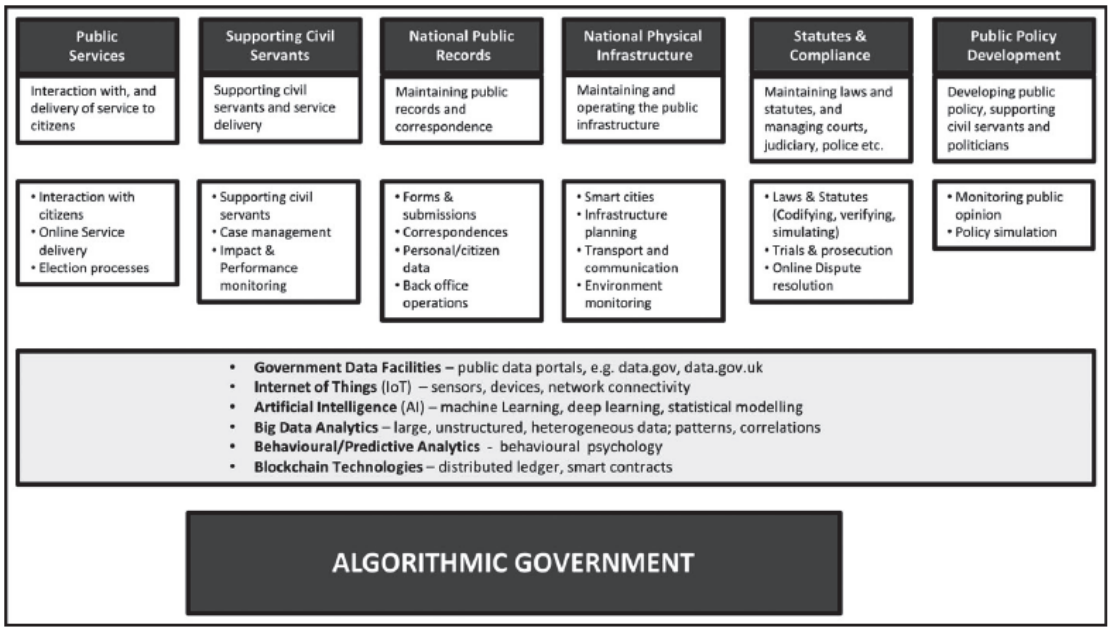


**Figure 2.5: Algorithmic Government: Automation of Government Services Engin, Z., and Treleaven, P., (2018)**

Engin, Z., and Treleaven, P., (2018) reference AI financials in their taxonomy in the context of 'credit scoring' 'financial investment and asset management', in relation to banking, trust and brokerage, and digital services, blockchain integrity, they conclude that 'Algorithmic Government will have a bigger impact on society than on finance due to the pervasive nature of the public service', the impact of AI ethics in Algorithmic government

technologies is not mentioned in their taxonomy. Data science automation of finances, AI enabled financial data and governance, is not included.86

The underpinning frameworks of AI Ethics governance, and the public policy cycle needs to be considered in more detail also corporate governance frameworks in an AI era.

In addition to existing ethics governance frameworks for financial data incorporate AI ethics, given the significant uptake of AI processes in public sector the question arises, as to where public sector corporate governance frameworks need to change to incorporate AI ethics. Globally the G20 OECD (2015) Principles of Corporate Governance are one of the Financial Stability Board's Key Standards for Sound Financial Systems also noting that they are used to assess the corporate governance component of the Reports on the Observance of Standards and Codes of the World Bank and The G20/OECD note that each government, semi-government, and private sector initiative should 'assess the quality of the corporate governance framework' should develop more detailed mandatory or voluntary provisions to take into account country-specific economic, legal, and cultural differences.' The importance of Ethics Codes is referenced throughout the report.'87 The OECD AI principles adopted in May 2019 promote AI that is innovative and trustworthy and that respects human rights and democratic values complement existing OECD standards in

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86 Engin, Zeynep., and Treleaven, Philip., (2018). *Algorithmic Government: Automating Public Services and Supporting Civil Servants in using Data Science Technologies.* Pages 448-458. Published UK. The Computer Journal Vol 62 No. 3. 2019. Retrieved from: https://academic.oup.com/comjnl/article/62/3/448/5070384

87 OECD (2015). *G20/OECD Principles of Corporate Governance*, OECD Publishing, Paris. Pages 7, 9-11. *http://dx.doi.org/10.1787/9789264236882-en* Retrieved from https://www.oecd-ilibrary.org/docserver/9789264236882-en.pdf?expires=1618051491&id=id&accname=guest&checksum=71F27CA7C3CB07081D1AC6146B3A21DB

areas such as privacy, digital security risk management and responsible business conduct.88 In June 2019 the G20 also adopted AI principles, emphasizing the need to 'continue the work on further understanding the market impact of emerging technologies and new business models, and the need to advance a fair, predictable, transparent, competitive and non-discriminatory business environment' also referencing 'data free-flow with trust' as well as human-centric AI', noting societal challenges, including the transitions in the labour market, privacy, security, ethical issues, new digital divides and the need for AI capacity building. 89

International Finance Corporation World Bank and European Confederation of Director's Associations (EcoDa) (2015) overview of the changes taking place across the EU's corporate governance landscape includes considering laws, EU directives and regulations and firm-level actions noted as having improved disclosure and transparency in areas including accounting accuracy. They note that the September 2014, Council of the European Union Directive on disclosure of nonfinancial and diversity information by large companies and groups amends the Accounting Directive (2013/34/EU) applies to large public interest entities with more than 500 employees, including listed and unlisted companies, such as banks, insurance companies, and other companies so designated by member states because of their activities, size, or number of employees. They stated these companies must disclose information on Environmental; Social and employee matters;

88 OECD (2019). *OECD Principles on AI.* Published online by the OECD, France. Retrieved from: https://www.oecd.org/going-digital/ai/principles/

89 Group of 20 (2019). *G20 Ministerial Statement on Trade and Economy.* Section 1 pgh2. Section 2, pgh16, Section 3 pgh19, Section 4 pgh23. Retrieved from https://www.mofa.go.jp/files/000486596.pdf

Respect for human rights; and Anti-corruption and bribery matters in their annual reports. They note the role of the European Commission in bringing about 'substantial convergence' in corporate governance in member states, noting that in Europe's public, private and not-for-profit sectors, there are a wide variety of legal forms, and that each sector has different governance challenges and that specific codes have been developed to identify best practice principles for each sector. 90

Misuarca, G., and van Noordt, C., (2020) noted growing interest in using AI to support re-design of internal service delivery processes and policy-making mechanisms that if used in a responsible way, large data sources combined with advanced machine learning algorithms can radically improve public sector operating methods. They noted that none of the respondents they surveyed mentioned that their government had published an **AI law** which regulates the use of AI in the public sector in the last 5 years, but most indicated that a specific 'AI-law' was not planned but rather existing laws, citing, Data Protection / Data Sharing could be revised if required. **Estonia** is highlighted as a case study example of a country who reviewed their existing regulatory framework, that 'the majority of 'laws were considered technology neutral enough', that there was no need for fundamental changes or the adoption of a specific AI law. 91

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90 International Finance Corporation World Bank Group, and European Confederation of Director's Associations (EcdDa) (2015). *A Guide to Corporate Governance Practices in the European Union* Pages xi, xii, 12,13,73. Published by the International Finance Corporation, Washington, USA. Retrieved from https://www.ifc.org/wps/wcm/connect/506d49a2-3763-4fe4-a783-5d58e37b8906/CG_Practices_in_EU_Guide.pdf?MOD=AJPERES&CVID=kNmxTtG

91 Misurca, Gianluca., and van Noordt, Colin., (2020) *AI Watch*
*AI Watch Artificial Intelligence in public services*. Science for Policy Report of the Joint Research Centre (JRC). European Union, European Commission. Available at:

One new AI law was introduced, the 'Kratt' algorithmic liability law. Estonian mythology, a Kratt is a magical creature, a servant built from hay or old household items, a character as a metaphor for AI and its complexities in Estonia's digital society,92 so culture is not only preserved but enhanced by digitalization and can be found in the 2018 algorithmic-liability law, called 'Kratt' and in Estonia's current national AI 'Kratt' strategy.93 Tallin is one of the global leaders as a smart city and in 2021 was described in the Eden Strategy Institute (2020) index of smart cities as saving Estonians approximately 5 working days per year each through e-ID. 99% of Estonian state services are online. 94

Wesam, L., and Lamaa, A., (2021) discuss smart Dubai, referencing the Government Resource Planning System which they describe as a set of systems in that is the back office of the entire government, and that over 70,000 employees benefit from this system across more than 70 government entities, in human resources, procurement, inventory, financial planning. They note the savings of billions of dollars for the government, also the new single digital identity, but stated that their focus is on people,

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https://publications.jrc.ec.europa.eu/repository/bitstream/JRC120399/jrc120399_misuraca-ai-watch_public-services_30062020_def.pdf Pages 5, 36.

92 Estonia Government, author Sikkut., Siim, (2020). *AI – "Kratt" Strategy Factsheet* Retrieved from https://e-estonia.com/wp-content/uploads/2020-april-facts-ai-strategy.pdf Estonia Government by CIO Sikkut., Siim, April 2020.

93 Estonia Government, Siim Sikkut, Estonian Government CIO., (2020). *New e-estonia Factsheet National AI Kratt strategy.* Siim Sikkut, Estonian Government CIO, Estonia available at https://e-estonia.com/new-e-estonia-factsheet-national-ai-kratt-strategy/ Estonia (accessed 23 February 2022)

94 Eden Strategy Institute (2021). *2020 Top 50 Smart City Governments*. Pages 32-33. Published by the Eden Strategy Institute. Singapore. Retrieved from: Eden_Top+50+Smart+City+Governments+2020-21_DIGITAL.pdf (squarespace.com)

they want Dubai to be the happiest city for people, not just the smartest or the most technologically advanced, that their citizens, residents, and visitors always come first.95

#### *2.3.5.1 Ethics of Smart Cities with AI and Big Data, Swarm Intelligence, Governance*

The ethics of using smart city AI and Big data is explored by Ryan, M., and Gregory, A., (2019) who identify four categories of ethical issues, (1) conflict of interest and bias, (2) Economic pressure, (3) Inequalities and (4) Privacy, in the use of AI technologies in four smart cities, Amsterdam, Copenhagen, Hamburg and Helsinki. They note that this area is an underdeveloped area of research, that there is little policy to regulate AI use in smart city projects, noting there was need for more case study reports on smart cities generally. They noted that smart cities support the UN sustainable development goal 11.96

The Eden Strategy Institute (2021) ranking of the Top 50 Smart City Governments noted smart city innovations offers mayors across the world a promising new way of engaging citizens and increasing quality of life and considers the role of government in smart cities, Shanghai for example, has invested heavily in AI to design an integrated smart

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95 Lootah, Wesam., and Lamaa, Abdulkader (2021) *A city in the palm of your hand: An interview with Dubai's Wesam Lootah.* Paragraphs 6, 32. Lootah, Wesam., and Lamaa, Abdulkader McKinsey Digital 02 June 2021 Retrieved from: https://www.mckinsey.com/business-functions/mckinsey-digital/our-insights/a-city-in-the-palm-of-your-hand-an-interview-with-dubais-wesam-lootah?cid=other-eml-alt-mip-mck&hdpid=a247e786-a905-46fc-a295-35a85026deb8&hctky=12416455&hlkid=b72ca3d5dce44d55b344529ea15c38cf#

96 Ryan, Mark., and Gregory, Anya., (2019) *Ethics of Using Smart City AI and Big Data: The Case of Four Large European Cities* ORBIT Journal Volume 2 Issue 2 2019 Retrieved from: https://doi.org/10.29297/orbit.v2i2.110

city, informed by insights from the data it collected and uses AI for a many digital government services, including consumer payments and credit conversion. 97

Cudden, J., (2016) describes the early development of Dublin smart city noting that smart cities attract businesses and jobs, create efficiencies, and raises the productivity and competitiveness of the public and private sectors. He noted that smart cities also involve increased collaboration and engagement between the city authority, the academic and business sectors and, most importantly, citizens.98 Dublin applies AI to the Croke Park sports stadium to analyse video and other forms of data in real time. 99

Karvonen, A., Cugurullo, F., and Caprotti, F., Eds, (2019) note there are few empirical accounts of the implications of the ICT-enabled city to urban residents, and that digital technology and related big data in smart cities technologies is everywhere, in everything, across existing urban infrastructure, services and institutions and noted that in the coming decades that smart applications and agendas will result in fundamental changes in the ways that cities operate and how they are experienced by their inhabitants. They note

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97 Eden Strategy Institute (2021). *2020 Top 50 Smart City Governments*. Pages 24-25. Published by the Eden Strategy Institute. Singapore. Retrieved from: Eden_Top+50+Smart+City+Governments+2020-21_DIGITAL.pdf (squarespace.com)

98 Cudden, Jamie., (2016). *Dublin a smart city?* Ireland Published online by Eolas Retrieved from https://www.eolasmagazine.ie/dublin-smart-city / May 2017.

99 Eden Strategy Institute (2021). *2020 Top 50 Smart City Governments*. Pages 60-61. Published by the Eden Strategy Institute. Singapore. Retrieved from: Eden_Top+50+Smart+City+Governments+2020-21_DIGITAL.pdf (squarespace.com)

that smart cities appear to be accelerating the pace of urban change, while providing mixed outcomes.100 Will AI swarm robotics have an evolving role in how smart cities develop?

Ouarda, Z., Antonio, G., Nicolas, J., Giandomenico, S., Hamid, S., and Giancarlo F., (2019) stated smart cities are complex, and large distributed systems are characterized by their heterogeneity, security, and reliability challenges. They stated that swarm intelligence (SI) is a promising paradigm to deal with such complex and dynamic systems using their review of SI-based algorithms and existing SI-based smart city solutions they present a swarm-based framework for smart cities.101

100 Karvonen, Andrew., Cugurullo, Federico, and Caprotti, Federico Eds, (2018). *Inside Smart Cities Place, Politics and Urban Innovation* Foreword Pages xvii, 8, 9.

101 Ouarda, Zedadra., Antonio, Guerrieri., Nicolas, Jouandeau., Giandomenico, Spezzano., Hamid, Seridi., and Giancarlo Fortino (2019). *Swarm Intelligence and IoT-based Smart Cities: a Review* Pages 1, 16, 18.

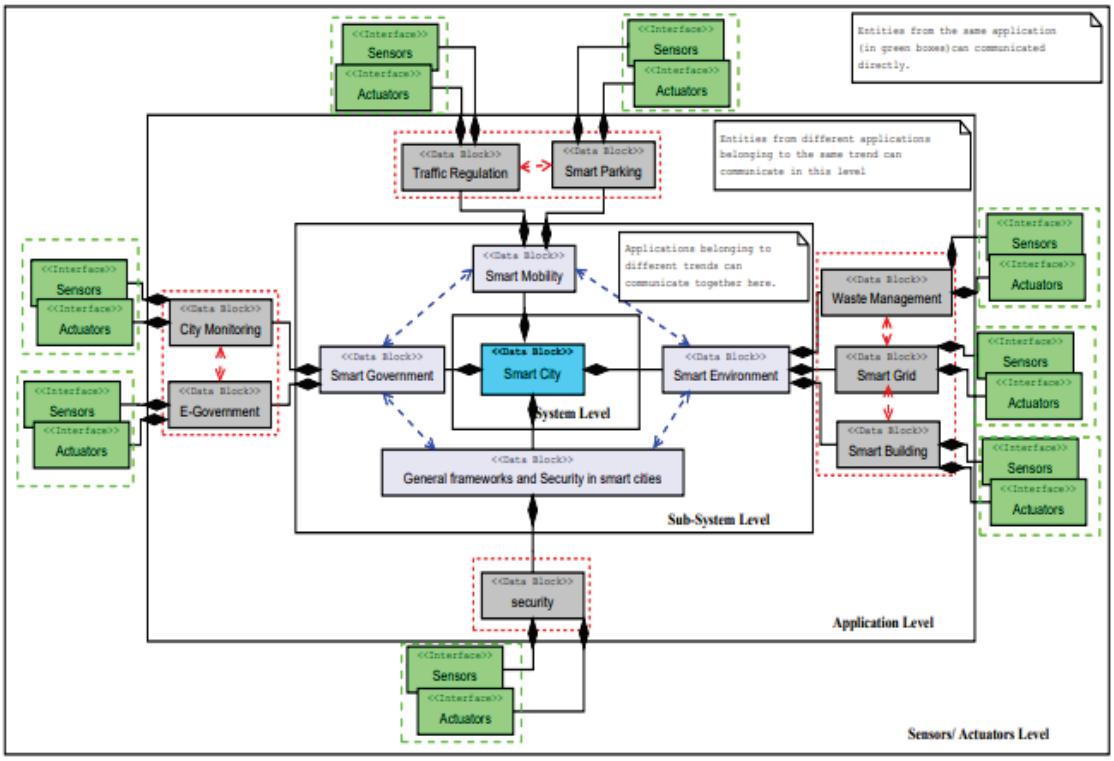


**Figure 2.6: A graphical representation of a proposed swarm intelligence-based Framework for smart cities by Ouarda, Z., et al. (2019)**

The Eden Strategy Institute (2020) stated two-thirds of the global population reside in cities, that it is ever more imperative that governments worldwide, understand how cities work and to leverage their advantages, to address the greatest challenges of our time from managing climate change, Covid-19, eradicating poverty, attaining quality education, and protecting habitats. They highlight Seoul South Korean, initiatives to develop service offerings which address citizens' transportation, digital connectivity, and civic participation needs, noting that collection, storage, analysis, and strategic use of data has been at the heart of the city's success, noting that in 2013 that the Seoul Metropolitan Government (SMG) launched the *Owl Night Bus* services after analysing three billion cases of mobile call logs and five million cases of taxi ride data, to develop optimal bus routes,

which would cater to late night commuters' needs, and that today, data inputs are channeled into an Integrated Public Big Data Storage system, which leverages artificial intelligence technology to sort and classify multiple streams of information from the city life sensors. They stated that access to a large pool of data allowed Seoul to develop appropriate policies and initiatives to address Seoul's key urban challenges such as citizen safety or congestion and they noted that this has been a collective effort, involving Seoul's citizens and private sector. *They highlight that* temperature sensors might indicate a particularly warm area where cooling technology installation should be prioritised. 102 Could a swarm-based framework help?

Thinking Smart Cities, and virtual service provision, SMG., (2021), metaverse platform, will be a "virtual public service centre envisioned as applicable to all areas of its municipal administration, such as economic, cultural, tourism, educational and civic service, with avatar public officials", "in the metaverse will" is envisaged to "provide convenient consultations and civil service" virtually, "reflecting the trends and demands for metaverse service in the public and private sectors," "providing public service to overcome restrictions in the real world that are posed by temporal/spatial limitations and language barrier, among others."[103] So much potential, all public services, for cultural, educational, and economic activity.

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102 Eden Strategy Institute (2021). *2020 Top 50 Smart City Governments*. Pages 1, 12-13. Published by the Eden Strategy Institute. Singapore. Retrieved from: Eden_Top+50+Smart+City+Governments+2020-21_DIGITAL.pdf (squarespace.com)

103 Seoul Metropolitan Government., (2021), Seoul, First Local Gov't to start new-concept public service with "metaverse platform". Paragraphs 2, 4, 6, and 7. Published by the Seoul Metropolitan Government, South Korea, https://english.seoul.go.kr/seoul-first-local-govt-to-start-new-concept-public-service-with-metaverse-platform/ (accessed 12 February 2022)

### 2.3.6 AI data analytics and Audit

Holm, J., (2020) Estonia's Auditor General, reflects on how the National Audit Office (NAO) of Estonia uses data analytics to add value through its audits and stimulate a better data exchange environment, referencing x-road the national centrally managed distributed data exchange layer which allows organisations to exchange information over the Internet in a standardized and secure way. He expressed concern that several authorities were lagging behind in better data usage noting this is because they hadn't taken the time to investigate all the data available, also because of data quality and technical issues hindering data usage. He highlights some issues 'blurry responsibilities when developing and executing state services' and unchanged 'mindsets' in some organisations which are 'tangled up in the old way of performing their duties'. He notes the importance of case studies of best practice, stating:

> Promoting best practices and pointing out the bottlenecks hindering the usage of data analytics is the main goal of our audit this time. I believe that this is more influential than performing an audit in one single field only to find out that services are not provided in the most efficient and economical manner. Benchmarking data usage for better decision making in multiple fields simultaneously prevents institutions from using their usual argument, 'everybody has the same problems.'

He calls for public auditors around the world to promote creation of a data exchange environment at governmental level, nudging the auditees to perform relevant data analysis, to identify best practices, to point out the bottlenecks which hinder data analytics use, and share their expertise and learn from best practices all over the world.104 Sikkut. S., (2020)

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104 Estonia Government, Chief Information Officer Holm, Janar., (2020). *Big data analysis and modern supreme audit institutions: tearing down the walls of data kingdoms* Page 80-84. European Union. Published by the EU, European Court of Auditors, Journal No. 1 2020, Retrieved from https://www.eca.europa.eu/lists/ecadocuments/journal20_01/journal20_01.pdf .

noted that the Information System Authority of Estonia's use machine learning for detecting anomalies and incidents on traffic on the data exchange layer connecting all digital services. 105

The Estonian Government., (2020) states, to exchange data, a member of X-tee (the data exchange layer), describes the shared data and other members can use that data based on an agreement. All members of X-tee can use the services and data of other members to improve their own business processes.106 The website notes the technology is implemented in Finland, Kyrgyzstan, Faroe Islands, Iceland, Japan, and other countries including the Ukraine and Namibia, highlighting two X-Road® ecosystems can be joined together, federated in a 'one to one' relationship and that members of the federated ecosystems can publish and consume services with each other as if they were members of the same ecosystem, noting that Finland and Estonia federated in 2018 and the government describes X-Road® (the precursor to x-tee) as a distributed data exchange layer for registers and information systems107, also that

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105 Estonia Government, Siim Sikkut, Estonian Government CIO., (2020). *New e-estonia Factsheet National AI Kratt strategy.* Page 2. Published by the Government of Estonia, Siim Sikkut, Estonian Government CIO, Estonia available at https://e-estonia.com/new-e-estonia-factsheet-national-ai-kratt-strategy/ Estonia (accessed 23 February 2022)

106 Estonia Government (2020) *Data Exchange Layer x-tee* Retrieved from https://www.ria.ee/en/state-information-system/x-tee.html (accessed 11 May 2021: last modified 10 07 2021)

107 Estonia Government (2021) *Interoperability Services.* Paragraph 4, Retrieved from X-Road® — e-Estonia (accessed 11 May 2021)

Note: The webpage heading lines: Paragraph 1: "21st century citizen-centred state and service-oriented society requires information systems to function as an integrated whole to

X-Road® software-based solution X-tee is the backbone of e-Estonia. Invisible yet crucial, it allows the nation's various public and private sector e-service information systems to link up and function in harmony108.

Estonia's e-solution environment includes a full range of services for the general public, and since each service has its own information system they all use X-tee. To ensure secure transfers, all outgoing data is digitally signed and encrypted, and all incoming data is authenticated and logged.

It connects different information systems that may include a variety of services. It has developed into a tool that can also write to multiple information systems, transmit large data sets and perform searches across several information systems simultaneously. X-Road® software based Estonian environment X-tee was designed with growth in mind, so it can be scaled up as new e-services and new platforms come online." 109

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support citizens and organisations. There must be interoperability between different organisations and information systems.

In other words, they must be able to work together, and data only needs to be requested from the citizen once. Estonia's solution for maintaining a modern state is X-Road, which saves Estonians 1345 years of working time every year." (Accessed 03 March 2022)

108 Estonia Government (2021) *We have built a digital government and we can show you how* Retrieved from https://e-estonia.com/ (accessed 11 May 2021)

109 Estonia Government (2021) *Interoperability Services* Paragraphs 2, 3, and 4. Retrieved from X-Road® — e-Estonia (accessed 11 May 2021)

**Figure 2.7: X-Road Estonia, Interoperable systems., by the Estonian Government (2016) Youtube** X-Road introduction (longer version) - YouTube

Pencheva, I., Esteve, M., and Slava. I.J., (2018) review of Policy and Administration literature on the role of Big Data and advanced analytics in public sector noted that although 'Public' organisations generate huge amounts of data; yet they are often unlikely to use it to gather valuable insights or transform services. They highlighted that this research area is under-developed and further research should consider all possible contingencies when describing possible effects of Big Data-related initiatives on specific public policies or public organisations.110

110 Pencheva, Irina., Esteve, Marc., Jankin and Mikhaylov, Slava., (2018). *Big Data and AI – a transformation shift, for government: So, what's next for research?* Pages, 34, 39. Published in 2020 by the Journal of Public Policy and Administration 2020, Vol. 35(1) 24–44. @The Authors 2018, Article reuse guidelines: sagepub.com/journals-permissions DOI: 10.1177/0952076718780537 journals.sagepub.com/home/ppa

Reddin, J., (2018) noted that governments worldwide are trying to make greater use of big data by linking up their own datasets, with other data points and analysing the data to generate significant insight noting that from analysis of the government of Canada, departments and agencies, qualitative survey, risks and issues were mentioned with infrastructure and access receiving the highest mention, also, that a surprising finding was that reference to the need for changes in mind-set and culture featured more strongly in the public service than data literacy, discrimination and ethics.111

DPER OGCIO (2019) state that the move towards better data management practices and regulated data sharing is prevalent amongst global organisations including EU bodies, advocating a whole-of-government approach. They reference OECD principles of digital government strategies, the Tallin Declaration, the EU Interoperability Framework and other principles and frameworks,

> Note: Principle 7 of the OECD's 12 principles of digital Government strategies states that Governments "should develop common policies and standards" and "drive the adoption of national interoperability frameworks for data exchange.112

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111 Redden, Joanna., (2018). *Democratic governance in an age of datafication: Lessons from mapping government discourses and practices* Pages 1-10. Article was first published online: November 22, 2018; Issue published: July 1, 2018. Research Article https://doi.org/10.1177/2053951718809145. This article is distributed under the terms of the Creative Commons Attribution 4.0 License (http://www.creativecommons.org/licenses/by/4.0/) which permits any use, reproduction and distribution of the work without further permission provided the original work is attributed as specified on the SAGE and Open Access pages (https://us.sagepub.com/en-us/nam/open-access-at-sage).

112 OECD (2021). 12 Principles of digital government strategies https://www.oecd.org/governance/digital-government/toolkit/12principles/ Principle 7 Effective organizational and governance co-ordination framework: website https://www.oecd.org/governance/digital-government/toolkit/principle7/ France, Published by the OECD.

Note: The EU's Tallinn declaration of Oct 2017 states that we should take steps to create a culture of re-use, including responsible and transparent re-use of data within our administrations.113

Note: The EU's European Interoperability Framework (EIF) outlines the objective of "Promoting seamless services and data flows for European public administrations". The aim of the EIF is to inspire European public administrations in their efforts to design and deliver seamless European Public Services to other public administrations, citizens and businesses.114

The European Digital Agenda and UN advocacy on data sharing and data standards are also referenced. 115

The UN (2021) state that open government data is an important initiative that strengthens participatory governance, open government data allows citizens to monitor data streams and thereby improves the accountability and transparency of government and that open government data also allows citizens to be aware of important issues and to be part of the decision-making process to address policy issues (e-participation). 116

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113 EU, European Commission (2017). *Tallin Declaration on e-government* Page 4. Retrieved from https://digital-strategy.ec.europa.eu/en/news/ministerial-declaration-egovernment-tallinn-declaration

114 EU, European Commission (2017). *EU Interoperability Framework for the EU https://ec.europa.eu/isa2/sites/isa/files/eif_brochure_final.pdf* Luxembourg. On European Commission ISA 2 Interoperability solutions for public administrations, business and citizens *https://ec.europa.eu/isa2/eif_en* European Commission, accessed 11 May 2021.

115 Ireland, DEPR OGCIO (2019). *Public Service Data Strategy 2019-2023* Page 5. Retrieved from https://www.gov.ie/en/publication/386c8-public-service-data-strategy-2019-2023/

116 UN, Division for Public Institutions and Digital Government (DPIDG), UNDESA. (2021). *Open Government Data and Services.* Paragraph 1. UN. Geneva Switzerland. Retrieved from https://publicadministration.un.org/en/ogd on 11 May 2021.

In 2020 the EU also highlights excellence and trust in AI within the Digital Agenda noting excellence definitions include, setting up a new public-private partnership in AI and robotics, and using AI to make public procurement processes more efficient also supporting the procurement of AI systems by public bodies. Trust definitions include requiring high-risk AI systems to be transparent, traceable, to be under human control and to ensure unbiased datasets. 117

The European Commission (2020) Open Data Maturity assessment noted that measuring impact is a complex task, that there is still no shared understanding of how to do it best, noting that many European countries are engaging with communities of data re-users to understand and capture the extent to which open data is re-used and how value is created, and that the European Commission plans to develop a shared impact framework over the upcoming years.118

Ariga, T., Sanford, S., United States of America, (USA), Government Accountability Office (GAO) (2020) stated the GAO is developing an AI oversight framework, collaborating with stakeholders and identify AI governance related questions for consideration in relation to big data and digital audit, to develop best practices highlighting different types of inferential questions and empirical questions for a risk

117 EU, European Commission (2020). *Digital Agenda, Excellence and Trust in AI.* Belgium, Brussels. European Commission factsheet dated 19 February 2020. Retrieved from: *https://ec.europa.eu/commission/presscorner/detail/en/fs_20_282*

118 EU, European Commission, Open Data Portal. (2020). *Open Data Maturity Report.* European Commission Belgium, Brussels. Page 5. Open Data in Europe 2020 | data.europa.eu Accessed 11 May 2021, last updated 10 February 2021.

assessment, outlined below and they consider three pillars for impacts cultural, workforce and infrastructure.

| GOVERNANCE | EMPIRICAL QUESTIONS | INFERENTIAL QUESTIONS |
|---|---|---|
| Explainability and Transparency | • Do traceable audit trails exist behind each model prediction?<br>• What are the input and output dependencies across models?<br>• Are model outputs described in natural language with sufficient details? | • What documentations exist behind models customized from commercially available algorithms or application program interfaces (APIs)?<br>• What are the criteria and contexts that govern use of supervised, unsupervised, reinforcement, and alternative or 'blackbox' techniques? |
| Bias and Fairness | • Do underlying training and validation data sets meaningfully represent constituent groups?<br>• What is the diversity makeup of AI development teams across skill sets, experiences, domain knowledge, and backgrounds? | • What is the strategy to continually evaluate macro- and micro-level disparate impacts across constituents?<br>• What is the process that governs disclosure, review, and appeal stemming from automated decision making? |
| Integrity and Resilience | • What are the performance stability metrics of models across different operating environments and conditions?<br>• What are the confidence and error rates behind labeled data and models?<br>• How are the models deployed, scaled, and orchestrated? | • What is the governance behind model training, validation, and re-training?<br>• What security procedures are in place to protect models from adversarial attacks? |
| Data Quality and Lineage | • How are data taxonomy, lineage, transformations, and metadata governed across sources?<br>• Do audit trails exist for labeled data and imputed values?<br>• How is data quality verified? | • What are the criteria and contexts that govern remediation strategy of data quality issues?<br>• How is lifecycle of data managed and governed across the organization? |

**Table 2.1 Governance related questions on AI by the USA Government Accountability Office (GAO) (2020)**

They note that the field of AI is rapidly evolving, that its known and unknown effects will have a growing impact on government and society. 119

### 2.3.7 AI ethics and Algorithmic Government Conclusion

This question considered what are AI ethics and why are they important? AI ethics were defined (Müller, V. (2020), Leslie, D., (2019), Dignum, V. (2018)). The need for a worldview as highlighted (McCarthy, J. 2006), noted as ever more important in the context of AI emerging use in Public Sector government, including chatbots, AI powered digital services, Machine Learning, and development of AI Ethics aligned with Public Service Values (Rossi, F., et al. (2019), Ryan, M., and Gregoy, A., (2019) Ouards, Z., et al. (2019), van Wynsberghe, A., and Donahuser, J., (2018), Heaven, D., (2018)).

Citizen engagement in development of AI Ethics for example, through crowdsourcing AI ethics (Awad, E. and Levine, S., (2020), Scalable Corporation., Mit Media Lab., and Massachusetts Institute of Technology., (2016)) highlights the importance of citizens shaping AI ethics and the social construction of society, moral conduct, widely accepted standards of right and wrong, ethical AI and Ethics of AI, principles and values (OECD (2021, 2019, and 2015), UN (2021), European Commission (2021), Transparency International (2021), Gellers, Joshua, C., (2021), Schiff. D. et al. (2020), Siau, K., and Wang, W., (2020), Weiu, W., and Keng, S., (2020), Moss, E. et al. (2020), G20 (2019),

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119 Ariga, Taka, Sanford, Stephen., of the USA Government Accountability Office. (2020). *A if for Accountability – oversight in the age of artificial intelligence.* Pages 88-90. Published in the Journal of Public Policy and Administration 2020, Volume 1. European Union, European Court of Auditors, Luxembourg. Editor in Chief: Gaston Moonen. Deputy Editor Derek Meijers. Retrieved from https://www.eca.europa.eu/en/Pages/NewsItem.aspx?nid=13397

Engin, Z. and Treleaven, P., (2018) European Parliament (2017), Weick, K., (1993) and Ginsberg, M., (1986)).

Robot rights are discussed in the context of 'kill switches' (Gellers, Joshua, C., (2021), Siau, K., and Wang, W., (2020), (Kortelainen, J., (2016)). The role of the EU in achieving substantial convergence in corporate governance in member states (EcoDa 2015) is reflected upon, along with Smart Cities and AI and UN sustainable development goals (Korvonen et al. Eds. (2019), and swarm robotics (Schranz, M., et al. (2020). The Metaverse potential for all public services, for cultural, educational, and economic activity is noted (SMG, 2021).

(Ariga, T., and Sanford, S., (2020), Haynes, A., (2020) and Holm, J., (2020) identify inferential and empirical questions for a risk-based assessment of governance of big data and digital audit, under the headings explainability and transparency, bias and fairness, integrity and resilience, and data quality and lineage and Reddin, J., (2018) highlights an additional surprising finding, mindset and culture, in addition to data literacy, discrimination and ethics.

The importance of AI ethics governance is considered in the context of global public sector ethics (Transparency International (2021) and (2015) Public Policy delivery (Heaven, D., (2018), VanWynsberghe, A., and Donhauser, J., (2017)) the meaning of citizenship (EU 2021, Gellers, Joshua, C., (2021), Vergez, C, (2007)). Engin, Z., and Treleaven, P., (2018) provide an overview of data science automation being deployed by governments world-wide, algorithmic government today.

Question 2

*Do ethics governance frameworks for financial data incorporate AI ethics?*

## 2.4 Do ethics governance frameworks for financial data incorporate AI ethics?

Do existing ethics governance frameworks for financial data incorporate AI ethics? This section will consider financial data and ethics in the context of all sectors, private, public, and voluntary.

### 2.4.1 Financial governance structures and measures

Financials are a global language. AI and machine learning already transforms financial data use globally. There are two main approaches to public sector, 'cash-based' accounting, 'accrual-based' accounting, are the primary bases. Metcalfe, A., and Sanderson, K., (2019) state accruals-based accounts provide more complete information than cash-based accounts and around the world there is a drive for governments to implement accrual accounting, that accrual basis accounting results in better management of assets as officials understand what assets are information from accruals, that accruals information provides the baseline for a longer-term view of government finances, through intertemporal balance sheet management and sustainability reports, and, that when combined with accrual budgeting, reforms can support a better understanding of the cost of government services and is also a performance driven system placing finance at the heart of government decision making.120 The lead for this drive, and the source of Public Sector

120 Association of Chartered Certified Accountants and the IFAC, ACCA, Alex Metcalfe Head of Public Sector Policy, and Karen Sanderson, FCCA (2020) *IPSAS is cash still king? Maximising the benefits of accrual information in the public sector.* Pages 6 and 47, published by ACCA London UK and IFAC. Switzerland, USA. Retrieved from: https://www.ifac.org/system/files/publications/files/pi-IPSAS-is-cash-still-king-v5.pdf

specific accounting standards is the International Federation of Accountants (IFAC) International Public Sector Accounting Standards Board (IPSASB).121 The IFAC, IPSASB has produced public-sector specific standards International Public Sector Accounting Standards (IPSAS) being adopted globally or adaptations of same such as in the EU, the European Public Sector Accounting Standards (EPSAS).122

#### 2.4.1.1 The Vision, Mission and Values of lead standard setters in the financial world

Understanding the vision, mission, and values of lead standard setters in the financial world aids understanding of the key role of financials in all sectors. The IFAC's vision is that through its standards and advocacy roles and global membership that it is recognized as a valued leader in developing strong and sustainable organizations, financial markets, and economies. The IFAC's values are integrity, expertise, and transparency.123

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121 IFAC, IPSASB (accessed 11 May 2021). IFAC. Switzerland, USA. Retrieved from: https://www.ipsasb.org/ and latest report on public sector adoption of accrual basis accounting benefits.

122 EU, European Commission, Eurostat (accessed 11 May 2021). on EPSAS Retrieved from Overview - EPSAS - Eurostat (europa.eu)

Eurostat on their website state: "EPSAS aims to *increase the transparency and comparability of public sector financial accounting* and reporting between and within EU Member States by developing and implementing a *harmonised European accounting framework*. This will inform governance, policy and decision-making and the management of public finances."

123 IFAC (2010). Strategic Plan, Mission and Values Page 7. IFAC. Switzerland, USA. Retrieved from https://www.ifac.org/system/files/downloads/Section_2_Strategic-Plan_Mission_and_Values_11-19-10.pdf (accessed 11 May 2021).

The global Institute of Internal Auditors (IIA) (2021) mission includes providing dynamic leadership for the global profession of internal auditing activities,124 the mission of Internal Audit is stated as 'to enhance and protect organizational value, by providing risk-based and objective assurance, advice, and insight.'125 The IIA is an affiliate member of the IFAC.126

The Association of International Certified Professional Accountants (AICPA) (2021) mission is to drive a dynamic accounting profession ready to meet the demands of a constantly changing, disruptive world, to protect the public interest and powering trust, opportunity, and prosperity worldwide, their website highlights the "Accelerated pace of change and advances in technology are creating the need to go beyond convention, disrupting the ways in which we think, learn, communicate, conduct business."127 The AICPA is an affiliate member of the IFAC.128

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124 Institute of Internal Auditors (IIA) (2021). *Mission of IIA.* Florida, USA. Retrieved from Pages - About The Institute of Internal Auditors (theiia.org) (accessed 11 May 2021).

125 IIA (2021). *Mission of Internal Audit*. Florida, USA. Retrieved from Pages - Mission of Internal Audit (theiia.org) (accessed 11 May 2021).

126 IFAC (2013). *IFAC and IIA strategic agreement* IFAC. Switzerland, USA. Retrieved from https://www.ifac.org/news-events/2013-07/ifac-signs-strategic-agreement-iia (accessed 11 May 2021).

127 Association of International Certified Professional Certified Accountants (AICPCA)., (2021). *Mission and History* USA. Retrieved from: *https://www.aicpa-cima.com/* (Accessed 11 May 2021)

128 IFAC., (2020). *Association international certified professional accountants (AICPA).* IFAC. Switzerland, USA. Retrieved from https://www.ifac.org/about-

The Institute of Management Accountants (IMA) (2021) vision is to be the leading resource for developing, certifying, connecting, and supporting the world's best accountants and financial professionals in business. Their mission is to be a forum for research, practice development, education, knowledge sharing, advocacy of the highest ethical and best business practices in management accounting and finance. Their core values include, 'Highest Standards of Integrity and Trust', 'Innovation and Continuous Improvement' and 'Teaming to Achieve'. The IMA sets ethical as well as initial and continuing professional development (CPD) requirements for all Certified Management Accountants (CMA)129 The IMA is a member of the IFAC130 and the AICPA.

The Organization for Economic Cooperation and Development (OECD), (2021) focus is to seek to build better policies for better lives. Their goal is to shape policies that foster prosperity, equality, opportunity, and well-being for all. The OECD stated:

> "Together with governments, policy makers and citizens, we work on establishing evidence-based international standards and finding solutions to a range of social, economic and environmental challenges. From improving economic performance and creating jobs to fostering strong education and fighting international tax evasion, we provide a unique forum and knowledge hub for data and analysis,

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ifac/membership/members/association-international-certified-professional-accountants-aicpa (Accessed 11 May 2021)

129 Institute of Management Accountants (IMA) (2021) *About IMA.* IMA New Jersey, USA Retrieved from: About IMA | IMA - The association of accountants and financial professionals working in business. (imanet.org) (Accessed 11 May 2021)

130 IFAC (2021). *Statements of membership obligations (SMOs) 1-7 (Revised).* IFAC. Switzerland, USA. Retrieved from https://www.ifac.org/knowledge-gateway/developing-accountancy-profession/publications/statements-membership-obligations-smos-1-7-revised (Accessed 11 May 2021)

exchange of experiences, best-practice sharing, and advice on public policies and international standard setting."131

The OECD (2021) engages extensively with civil society as they believe this helps improve their policy recommendations and their impact on society. They state that governments and policymakers are accountable to a wide array of policy shapers, including civil society, and with its subject-matter expertise and field experience, that civil society brings vital knowledge to help advance policy change, that as public participation, civic engagement, activism and mobilisation evolve, the OECD aims to provide spaces for dialogue, and avenues for civil society contributions currently including public consultations, events including shaping AI policy.132

**Figure 2.8: OECD Civil Society- Engage with us by the OECD (2021)**

131 OECD (2021) *about the OECD* France. Retrieved from About the OECD - OECD (Accessed 11 May 2021)

132 OECD (2021) *OECD Civil Society – Engage with us.* Website, OECD, Paris, France. Retrieved from: https://www.oecd.org/about/civil-society/ (Accessed 22 May 2021)

The OECD (2016) reported governance of cross-tier public infrastructure investment as a key challenge in collaboration for public investment strategies across government, reporting that:

> *"even in situations where the actors involved clearly recognise the need for it. Transaction costs, competitive pressures, resource constraints, differing priorities and fears that the distribution of costs or benefits from co-operation will be one-sided, can all impede efforts to bring governments together. The national government holds a key strategic role in convening investment priorities, strengthening capacities of different levels of government involved in managing public investment, and ensuring sound framework conditions for governing public investment.*

Although AI is not specifically mentioned the OECD noted that infrastructure systems should be resilient, adaptable to new circumstances and future proof, that critical risks materialise, and technological change can fundamentally disrupt sectors and economies. [133]

The Corporate Finance Institute (CFI) (2021) state the OECD improves economies and world trade also promoting policies that will improve the economic and social welfare of people in developed nations and their objectives focus on helping governments globally to, "Improve confidence in markets and the institutions that help them function,", to "obtain healthy public finances to achieve future sustainable economic growth." To "Achieve growth through innovation, environmentally friendly strategies, and the sustainability of

133 OECD (2019) *Getting Infrastructure Right, 10 key policy challenges and governance options.* Pages 8, 13. OECD, Paris, France. Report summary, Retrieved from: https://www.oecd.org/gov/getting-infrastructure-right.pdf Full report at DOI https://doi.org/10.1787/9789264272453-en (Accessed 22 May 2021)

developing economies," and finally, to "Provide resources for people to develop the skills they need to be productive."134

The mission of the International Monetary Fund (IMF) (2021) is to ensure the stability of the international monetary system, which is the system of exchange rates and international payments which enables countries and their citizens to transact with each other. The IMF, also facilitates international trade, promotes employment and sustainable economic growth, and helps to reduce global poverty.135

The World Bank mission is seeking to end extreme poverty globally, to be achieved by reducing the share of the global population that lives in extreme poverty to 3 percent by 2030, and the World Bank also promotes shared prosperity by seeking to increase the incomes of the poorest 40 percent of people in every country and commit to promoting sustainable development. The World Bank is one of the world's largest sources of funding and knowledge for developing countries. The World Bank values are: Impact, Integrity, Respect, Teamwork, and Innovation. They work with private and public sectors to progress their mission globally. 136

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134 Corporate Finance Institute (CFI) Education Inc. (2021) *The OECD an international organization that promotes policy coordination and economic freedom among developed nations.* Vancouver, Canada. Website © 2015 to 2021 Corporate Finance Institute (CFI) Education Inc. Retrieved from *https://corporatefinanceinstitute.com/resources/knowledge/economics/oecd/* (Accessed 11 May 2021) ['The CFI provides courses, certifications and technology solutions for finance professionals' see 'About CFT' page on their website]

135 The IMF., (2021). *Factsheet IMF at a glance 03 March 2021.* Washington, USA. Retrieved from: *https://www.imf.org/en/About/Factsheets/IMF-at-a-Glance* (Accessed 12 May 2021)

136 The World Bank Group., (2021). *The World Bank, Who We Are.* Washington, USA. Retrieved from *https://www.worldbank.org/en/who-we-are* @2021.

Hunter, A., through IFAC (2021) notes the blurring of lines for financial operations noting that non-accountants are undertaking the accounting function through for example, Business Intelligence (BI) roles and new responsibilities and opportunities for accountants working outside of finance departments in business or public sector now exist.

> "What is becoming clear is that the accounting function within an organisation is increasingly being undertaken by a range of employees coming from outside of the accountancy profession. That is, they are not, by training, accountants.
> A good example is in business intelligence where the proliferation of BI roles and responsibilities within the finance department might previously have been solely the domain of the strategic management accountant. The converse is also a tremendous opportunity for accountants: their skills and training open a larger field of employment outside the finance departments of big businesses or the world of public practice."137

The European Commission (2017) notes that Public authorities must be able to adjust to dynamic and often disruptive changes in the economy and society and that in an increasingly 'connected' but uncertain world, policies and structures that have been successful in the past might not be sufficient or appropriate to serve citizens and business in the future. They define EU principles and values noting that principles should be fundamental and enduring, citing an example as *honesty* which should apply to all public officials irrespective of time or place. The toolbox is a helpful and practical guide for civil and judicial administrations set out across 9 themes.

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137 Hunter, Andrew., CEO Certified Professional Accountants, (CPA), Australia, (2021). *The Future for Accounting*. Published by the IFAC, Switzerland, USA. Retrieved from https://www.ifac.org/knowledge-gateway/preparing-future-ready-professionals/discussion/future-accounting (Accessed 12 May 2021)

Three themes deal with public administration core functions, policy making, its implementation, monitoring and evaluation (theme 1), service delivery (theme 5), public finance management (theme 8), one theme focuses on the major challenge to good governance from ensuring ethical behaviour and tackling corruption (theme 2) and the mechanics of public administration, government structures at various levels, and their organisation, coordination and cooperation (theme 3) and managing performance, quality and people within public institutions to develop and deliver policies (theme 4) are the other three themes. It refers to the European Interoperability Framework 12 principles for establishing interoperable public services at the EU level, Subsidiarity and proportionality, Openness, Transparency, Reusability, Technological neutrality and data portability, User-centricity, Inclusion and accessibility, Security and privacy, Multilingualism, Administrative simplification, Preservation of information, Assessment of effectiveness and efficiency, noting that the changing relationship between administration and service user through eGovernment can only happen if institutions are willing and able to work together, that it is all about interoperability, the ability of systems to work together, within or across organisational boundaries and EU borders, to exchange, interpret, use and re-use information. The public administration faces legal, institutional and technological obstacles, and important considerations of data protection and privacy. For example, some countries are restricted from sharing citizens' data by law, highlighting the key role that all Member States play in implementing end-to-end e-Procurement and the countries noted that Governments can lay the foundations by opening up non-sensitive public data in line

with the PSI Directive138, and also by basing development and delivery of online services on open standards.

Robots AI and Big Data are referenced in the context of workforce planning and digital workforce and the EC noted that AI and big data will make knowledge-based jobs even if analytical and decision-making, increasingly redundant, that processing power, predictive algorithms, cloud computing, noting that massive datasets enable computers to 'machine-learn', to replace tasks which involve repetitive processes and patterns and are therefore predictable. They reference the emerging complexities in the context of the full panoply of policy dilemmas faced by governments also noting that these trends are not new, but rather the accentuation and acceleration of old ones and that Member States will need to adjust to a 'new normal'. 139

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138 European Union, European Commission., (2021). *Shaping Europe's' Digital Future From the Public Sector Information (PSI) Directive to the open data Directive.* Luxembourg. Retrieved from: *https://digital-strategy.ec.europa.eu/en/policies/psi-open-data* Accessed 12 May 2021 last updated 10 March 2021)

> Note: The EU open data market is a key building block of the overall EU data economy. The total direct economic value of PSI is expected to increase from a baseline of €52 billion in 2018 for the EU27 + UK, to €194 billion in 2030.
> The European Commission adopted a proposal for a revision of the PSI Directive (Directive 2013/37/EU) in April 2018. The proposal was presented as part of a package of measures aiming to facilitate the creation of a common data space in the EU. This review also fulfils the revision obligation set out in Article 13 of the Directive.
> The recast proposal was the result of an extensive public consultation process, an evaluation of the current PSI Directive and an impact assessment. This proposal received a positive opinion from the Regulatory Scrutiny Board.

139 European Union, European Commission, Inter-service group on Public Administration Quality and Innovation., (2021). *Toolbox, 2017 Edition, Quality of Public Administration Toolbox Abridged Version* Pages, 11, 12, 13, 18, 103, 136, 137, 138, 187. European Union, European Commission, Luxembourg. Editor: Florian Hauser, European Commission, Directorate General for Employment, Social Affairs and Inclusion, technical assistance of the European Institute of Public Administration (EIPA) Mackie O' Sullivan Consulting Ltd. Manuscript completed in August 2017. Publications Office of the

The European Commission (2021) note the 'toolbox aims to support, guide and encourage those who want to modernise public administrations in support of prosperous, fair and resilient societies. It is intended as a reference and resource by pointing readers to existing EU policies and international practices, illustrated by almost 170 inspirational case studies.'140

The question of ethics and AI belongs with all involved in financials both accountants and non-accountants. But to consider accountants ethical frameworks first in how they relate to AI and financial data, production, interpretation, audit, and assurance.

#### 2.4.1.2 Financial Ethics Codes and Advocacy

The IFAC international code of ethics141, is the standard of ethical behavior all professional accountants comply with, to adhere to the fundamental principles of ethics, and where applicable, be independent. The code was developed by the independent standard-setting board that develops, in the public interest, high-quality ethical standards

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European Union, 2017. Retrieved from Quality of Public Administration - A Toolbox for Practitioners | Shaping Europe's digital future (europa.eu) link provided to the webpage update 13 November 2017 at Publications catalogue - Employment, Social Affairs & Inclusion - European Commission (europa.eu) (Accessed 12 May 2021)

140 *Ibid.* (2021). Retrieved from Quality of Public Administration - A Toolbox for Practitioners | Shaping Europe's digital future (europa.eu) (Accessed 12 May 2021)

141 IFAC., (2020). *Handbook of the International Code of Ethics for Professional Accountants including International Independence Standards*. IFAC, Switzerland, USA. Retrieved from: https://www.ifac.org/system/files/publications/files/IESBA-English-2020-IESBA-Handbook_Web-LOCKED.pdf (Accessed 12 May 2021)

and other pronouncements for professional accountants worldwide142. This code is the basis of the codes of ethics of all accountancy bodies for example Chartered Accountants Ireland (CAI) Code of ethics.

> The Code applies to all members, students and affiliates of Chartered Accountants Ireland, regardless of industry, role or expertise. The Code also applies to member firms of Chartered Accountants Ireland and they are responsible for ensuring their employees also apply with its requirements.
> As a member of the International Federation of Accountants (IFAC), Chartered Accountants Ireland have complied with their requirements and adopted the Code of Ethics for Professional Accountants developed by the International Ethics Standards Board for Accountants (IESBA).
> Chartered Accountants Ireland include in the Code additional material that is deemed both relevant and useful to our members. The amended Chartered Accountants Ireland Code of Ethics also include additional ethical considerations arising from other Institute bye-laws and regulations applying to all members. Specific to Chartered Accountants Ireland, the amended Code also includes Part 5 that applies to members who are Insolvency Practitioners. Members involved in Statutory Audits are also required to comply with Ethical Standards for Auditors issued by Irish Auditing and Accounting Supervisory Authority (IAASA) in respect of Republic of Ireland and the Financial Reporting Council (FRC) in respect of United Kingdom.

The website states that Chartered Accountants may also need to adhere to codes of ethics or ethical standards, or to codes of conduct from specific regulatory authorities for

142 IFAC, Accountants Ethics Board., (2021). *International Code of Ethics for Professional Accountants.* IFAC Accountants Ethics Board. Switzerland, USA. Retrieved from https://www.ethicsboard.org/international-code-ethics-professional-accountants (Accessed 12 May 2021) [This is an e-Code only]

the member's role, for example, banking and financial services, or for regulated services in a jurisdiction referencing, Ethical Standards for Auditors143 144.

The CAI code references technological resources, which can be inferred to include AI, and states in respect of members in Business.

> Senior professional accountants in business ("senior professional accountants") are directors, officers or senior employees able to exert significant influence over, and make decisions regarding, the acquisition, deployment and control of the employing organisation's human, financial, technological, physical and intangible resources. There is a greater expectation for such individuals to take whatever action is appropriate in the public interest to respond to non-compliance or suspected non-compliance than other professional accountants within the employing organisation. This is because of senior professional accountants' roles, positions and spheres of influence within the employing organisation.145

The CAI Code website stated the CAI Code of Ethics has adopted the IFAC Code. 'As a member of the International Federation of Accountants (IFAC*), Chartered Accountants Ireland have complied with their requirements and adopted the Code of Ethics

143 Chartered Accountants, Ireland., (2020) *Ethics Resource Centre, The Code of Ethics for Members.* Dublin, Ireland. Retrieved from: *https://www.charteredaccountants.ie/Ethics/The-Code-of-Ethics* (Accessed 12 May 2021, last updated 01 December 2020)

144 Irish Auditing and Accounting Supervisory Authority (IAASA)., (2021). *IAASA Ethical Standards for Auditor's Ireland.* Dublin, Ireland. Retrieved from IAASA - Ethical Standard for Auditors (Ireland) *Ethical Standard for Auditors (Ireland) 2020.* Dublin, Ireland. Retrieved from Ethical_Standard_Nov_2020.pdf (iaasa.ie) (Both accessed 12 May 2021)

145 Chartered Accountants, Ireland., (2020). *Professional Standards, Chartered Accountants Ireland The Code of Ethics for Members.* Pages, 188, 200. Dublin, Ireland. Retrieved from code-of-ethics---december-2020.pdf (charteredaccountants.ie) (Accessed 12 May 2021, last updated 01 December 2020)

for Professional Accountants, developed by the International Ethics Standards Board for Accountants (IESBA)'. 146

Accountants are required to make annual declarations of compliance with their institute's ethics codes and standards and that they have completed a defined number of hours of continuous professional development (CPD).

The Committee on the Financial Aspects of Corporate Governance and Gee and Co. Ltd. (1992) report, referred to as the Cadbury Report, is a key reference document in financial Corporate Governance and its definition of Corporate Governance roles and responsibilities, merits quoting. Corporate governance is defined in the Cadbury report as "The system by which companies are directed and controlled". Within that overall framework, the financial aspects duties are advised as:

> "the way in which boards set financial policy and oversee its implementation, including the use of financial controls, and the process whereby they report on the activities and progress of the company to the shareholders."

The role of auditors is noted as 'providing shareholders with an external and objective check on the directors' financial statements' the 'basis of that reporting system' and the director's reports although addressed to the shareholders, are noted as being 'important to a wider audience' including employees, and that directors have a statutory duty to take the wider audience interests into account in their reports.147

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146 Chartered Accountants, Ireland., (2020). *Chartered Accountants Ireland Ethics Resource Centre, The Code of Ethics for Members.* Dublin, Ireland. Retrieved from: The Code of Ethics (charteredaccountants.ie) © Copyright Chartered Accountants Ireland 2020 (Accessed 12 May 2021)

147 The Committee on the Financial Aspects of Corporate Governance and Gee and Co. Ltd. (1992). *The Financial Aspects of Corporate Governance* Sections 2.5-2.8. The

The OECD (2017) identified a non-exhaustive list of algorithms that pose multiple different risks for market competition for different types of algorithm, noting if companies implement deep learning algorithms to automatically set prices and other decision variables, collusion becomes even harder to prevent using traditional antitrust tools because a deep learning algorithm processes raw data in a complex, fast and accurate way, resembling the human brain, and, delivers an optimal output without revealing the relevant features that were behind the decision process, that, by relying on deep learning, firms may be actually able to reach a collusive outcome without being aware of it, raising complex questions on whether any liability could ever be imposed on them should any infringement of the law be put in place by the deep learning algorithm, also, that:

> "there is the risk that some algorithms with powerful predictive capacity, by constantly learning and readapting to the actions of other market players (who may be human beings or artificial agents themselves), will be able to collude without the need for any human intervention.
> It is still not clear how machine learning algorithms may actually reach a collusive outcome. But once it has been asserted that market conditions are prone to collusion, it is likely that algorithms learning faster than humans are also able through high-speed trial and error to eventually reach a cooperative equilibrium. Even when an infinite number of anti-competitive prices can be sustained, it is also likely that self-learning algorithms can more easily determine the price that maximises joint profits and which harms consumers the most.

They query whether the concept of agreement needs revisiting in light of the role of algorithms in reaching and enforcing a common policy, some have raised the question of whether the concept of agreement should be revisited in order to incorporate other "meetings of minds" that are reached with the assistance of algorithms, stating signaling algorithms might result in very fast iterative change of prices that eventually converge to a

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Committee on the Financial Aspects of Corporate Governance and Gee and Co. Ltd. London. UK. Retrieved from cadbury.pdf (ecgi.global) (Accessed 12 May 2021)

common value, resembling an actual negotiation process between businessmen to implement a collusive agreement asking if it could be concluded that the fast adjustment of prices in reaction to competitors until convergence is reached is tantamount to an agreement? They also referenced parallel algorithms again as potentially being seen as an alternative automatic mechanism to implement an agreement and reflect on accountability, agreement, and collusion.

> For instance, in a "follow-the-leader" strategy, a firm could make an offer to collude by implementing an algorithm that imitates in real-time the price of the market leader, while the leader could accept the offer by increasing the price in reaction to the competitor's algorithm. Alternatively, a firm may make an invitation to collude by publicly releasing a pricing algorithm, while competitors would accept the offer by using the same algorithm as part of their business strategy.

And they reflect on the concept of transparency of complex algorithms where machine learning has made autonomous decisions:

> The sensible reaction to demand for more transparency about how these algorithms work may not achieve the intended purpose, as making these complex algorithms fully transparent can be extremely challenging. Merely publishing (or disclosing to a regulator) the source code of the algorithm may not be a sufficient transparency measure. Complete transparency would require that someone could explain why any particular outcome was produced, but that might be an impossible task when machine learning systems have made autonomous decisions that have not been instructed by anyone.148

Are accountant annual declarations of compliance with their institutes' code of ethics sufficient? Should there be mandatory ethics training by all institutes, accountancy and for non-accountants developing, using, or planning to use AI systems? There are global

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148 OECD., (2017). *Algorithms and Collusion: Competition Policy in the Digital Age* Pages 31, 22, 38, 48. OECD, Paris, France, Retrieved from: www.oecd.org/competition/algorithms-collusion-competition-policy-in-the-digital-age.htm (Accessed 12 May 2021)

entities who are more specific in the Codes of Ethics in relation to AI, algorithmic transparency, and accountability. The United States Association for Computational Mechanics (USACM)'s principles for algorithmic transparency and accountability are set out in their Statement on Algorithmic Transparency and Accountability and these are noted as designed to be consistent with their Code of Ethics and Professional Conduct. On 25 May 2017 USACM issued a joint statement with the ACM Europe Policy Committee (EUACM). 149

> The 7 Principles for Algorithmic Transparency and Accountability are:
>
> Principles for Algorithmic Transparency and Accountability
> 1. Awareness: Owners, designers, builders, users, and other stakeholders of analytic systems should be aware of the possible biases involved in their design, implementation, and use and the potential harm that biases can cause to individuals and society.
>
> 2. Access and redress: Regulators should encourage the adoption of mechanisms that enable questioning and redress for individuals and groups that are adversely affected by algorithmically informed decisions.
>
> 3. Accountability: Institutions should be held responsible for decisions made by the algorithms that they use, even if it is not feasible to explain in detail how the algorithms produce their results.
>
> 4. Explanation: Systems and institutions that use algorithmic decision-making are encouraged to produce explanations regarding both the procedures followed by the algorithm and the specific decisions that are made. This is particularly important in public policy contexts.

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149 ACM., (2018 updated 2021). *ACM Code of Ethics and Professional Conduct* Adopted 6/22/18. New York, USA. Retrieved from https://ethics.acm.org/. *This Code and its guidelines were adopted by the ACM Council on June 22nd, 2018. The Preamble was amended on October 22, 2021, to reflect changes in ACM award policies.*

*USACM Issues Statement on Algorithmic Transparency and Accountability* 12 January 2017. Retrieved from USACM Issues Statement on Algorithmic Transparency and Accountability USACM *7 Principles for algorithmic transparency and accountability* Retrieved from 7 Principles for algorithmic transparency and accountability Copyright (c) 2018 by the Association for Computing Machinery. (All accessed 12 May 2021).

5. Data Provenance: A description of the way in which the training data was collected should be maintained by the builders of the algorithms, accompanied by an exploration of the potential biases induced by the human or algorithmic data-gathering process. Public scrutiny of the data provides maximum opportunity for corrections. However, concerns over privacy, protecting trade secrets, or revelation of analytics that might allow malicious actors to game the system can justify restricting access to qualified and authorized individuals.

6. Auditability: Models, algorithms, data, and decisions should be recorded so that they can be audited in cases where harm is suspected.

7. Validation and Testing: Institutions should use rigorous methods to validate their models and document those methods and results. In particular, they should routinely perform tests to assess and determine whether the model generates discriminatory harm. Institutions are encouraged to make the results of such tests public. 150

Is it sufficient to only loosely reference AI under 'technologies', or should financial frameworks and codes of ethics for accountants specifically reference AI in the way the USACM does?

#### 2.4.1.3 Stakeholder interaction and communication

The IFAC has 173 members and their adoption of international financial standards, and of international public sector specific standards is set out below, and of the 130 members who have adopted these standards, the regional split take-up is Africa, 24, Americas and Caribbean 25 Asia-Pacific 23 Europe 48 Middle East 10 total 130.151

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150 UASCM., (2018). *ACM Code of Ethics and Professional Conduct* Adopted 6/22/18. New York, USA. ACM Europe Council: Retrieved from USACM *7 Principles for algorithmic transparency and accountability* 2017_joint_statement_algorithms.pdf (acm.org) (Accessed 12 May 2021)

151 IFAC., (2019). *International Standards, 2019 Global Status Report.* Pages 14, 17. Switzerland. USA. Retrieved from

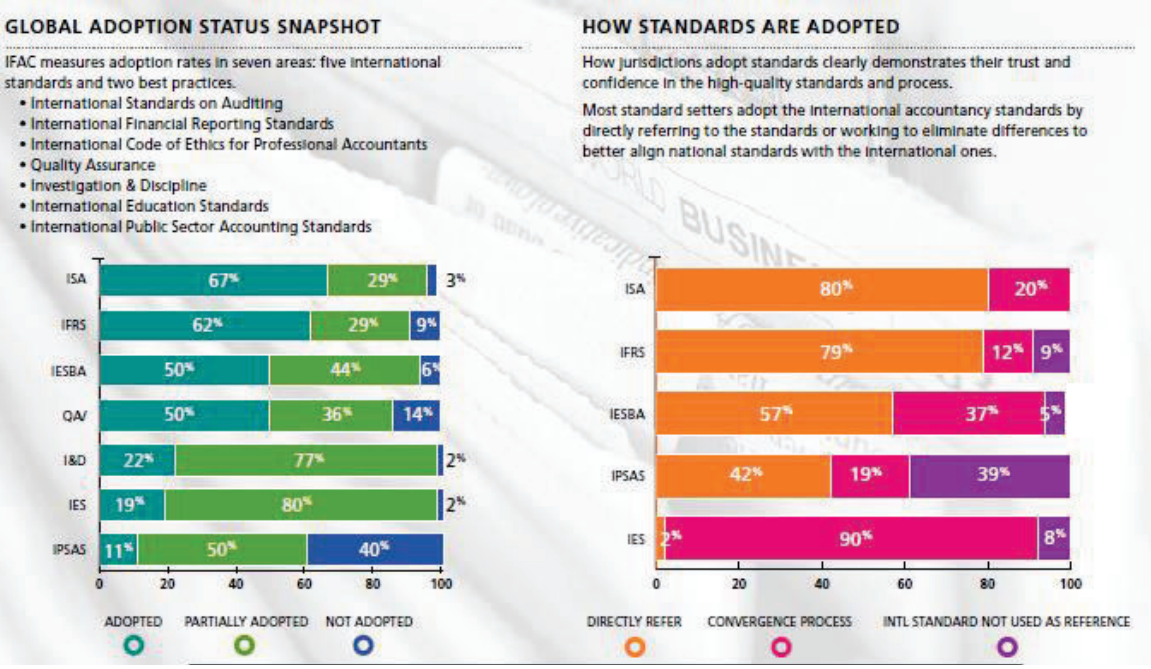


**Figure 2.9: Take up of International Standards as reported by the IFAC (2019)**

The IFAC report that 90% of IFAC member jurisdictions apply technical standards applicable in financial statements and audits and use the International Code of Ethics for Professional Accountants, issued by the International Ethics Standard Board for Accountants,152 highlighting that in jurisdictions where English is not an official or a business language that 45% of IFAC members are involved in translation of the International Code of Ethics. They highlight that adoption and implementation frequently

https://www.ifac.org/system/files/publications/files/IFAC-International-standards-2019-global-status-report.pdf (Accessed 12 May 2021)

152 IFAC., (2020). *Handbook for the International Code of Ethics for Professional Accountants including International Independence Standards.* Switzerland. USA. Retrieved from *https://www.ifac.org/system/files/publications/files/IESBA-English-2020-IESBA-Handbook_Web-LOCKED.pdf* (Accessed 12 May 2021)

require years of advocacy, education, outreach, and coalition building noted their educational role re Ethics also providing a comprehensive list of 130 countries and their uptake of the International Code of Ethics.153

What is the accountants' advocacy role today for AI?

#### 2.4.1.4 AI Guidelines and the links with Financial Codes

Hagendorff, T. (2019) reviewed 22 of the major AI ethics guidelines using Algorithm Watch's AI Ethics Guidelines Global Inventory in 2019154 a crowdsourced list of ethics guidelines and concludes that AI ethics is failing in many cases, that deviations from ethics codes have no consequences, that a transition is required to a situation-sensitive ethical approach, based on virtues and personality dispositions, also knowledge expansions, responsible autonomy, and freedom of action. He included the OECD Principles on AI in his review, noting that this was due to their supranational character. He observes following the review that there are two considerations for AI ethics, a stronger focus on technological details of the various methods and technologies in AI and in

153 IFAC. (2019). *International Standards, 2019 Global Status Report.* Pages 4, 5, 10. Switzerland. USA. Retrieved from https://www.ifac.org/system/files/publications/files/IFAC-International-standards-2019-global-status-report.pdf (Accessed 12 May 2021)

154 Haas, Leonard., Gießler, Sebastian., Thiel, Veronika., (2021). *In the realm of paper tigers, exploring the failings of AI ethics guidelines.* Berlin, Germany. Retrieved from https://algorithmwatch.org/en/ai-ethics-guidelines-inventory-upgrade-2020/
© AlgorithmWatch 2021. Algorithm Watch ethics guidelines inventory. Original 2019 inventory retrieved from: "Ethical AI guidelines": Binding commitment or simply window dressing? - AlgorithmWatch (Accessed 12 May 2021)

machine learning is needed, and AI ethics need to focus more strongly on genuinely social and personality-related aspects. He states 22 guidelines he reviewed were relatively ineffective.155

Haas, L., Gießler, S. and Thiel, V., (2021) review of the Algorithm Watch, updated list noted that the 160 guidelines included in the inventory mostly come from the wealthy countries of the OECD and that voices from the global south have been poorly represented, that AI Ethics guidelines lacked enforcement mechanisms, that the private sector, government initiatives and civil society are 'more or less' evenly represented. They noted, that only seven of the ethics guidelines had enforcement mechanisms that private sector relies heavily on voluntary commitments, that state actors mainly make recommendations to administrative bodies that many guidelines wording plays down the scope of the document and present the guidelines as an 'orientation aid' or 'proposal'. They state that many of the ethics guidelines were statements of principles without a clear view on how they are to be applied in practice and as such that they are not suitable as a tool against potential harmful uses of AI-based technologies. They state ethics guidelines should not be only a Public Relations (PR) tool for companies and government. They question whether having guidelines that cannot be applied or enforced are more harmful than having no ethical guidelines at all. 156

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155 Hagendorff. Thilo., (2019). *The Ethics of AI Ethics: An Evaluation of Guidelines* Pages 99, 101, 113, 114, 115. March 2020. Published in Minds and Machines Minds and Machines (2020) 30:99–120, DOI:10.1007/s11023-020-09517-8 Received: 1 October 2019 / Accepted: 21 January 2020 / Published online: 1 February 2020. © The Author(s) 2020

156 Haas, Leonard., Gießler, Sebastian. Additional research by Thiel, Veronica., (2021). *In the realm of paper tigers, exploring the failings of AI ethics guidelines.* Berlin,

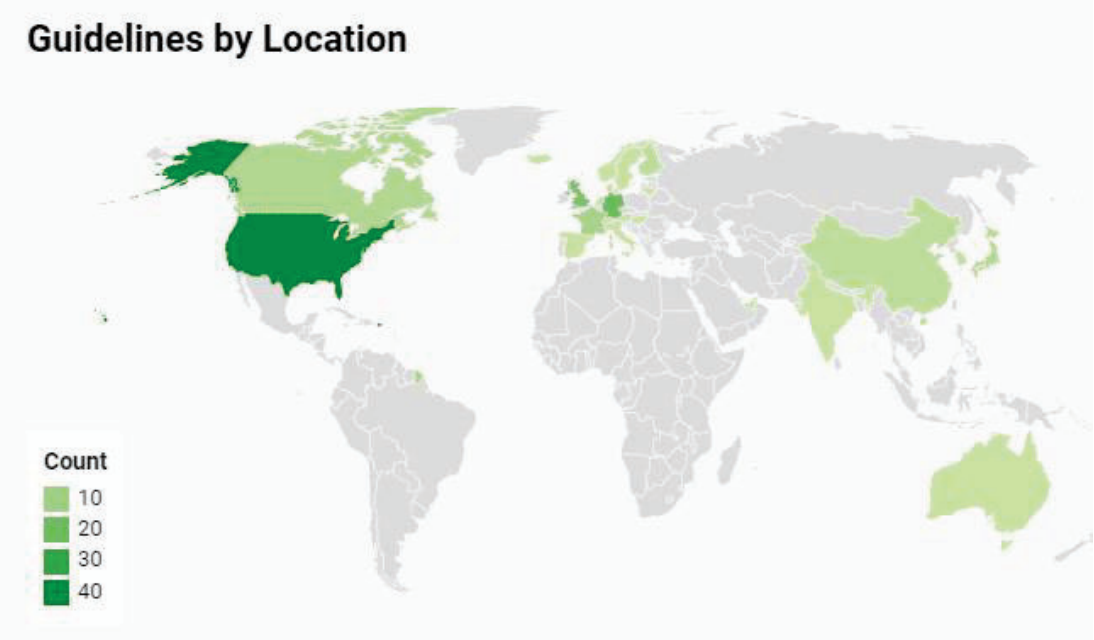


**Figure 2.10: Ethics Guidelines Voices from non-OECD countries are poorly represented by Haas, L., Gießler, S., Thiel, V., Algorithmwatch (2020)**

Jobin, A. et al. (2019) researched the global landscape of AI ethics guidelines, 'revealing a global convergence emergency around five ethical principles (transparency, justice and fairness, non-maleficence, responsibility and privacy)', and emphasizes 'the importance of integrating guideline-development efforts with substantive ethical analysis and adequate implementation strategies. They referenced 84 ethics documents from private and public sector, and they identified 11 overarching ethical values and principles, transparency, justice and fairness, non-maleficence, responsibility, privacy, beneficence, freedom and autonomy, trust, dignity, sustainability and solidarity. They highlighted a significant semantic and conceptual divergence in how these principles were interpreted. They stated that no single ethical principle was explicitly endorsed by all existing

Germany. Retrieved from https://algorithmwatch.org/en/ai-ethics-guidelines-inventory-upgrade-2020/ © AlgorithmWatch 2021. Algorithm Watch ethics guidelines inventory.

guidelines. They also noted that the themes of sustainability and solidarity were not well represented and emphasize the importance of cross-national and cross-domain harmonization over the respect for cultural diversity and moral pluralism. They noted that a language bias in their search engine query might have skewed their body of research towards English results.157

The European Union Agency for Fundamental Human Rights (2020) report emphasizes that The EU and Member States should consider targeted actions to support those developing, using or planning to use AI systems, that this is to ensure effective compliance with their fundamental rights impact assessment obligation noting that such actions could include funding, guidelines, training or awareness raising also that they should particularly – but not exclusively – target the private sector that and that Member consider using existing tools, such as checklists or self-evaluation tools, developed at European and international level.158 These include maturity models.

157 Jobin, Anna., Ienca, Marcello., Vayena, Effy., (2019). Artificial Intelligence: the global landscape of ethics guidelines Switzerland: Health Ethics & Policy Lab. Pages, 1, 2,6,7,17. (Accessed 12 May 2021)

158 European Union, European Union Agency for Fundamental Human Rights., (2020). *Artificial Intelligence and Fundamental Human Rights* Page 8. Luxembourg. Retrieved from:

https://fra.europa.eu/sites/default/files/fra_uploads/fra-2020-artificial-intelligence_en.pdf (Accessed 12 May 2021)

### 2.4.2 Maturity models and algorithm assessments

The Institute for Ethical AI and Machine Learning UK (2020) AI-RFX Machine Learning Maturity Model provides a checklist going beyond machine learning algorithms to evaluate the maturity of the infrastructure and processes around algorithms set out under the 8 principles for responsible machine learning: (1) human augmentation, (2) bias evaluation, (3) explainability by justification, (4) reproduceable operations, (6) practical accuracy, (7) trust by privacy. The Machine Learning Maturity Model (v1.0) is part of the AI-RFX Procurement Framework and is the core of all templates of their procurement framework.159

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159 Institute for Ethical and AI Machine Learning., (2020). *AI RFX Procurement Framework* UK. Retrieved from The AI-RFX Procurement Framework for AI & Machine Learning Systems (ethical.institute) also the Machine Learning Maturity Model. Retrieved from The AI-RFX Procurement Framework for AI & Machine Learning Systems (ethical.institute) Checklist 1-19. (Accessed 12 May 2021)

Note:

The AI-RFX Procurement Framework is a set of templates to empower industry practitioners to raise the bar for AI safety, quality and performance. The framework is open-source and converts the Principles for Responsible Machine Learning into a checklist which is downloadable separately. The Principles are:

1. Human Augmentation

I commit to assess the impact of incorrect predictions and, when reasonable, design systems with human-in-the-loop review processes.

2. Bias evaluation

I commit to continuously develop processes that allow me to understand, document and monitor bias in development and production.

3. Explainability by justification

I commit to develop tools and processes to continuously improve transparency and explainability of machine learning systems where reasonable.

4. Reproducible operations

I commit to develop the infrastructure required to enable for a reasonable level of reproducibility across the operations of ML systems.

ElementAI (2020) AI Maturity Framework survey of global industries, highlighted many different stages of AI maturity. They used their 5 stages of AI maturity model which was designed to help all organisations put their own AI capabilities in context. The stages are (1) Exploring (2) Experimenting, (3) Formalizing, (4) Optimizing and (5) Transforming.

The survey found that over a quarter of organisations were still trying to understand what AI means for their organisation, in the Exploring stage, that just 7% of organisations were at a level where they could reliably put solutions into production at scale. From this survey ElementAI created a purposive sample of senior-decision makers of large organisations in multiple industries in the USA and Canada to create an up-to-date snapshot of AI maturity in industry.

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5. Displacement strategy

I commit to identify and document relevant information so that business change processes can be developed to mitigate the impact towards workers being automated.

6. Practical accuracy

I commit to develop processes to ensure my accuracy and cost metric functions are aligned to the domain-specific applications.

7. Trust by privacy

I commit to build and communicate processes that protect and handle data with stakeholders that may interact with the system directly and/or indirectly.

8. Data risk awareness

I commit to develop and improve reasonable processes and infrastructure to ensure data and model security are being taken into consideration during the development of machine learning systems.

The checklist is downloadable.

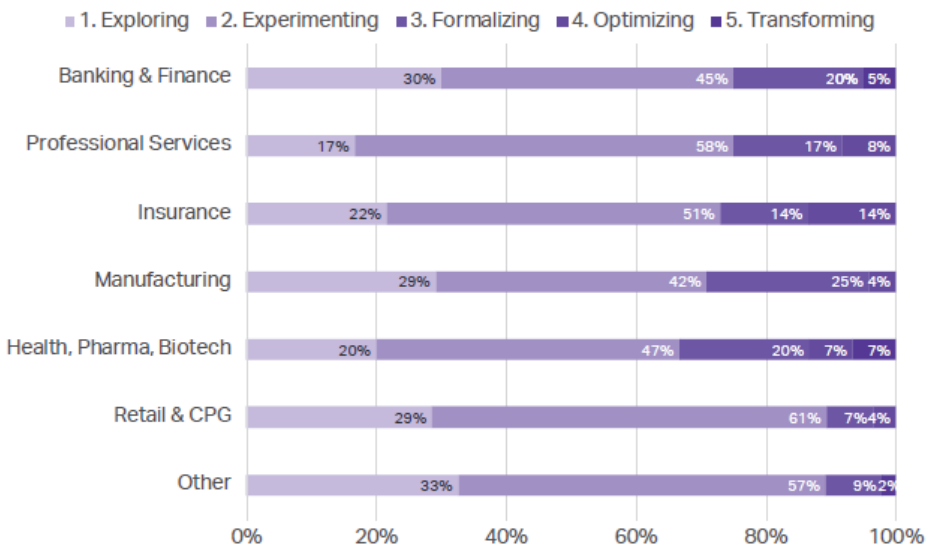


**Figure 2.11: AI Maturity Framework, the percentage of organisations in industries that have reached each stage of AI maturity ElementAI, Finland (2020)**

Their framework identifies 5 dimensions interlinked with the five stages of maturity, each of which are considered as part of the overall assessment, (1) Strategy, (2) Data, (3) Technology, (4) People and (5) Governance and they note in respect of the people dimension that for people to successfully build and work with AI solutions, they need training, job support and meaningful inclusion in the process of designing and deploying AI solutions also that the training should address business as well as technical aspects of AI so employees can understand and help shape the organization's unique AI vision. They note for Governance (Policies, Processes and Structures to ensure Responsible and Safe AI) maturity level Transforming that there is ability to engage with the broader AI

ecosystem to help shape AI governance at the level of industry standards and best practices. There free survey is available for all to use. 160

Maturity Models are an excellent way to examine transparency and other AI maturity matters. Król, K., and Zdonek, D., (2020) examined eleven analytics maturity models noting that many organisations are aware that data analytics can bring them significant competitive advantage. They noted that a more mature analytics culture allows organisations to effectively use data in business decisions. They identified 5 levels for their analytics maturity continuum (1) descriptive analytics, (2) diagnostic analytics, (3) predictive analytics, (4) prescriptive analytics, and (5) cognitive analytics. Analytics maturity was noted as involving technologies, data management, analytics, governance, and organisational components. Their results showed that although descriptions of analytic maturity levels were available for all the organisations, a detailed description of the

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160 ElementAI (2020) *AI Maturity Framework Understanding organizational maturity for AI to reveal next-best-actions at every step.* Pages 4, 10, 11, 29. Finland. Retrieved from https://www.elementai.com/products/ai-maturity (Accessed 12 May 2021)

This report was written by Karthik Ramakrishnan, Vice President, Head of AI Strategy and Solutions, and Cory Salveson, Advisory Research and Communications Strategist, with contributions from the following: Grace Abuhamad, Cyrielle Chantry, Simon-Pierre Diamond, Phil Donelson, Lisa Ebert, Walid Koleilat, Andrew Marble, Francois Ok, Martin Ryan, Charlotte Sobolewski, Patrick Suen, Sylvain Truong and Richard Zuroff

Note: AI Maturity Framework stages each have descriptions assigned: **Exploring**: Exploring what AI is and what it can bring to your organization. The organization does not yet have an AI model or solution in production. **Experimenting**: Experimenting with Proofs of Concept (POCs) and pilots. The organization is trying to put AI into production and can do so in limited ways. **Formalizing**: Moving from POC/ pilot to an AI solution in production. Putting AI solutions into production still requires significant organizational work at this stage. **Optimizing:** Scaling AI solution deployments efficiently as the number of deployed AI models increases. The organization is approaching a factory of model production. Transforming: Transforming the organization itself through the use of AI. The organization uses AI in how it operates across many critical areas of the business.

assessment process and the criteria for assigning a specific level of analytics development to an organisation was not always available, noting that this was not made available when the assessment was carried out on a commercial basis.161

Caplan et al. (2018) who argue that standards and enforcement for fairness, accountability and transparency are long overdue for algorithms, that, when an algorithm is created, it is structured by the values of its designer, that after it is created it must be trained, providing it with large amounts of data on past decisions, to teach it how to make future decisions, noting that much of the processes to obtain data, to aggregate it, and make it into digital profiles, and apply it to individuals, are corporate trade secrets, also, without enforceable mechanisms of transparency, auditing and accountability, little is known about how decision-making limits or impedes civil rights.162

The Centre for Data Ethics and Innovation, (CDEI) United Kingdom, (UK) (2020) review into bias in algorithmic decision making also highlighted the urgent need for the world to do better in using algorithms in the right way, to promote fairness and not to undermine it, stating algorithms, like all technology should work for people, and not against them. Four sectors were assessed in their review, recruitment, financial services,

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161 Król, Karol., and Zdonek, PSCiusz., (2020) *Analytics Maturity Models: An Overview* Pages 1,2,13. Authors Poland. Published by the Multidisciplinary Digital Publishing Institute (MDPI) Basel, Switzerland. Retrieved from: https://www.mdpi.com/2078-2489/11/3/142 also at MDPI 2020, 11(3), 142; https://doi.org/10.3390/info11030142 Article received: 17 December 2019, Revised: 26 February 2020, Accepted: 28 February 2020. Published: 2 March 2020 (Accessed 12 May 2021) Note: *About MDPI* MDPI | About (Accessed 12 May 2021)

162 Caplan, Robyn., Hanson, Lauren., Donovan, Joan., Matthews, Jeanna., (2018). *Algorithmic Accountability: A Primer.* USA. Washington Data&Society Pages 2-3, 25. Retrieved from Data & Society — Algorithmic Accountability: A Primer (datasociety.net) (Website accessed 13 May 2021, document downloaded previously.)

policing and local government and their recommendations to government, regulators, organization leaders and boards, are cross-cutting.163

La Plante, A. (2019) states AI has begun to replace or augment decision-makers across financial institutions for tasks such as fraud detection, risk management, customer interactions such as loan approval and wealth advisory, noting the systems lack of interoperability in financial institutions hinders analysts from detecting discrimination against certain classes of people. LaPlante notes that algorithmic bias does not arise spontaneously, that is a product of biased training data or biased programming, that there are a number of ethics-related risks surrounding AI and machine learning, including reputational, legal and operational risk for institutions that merit careful consideration by any financial institution considering using these technologies to enhance their capabilities, noting however that few, if any, can afford to sit back and ignore these new technologies.164

### 2.4.3 Human involvement in AI-augmented decision-making

O'Connor, R. V. and Lepmets. M., (2015) note that choosing an appropriate software development process is a complex and challenging task and advocate the use of

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163 Centre for Data Ethics and Innovation., (2020). *Review into bias in algorithmic decision making.* Pages 3, 7, 8. UK Retrieved from: CDEI publishes review into bias in algorithmic decision-making - GOV.UK (www.gov.uk) (Accessed 13 May 2021)

164 La Plante, Alex., of Global Risk Institute in Financial Services., (2019). *Ethics and Artificial Intelligence in Finance.* Global Risk Institute in Financial Services (GRI), Toronto. Canada. Pages 1, 4, 5, 6, 9. Retrieved from: Ethics & Artificial Intelligence in Finance | Global Risk Institute : Global Risk Institute © 2019 Global Risk Institute in Financial Services (GRI) (Accessed 13 May 2021).

the Cynefin Sensemaking Framework to inform software development approach decisions noting that the Cynefin decision framework supports choosing the right process for the given situational context.165

Yoon, S., (2020) noted Korean companies transformed by accounting based on new technologies noting the role in management accounting, in addition to being used in financial accounting and auditing, also highlighting that accountants and accounting experts will need to study how the interface with the core AI-based technologies can be applied to strategic analysis and decision-making accounting.166

Chao, F., (2020) noted that AI use in the accounting field has brought great chances and challenges to the financial work noting that AI use resulted in high accuracy, high speed and almost no fatigue, and allowing financial personnel where financial AI RPA is in place, use the accurate data provided by AI in partnership with their experience and focus on participating in planning and decision-making, implementing enterprise strategy

165 O'Connor, Rory. V., and Lepmets, Marion., (2015). *Exploring the Use of the Cynefin Framework to Inform Software Development Approach Decisions.* Pages 97-101. Tallin, Estonia. **Publication:** ICSSP 2015: Proceedings of the 2015 International Conference on Software and System Process August 2015. https://doi.org/10.1145/2785592.2785608 Retrieved from: Exploring the use of the cynefin framework to inform software development approach decisions | Proceedings of the 2015 International Conference on Software and System Process (acm.org) (Accessed 13 May 2021)

166 Yoon, Sora., (2020). *A study on the Transformation of Accounting Based on New Technologies: Evidence from Korea.* Page 22. Ajou University, Suwon 16499, Korea, Retrieved from Sustainability **2020**, 12(20), 8669; **https://doi.org/10.3390/su12208669** (Accessed 13 May 2021)

in financial management, also continuously improving management, analysis of, decision-making and evaluation capabilities.167

The Financial Services Agencies (FSA) "Open Policy Lab" (2019) examined whether ‘technologies including AI which could be used to effectively and efficiently examine annual reports noting the public interest in annual reports. They sought to establish whether ‘AI, instead of a human, could judge if descriptions in annual reports were good or bad’, whether AI could read descriptions of specific items in annual reports,’ ‘if AI could find similar features in other annual reports’ A human judged and classified annual reports under three headings, ‘best practice’, ‘need to improve’, and ‘other’ the research was intended to determine if it was ‘possible for AI to make the same judgements and classifications as humans’, tested ‘by making the AI learn about annual reports and the data examples classified by the FSA’. 20 Companies reports’, Information & Communication (8), Think tanks (1), AI ventures/AI start-ups (6), Disclosure/IR (1) and Accounting firms (2) KPMG AZSA, EY Advisory and Consulting were tested circa 4,300 companies (mainly listed companies) and circa 4,700 investment funds. Their overall insights were:

> “**Progress of NLP [natural language processing]technology:** Though narrative information is much more difficult to read and analyze by computer than financial information in general, the companies participating in the project achieved reasonably good results using various approaches. This result suggests that **text information could be widely analyzed precisely and in large quantities by AI** thanks to the progress of natural language processing (NLP) technology.

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167 Chao, Fu., (2020). *Coping strategies of financial work in the era of artificial intelligence* Pages 1-5. IOP Publishing Ltd, Shangri-La, China Journal of Physics: Conference Series, Volume 1682, 2020 International Conference on Machine Learning and Computer Application 11-13 September 2020, Shangri-La, China **Citation** Fu Chao 2020 Journal of Physics: Conference Series**1682** 012085 (Accessed 13 May 2021)

**Possibility of AI:** Many companies emphasized that it was vital to develop AI **jointly with the person who judged the evaluations of descriptions**.

**Role of Humans and AI** Now AI is not all-in-one. As humans and AI have their own areas of expertise, **it is important for humans and AI to play their own roles** to achieve better performance. Humans should provide their judgment and knowledge to AI as well as interpretation of the results and feedback.168

The Financial Reporting Council (FRC) United Kingdom (UK), (2019) high level overview of key AI and related technologies explores the potential for AI in corporate reporting production and annual report creation, they noted that there are already use cases for production, distribution, and consumption of reporting. They concluded AI has the potential and will, in time be the actuality of corporate reporting and highlight the potential for AI to fully automate human judgement.169

168 Financial Services Agency., (2019). *Use of AI in examining annual reports Summary of the proof-of-concept test results.* Slides 1, 2, 3, 4, 17. Financial Services Agency "Open Policy Lab" Tokyo. Japan. Retrieved from https://www.fsa.go.jp/en/news/2019/20191223/20191223.html (Accessed 13 May 2021)

169 Financial Reporting Council (FRC)., (2019). *Artificial Intelligence and corporate reporting; How does it measure up?* Pages 1, 10, 11. FRC, London, U.K. Retrieved from: https://www.frc.org.uk/getattachment/e213b335-927b-4750-90db-64139aee44f2/AI-and-Corporate-Reporting-Jan.pdf (Accessed 13 May 2021)

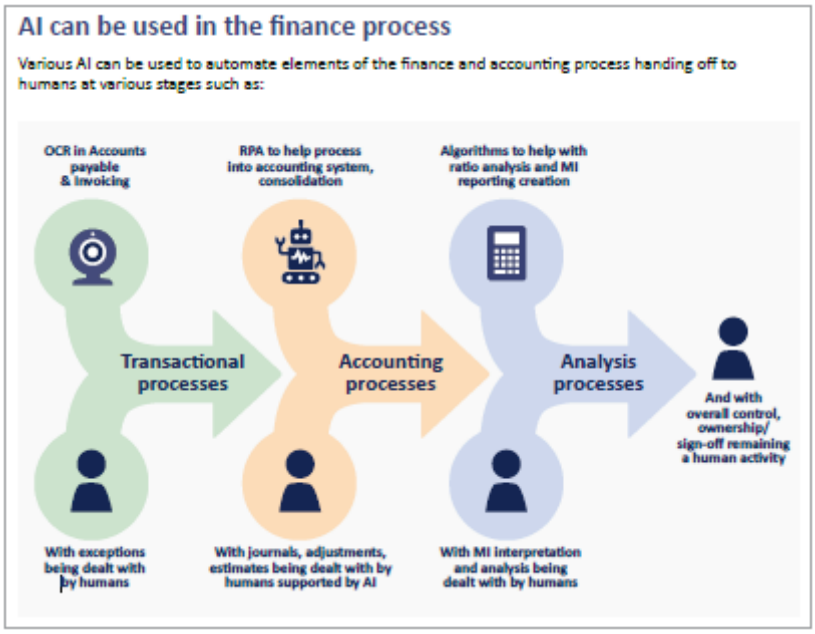


**Figure 2.12: AI Automating the Finance Process by the Financial Reporting Council, UK (2019)**

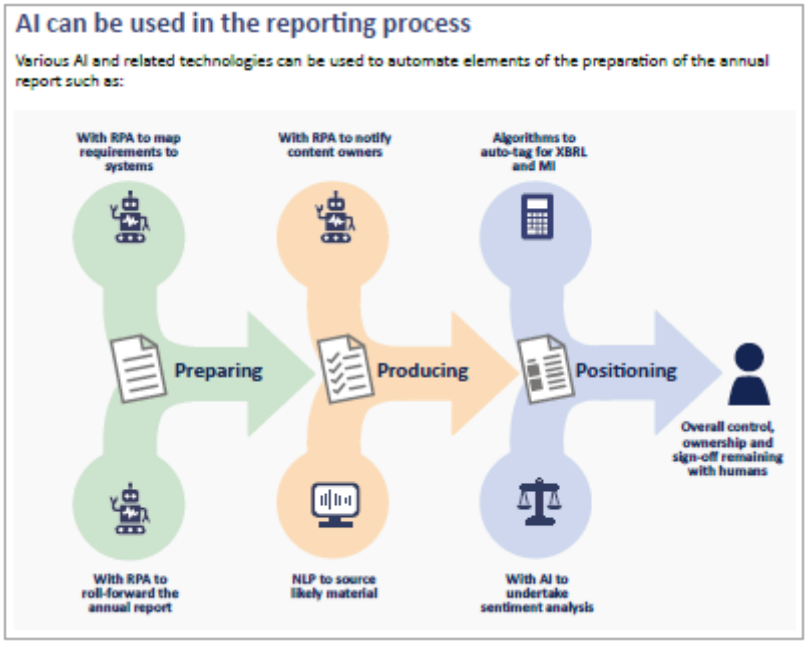


**Figure 2.13: AI and the production of corporate reporting by the Financial Reporting Council, UK, (2019)**

Since then, AI produces financial accounting software for example Jabatax Ltd (2021) is described Generally Accepted Accounting Principles (GAAP) and International Financial Reporting Standards (IFRS) compliant, 'continuous renewal multi-GAAP', contains all the functions required for the creation of financial reports, including financial accounting of transactions covering the entire life-cycle of financial and non-financial instruments, that the embedded Accounting Rules Engine generates journal entries for all accounting transactions, that financial statements and notes are supported that IFRS accounting logic and that the standard chart of accounts are preconfigured and that the IFRS valuation of financial instruments, calculations for impairment and hedge management and consolidation with multi-currency capability are available.170

Stein Smith, S., (2018) highlights the concept of continuous accounting, commenting on AI, blockchain and other technologies, he stated that a critical flaw in the current financial reporting processes, is that data and information are not available in a secure and continuous manner but that technology is enabling this now, noting that there appears to be a gap between accounting, technology professionals and end users, that automation, and the move towards continuous accounting and real-time information will mean the accounting workforce will need improved training and that the accounting education system needs to embed the new concepts and technologies into the curriculum

170 Jabatix Ltd., (2021). *Continuous Renewal. Banking Platform.* Paragraphs 1, 2, 3, 4. And webpage Paragraphs 1, 2, 3, 4. Grevenmacher, Luxembourg.
(Accessed 13 May 2021: Webpage last modified 13 January 2021) also https://www.jabatix.net/continuous-renewal.html (Accessed 13 May 2021)

to ensure accountants are aware of them and able to take advantage of emerging opportunities.171

Blackline Ltd (2021) refer to AI, RPA, and financial accounting, using the term 'Continuous Accounting' automating financial data replacing linear-to-record reporting, combining robots and people resulting in real-time reporting, improved financial accuracy and enhanced global visibility and transparency for staff and auditors regardless of location.172

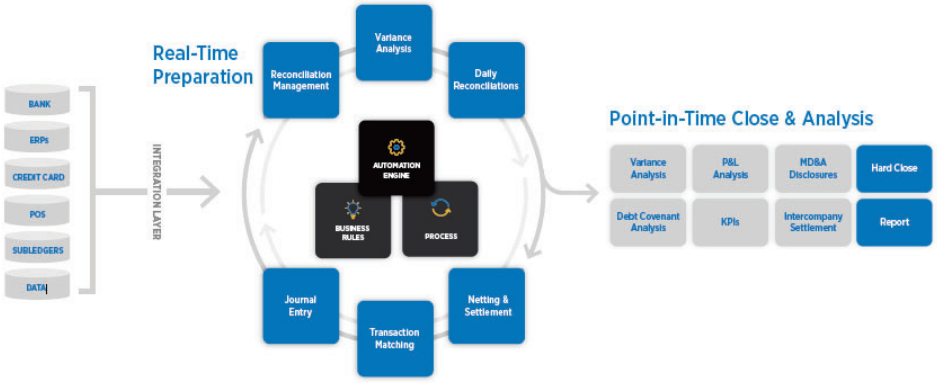


**Figure 2.14: AI, RPA, 'Continuous Accounting' by Blackline Ltd (2020)**

Ding, K., Lev B., Peng, X., Sun, T., and Vasarhelyi, M. A., (2020) posit most balance sheet and income statement items are based on estimates that these estimates are

171 Stein Smith, Sean., (2018). *Digitization and Financial Reporting – How Technology Innovation May Drive the Shift toward Continuous Accounting* Pages 240-249. Vol 7, No 3 (2018) > **Stein Smith** DOI: https://doi.org/10.5430/afr.v7n3p240

Copyright (c) 2018 Accounting and Finance Research Accounting and Finance Research ISSN 1927-5986 (Print) ISSN 1927-5994 (Online). Retrieved from: http://www.sciedu.ca/journal/index.php/afr/article/view/13762 (Accessed 13 May 2021)

172 Blackline Ltd., (2020). *Continuous Accounting: The Modern Approach to Closing the Books.* Pages 1-8. E-Book. Blackline Ltd Woodland Hills, California, USA. Retrieved from: https://www.blackline.com/resources/whitepapers/continuous-accounting-ebook-the-modern-approach-to-closing-the-books/ (Accessed 13 May 2021)

affected by estimate errors and human manipulation which impacts financial reporting reliability. They show that machine learning can substantially improve estimates resulting in better financial information for investors, that machine learning techniques could be useful to managers and to auditors.173 Kaya, C. T., Turylilmaz, M., and Birol, B., (2018) examine RPA impact on transforming enterprise resource planning and materials resource planning in the scope of financial reporting systems in cost accounting processes and highlight that auditors will need to be able to audit robots.174

Muniko, I., et al. (2020) reviewed use of AI by accounting firms in risk assessment, tests of transactions, analytics, preparing audit working papers, and note that there is a growing awareness of the unintended consequences that may also arise, and forecast the ethical implications of AI use in auditing.175

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173 Ding, Kexing., Lev. Baruch., Itamar, Peng. Xuan., Sun. Ting., and Vasarhelyi, Miklos A., (May 1, 2020). *Machine Learning Improves Accounting Estimates: Evidence from Insurance Payments* Page 1. SSRN, Rochester, New York, U.S.A. Editor: Richard Sloan, Available at SSRN: https://ssrn.com/abstract=3253220 or http://dx.doi.org/10.2139/ssrn.3253220 (Accessed 13 May 2021)

174 Kaya, Can. Tansel., Turkylimaz, Mete., and Birol, Burcu (2018) *Impact of RPA Technologies on Accounting Systems* Pages 235-250, Ankara, Turkey. Retrieved from: Yeni Türk Ticaret Kanunu Kapsamında Muhasebe Mesleğini İlgilendiren Genel Düzenlemeler (dergipark.org.tr) DOI: https://doi.org/10.25095/mufad.536083 https://app.trdizin.gov.tr/publication/paper/detail/TXpRM09UazJOZz09

175 Munoko, Ivy., Brown-Liburd, Helen., Vasarhelyi Miklos., (2020). *The Ethical Implications of Using Artificial Intelligence in Auditing*. Page 1. Journal of Business Ethics U.S.A. Journal of Business Ethics volume 167, 2020, Pages 209-234. Retrieved from: (PDF) The Ethical Implications of Using Artificial Intelligence in Auditing (researchgate.net) DOI: 10.1007/s10551-019-04407-1 (Accessed 13 May 2021)

Weld, D. S., and Bansal., (2018) state that to trust AI systems the AI systems must be robust, and that the system reasoning must be intelligible, noting that this would facilitate control by humans in human/AI team collaboration, would help humans learn from AI. They also noted that there are legal reasons including the European GDPR and a growing need to assign liability when AI errs. They noted that organisations are now deploying algorithms in many mission-critical settings. 176

### 2.4.3 RPA Market-Based Multirobot Coordination and emerging business models

Dias, B., Zlot, R., Kalra. N., and Stenz, A., (2006) referenced swarm robotics, teams of robots working together as teams, bidding for work, market-based multirobot coordination.

> "as robots become an integral part of human life, we charge them with increasingly varied and difficult tasks, including, planetary exploration, manufacturing and construction, medical assistance, search and rescue and port and warehouse automation. Like humans, robots working in challenging domains can potentially perform better by working together in teams than by working alone.

They noted market-based multirobot coordination approaches distribute planning required for task allocation through an auction process, that each robot or group of robots locally plans the achievement of the offered tasks, computes its costs, and encapsulates the costs in its bids. They reference similarities between humans and robots.177

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176 Weld, Daniel. S., and Bansal, Gagan., (15 October 2018). *The Challenge of Crafting Intelligible Intelligence.* Pages 1 and 8. Washington, U.S.A. Retrieved from: *https://arxiv.org/pdf/1803.04263.pdf* (Accessed 13 May 2021)

177 Dias, M. Bernardine, Zlot, Robert., Kalra, Nidhi, Stentz, Anthony., (2006). *Market-Based Multirobot Coordination: A Survey and Analysis.* Pages, 1257, 1261, 1262. Retrieved from: 01677943-1.pdf (cmu.edu) (Accessed 13 May 2021)

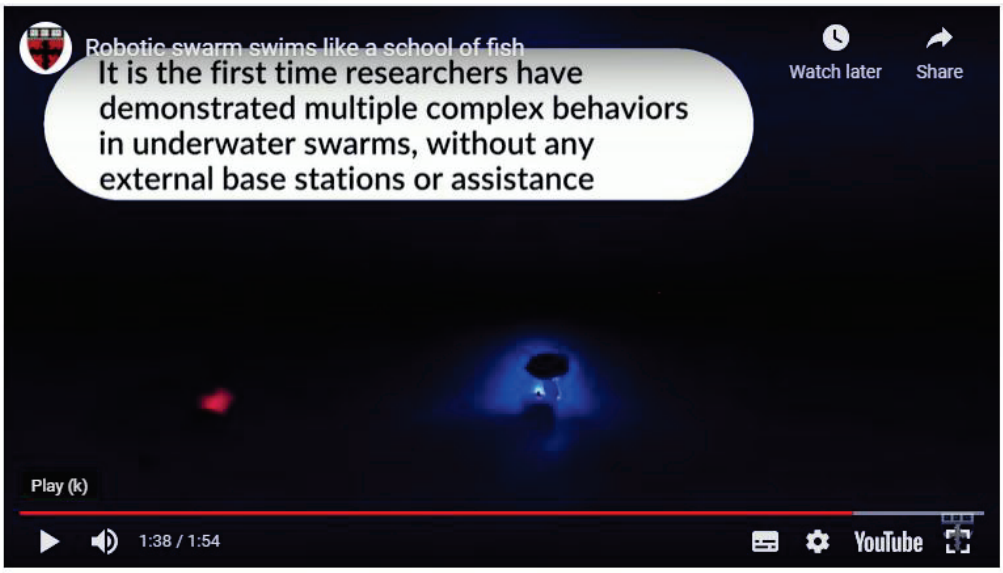


**Figure 2.15: Robot swarm swims like a school of fish by Harvard John A., Paulson School of Engineering and Applied Sciences (SEAS), and Wyss Institute for Biologically Inspired Engineering** Robotic swarm swims like a school of fish - YouTube **(2021)**

Burrows, L. (2021) states a team of researchers in the UAS have developed fish-inspired robots that can synchronize their movements like a real school of fish, done without any external control, that is the first time that researchers have demonstrated complex 3D collective behaviors with implicit coordination in underwater robots.178 The YouTube video highlights the importance of this noting that this research paves the way for future underwater swarms that can perform environmental monitoring where GPS and Wi-Fi are not available. Climate and Environmental protection and important facets of Public Policy

178 Burows, Leah., [Press Contact] Harvard John A. Paulson School of Engineering and Applied Sciences (SEAS), and Wyss Institute for Biologically Inspired Engineering (2021). *Robotic swarm swims like a school of fish.* U.S.A. Retrieved from Robotic swarm swims like a school of fish (harvard.edu) © 2021 President and Fellows of Harvard College. (Accessed 13 May 2021)

and are costed in policy business cases in Ireland which reference UN Sustainable Development goals (2018) including goal 9, 'Industry, Innovation and Infrastructure, goal 11, Sustainable Cities and Communities, and goal 13 Climate Action.179

**Figure 2.16: United Nations, 17 Sustainable Development Goals YouTube by United Nations (2018)** Do you know all 17 SDGs? - YouTube

Ferrer, E., (2017) notes how blockchain combined with robotic swarm systems, make the robotic swarm operations more secure, more autonomous, flexible, that they are 'even profitable.' He references automated transportation, logistic warehouse systems, and cloud computing as examples of uses for this technology combination. He describes an Internet of Things (IoT) swarm model relating to robot swarms and weather as relevant for

179 United Nations., (2018). *The 17 Goals*. U.N. Department of Economic and Social Affairs, Sustainable Development. Geneva. Switzerland. Retrieved from: THE 17 GOALS | Sustainable Development (un.org) (Accessed 13 May 2021)

private sector organizations citing car manufacturers needing information about road conditions, bad weather conditions, disaster relief missions, farmers and precision agriculture or aquaculture companies requiring accurate weather forecasts for larger production areas where different types of robots are, 'able to provide a global view'. He notes that two powerful blockchain techniques, hashing, and time-stamping, support an infrastructure in which robotic swarm systems follow specified legal and safety regulations as they become increasingly integrated into human society, and may result in creation of new business models for swarm operations.'180

Juiz, C., Colomo-Palacios, R., and Gómez, B., (2018) emphasize the use of Balanced Scorecard to improve board accountability, that it can be a decision support tool for boards and senior executive in private and public organisations implementing ISO/IEC 38500181, that balanced scorecard frameworks provide four different viewpoints, Financial, Customer, Internal Business Process, and Learning and Development. This ISO

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180 Ferrer, Eduardo. Castelló., (2017). *The blockchain: a new framework for robotic swarm systems.* Pages 1, 2, 9. MIT Media Lab, Cambridge. Massachusetts. USA. Retrieved from The blockchain: a new framework for robotic swarm systems (arxiv.org) (Accessed 13 May 2021)

181 International Standards Organisation (ISO) (2015) *ISO/IEC 38500:2015) Governance of IT for the Organisation.* ISO/IEC 38500:2015. Geneva, Switzerland. Retrieved from: https://www.iso.org/standard/62816.html (Accessed 13 May 2021)

The ISO website noted this ISO provides guiding principles for members of governing bodies of organizations, comprising owners, directors, partners, executive managers, or similar on the effective, efficient, and acceptable use of information technology within their organization, to those advising, informing, or assisting governing bodies, executive managers; members of groups monitoring the resources within the organization; external business or technical specialists, such as legal or accounting specialists, retail or industrial associations, or professional bodies; internal and external service providers (including consultants); auditors.

is noted as contributing to Goal 9 of the UN Sustainable Development Goals, 'Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation'. 182 183

### 2.4.4 Financial Data Ethics and Algorithmic Government conclusion

Financial governance standards and measures are outlined (IFAC (2021), European Commission (2021)), and accounting approaches (Metcalfe, A., and Sanderson, K., (2019). The mission, vision, and values of lead standard setters in the financial world including sustainability, integrity, financial expertise, transparency, sustainable economic growth, and poverty reduction also advocacy are outlines (IFAC (2021), (2020), (2013), (2010), IIA (2021), AICPCA (2021), IMA (2021), CFI (2021), IMF (2021), World Bank (2021), OECD (2021), (2019), UASCM (2018)). The blurring of lines between accountants and non-accountants in the context of AI enabled financial management is noted Hunter. A., Certified Public Accountant (CPA), Australia (2021). Interoperable public services principles are outlined (European Commission (2021), (2017)). Accountants ethical frameworks and how they relate to AI and financial data production, integration, audit and assurance highlighted a lack of specific references to AI (IFAC (2021), (2020), (2019),

182 United Nations (2018) *Sustainable Development Goal 9* (2018). U.N. Department of Economic and Social Affairs, Sustainable Development. Geneva. Switzerland. Retrieved from: THE 17 GOALS | Sustainable Development (un.org) (Accessed 13 May Retrieved from: Goal 9 | Department of Economic and Social Affairs (un.org) (Accessed 13 May 2021)

183 Juiz, Carlos., Colomo-Palacios, Ricardo., and Gómez, Beatriz., (2018) *Cascading ISO/IEC 38500 Balanced Score Cards to improve board accountability* Pages 417-424 Published by Science Direct https://www.sciencedirect.com/science/article/pii/S1877050918316922

IAASA (2021), CAI (2020), OECD (2017), Committee on the financial aspects of corporate governance and Gee and Co Ltd (The Cadbury Committee) (1992)) although there was one instance where clear links between the ethics governance framework for financial data and AI ethics were noted (UASCM (2018)).

AI ethics guidelines were reviewed and noted as being relatively ineffective (Haas. L. Gießler, S. Thiel, V. (2021) Hagendorf, T. (2019)) although guidelines had a number of principles, including transparency, justice and fairness, non-maleficence, responsibility, and privacy (Jobin. A. et al (2019) and fundamental human rights (EU Agency for Fundamental Human Rights (2020).

AI Maturity Models and Algorithmic Impact Assessments were found to be beneficial (Institute for Ethical AI and Machine Leaning UK (2020), ElementAI (2020) Król. K, Zdanek D. (2020) Caplan et al (2028), although it was noted that while AI is beginning to replace or augment decision making, bias and discrimination were matters of concern also ethics risks (Centre for Data Ethics and Innovation, 2020) (LaPlante 2019).

Although the benefits of AI use in accounting today and in corporate reporting were noted (Yoon. S., (2020), Chao. F. (2020), Financial Services Agency Japan (2019), Financial Reporting Council UK (2019), and continuous accounting and budgets were noted (Jabatax Ltd (2021), Blackline Ltd (2020), Stein Smith S. (2018), no specific links were made with ethics governance frameworks, they were made with standard setting frameworks.

The need for auditors to be able to audit AI and audit robots was highlighted (Munoko. I. Brown-Libund H. Vaserhelzi. M., (2020), Ding. K. et al. (2020), Kaya. C. T.

Turlylinex. M. Biral, B. (2018)) and human/AI team collaboration is mentioned (Weld. D. S. Bansal. G. (2018).

The increasing use of AI, swarm robotics, and blockchain is noted Burrows. L. (2021), (UN (2018), Juiz. C. Colomo-Palacias, R. Gómez B. (2018), Ferrer E. C. (2017) Dias et al., (2006)).

Overall, it appears that AI is in use for financial data, but there is not always a clearly specified link into ethics governance frameworks, and that the guidelines in place were not considered adequate.

Question 3

*Do Public Sector ethics governance frameworks for financial data incorporate AI ethics?*

## 2.5 Do Public Sector Ethics Governance Frameworks for financial data incorporate AI Ethics?

Do public sector ethics governance frameworks for financial data incorporate AI ethics?

### 2.5.1 Financial Governance structures and measures

Haas, L., Gießler, S., Thiel, V., (2020) on Algorithmwatch reported that, of the one hundred and sixty-one guidelines reviewed, 42 related to governments, 8 professional associations, 3 to intergovernmental organizations and 3 to international organizations. Comparing this with other entities with information on public sector confirms what they reported that their information is not a complete picture.184

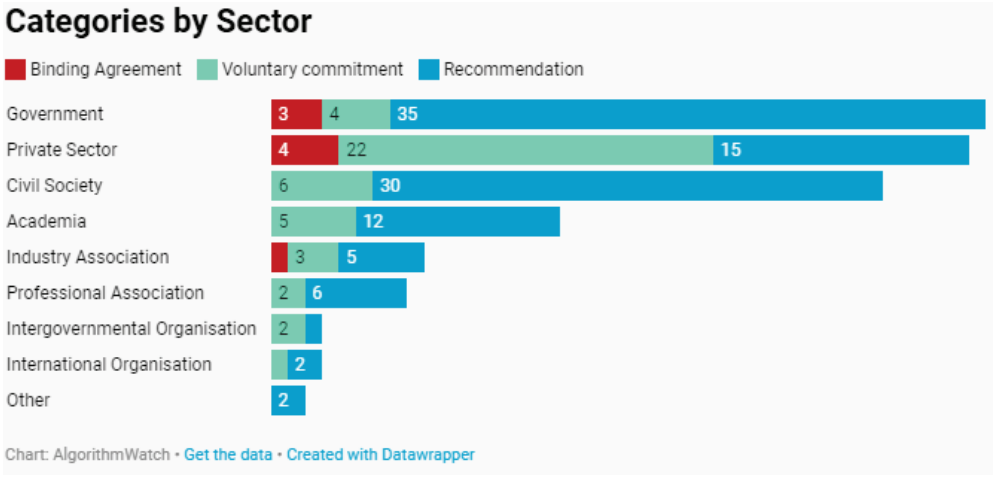


**Figure 2.17: Very few Ethics Guidelines documents have enforcement mechanisms by Haas, L., Gießler, S., Thiel, V., (2020) Algorithmwatch website**

184 Haas, Leonard., Gießler, Sebastian. And additional research by Thiel, Veronica., (2020) *In the realm of paper tigers – exploring the failings of AI ethics guidelines* Algorithmwatch Retrieved from: In the realm of paper tigers – exploring the failings of AI ethics guidelines - AlgorithmWatch (Accessed 13 May 2021)

Contributions were reviewed from the UN, OECD, World Economic Forum, European Commission, European Parliament, HELG, The Canadian government, China government, Monetary Authority of Singapore, Alan Turing Institute, and other contributors, for example the Pontifical Academy for Life Rome. Guidelines by the IFAC and IMF were not recorded on the list.185

To obtain a picture of the financial ethics standards in public sector, the IMF report on Government Finances in relation to 194 countries and areas globally.186 Every public sector body has financial, ethical standards, and other, guidelines, in their governance frameworks. Are AI ethics included in those financial frameworks? Have all the financial frameworks been examined?

185 Haas, Leonard., Gießler, Sebastian. And additional research by Thiel, Veronica., (2020) *ethics guidelines Global Inventory at April 2020* Algorithmwatch Retrieved from: AI Ethics Guidelines Global Inventory (algorithmwatch.org). (Accessed 30 May 2021; Last update April 2020)

186 IMF., (2021). *International Finance Statistics.* IMF. Washington, U.S.A. Retrieved from: https://data.imf.org/?sk=4c514d48-b6ba-49ed-8ab9-52b0c1a0179b&sId=1438865921483 as noted on their website updated 05/10/2021 visited 13/05/2021. (Accessed 13 May 2021).

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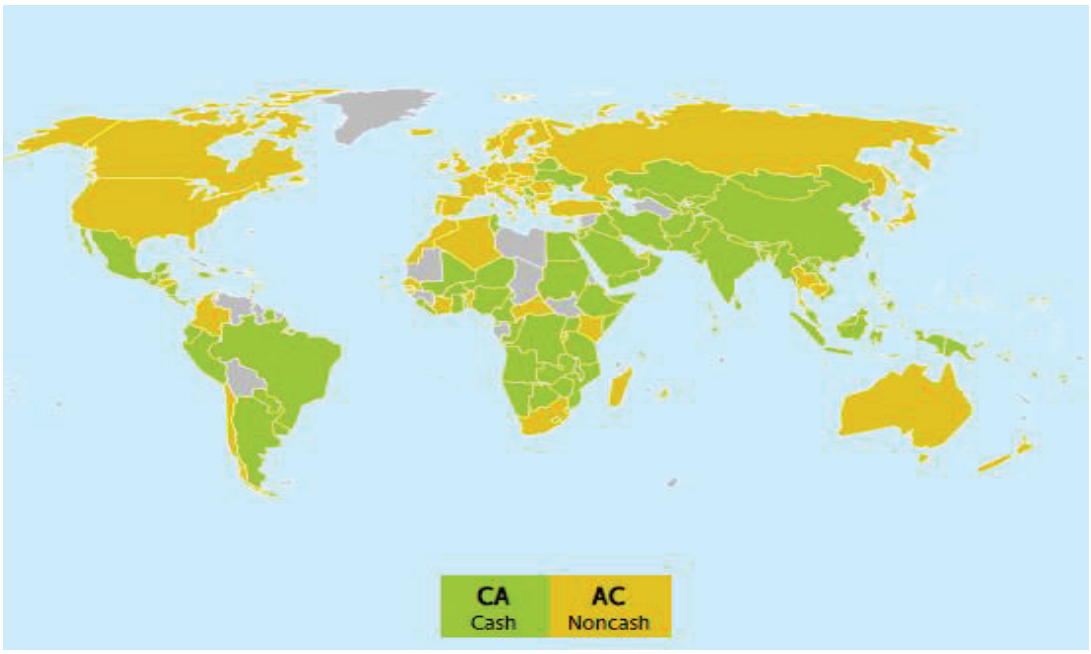


**Figure 2.18: Government Finance Statistics at 29/03/2021 as reported by the IMF (2021)**

Are the guidelines mapped to the IMF? Is there a difference in the financial frameworks, if cash accounting, accrual accounting, or a modified version of either basis is used?

They report statistical information which is sourced from governments, on a harmonized basis a cash basis or accrual basis or commitment basis187 using a manual which sets out the financial framework for these statistics.188

187 IMF., (2021). *Government Finance Statistics website* Image: *Government Finance Statistics.* IMF Washington, U.S.A Retrieved from: Image Government Finance Statistics - About GFS - IMF Data. As noted on their website updated 05/01/2021 visited 13/05/2021. (Accessed 13 May 2021)

188 IMF., (2014). *Government Finance Statistics Manual* 2014. Page 68. IMF Washington, U.S.A. Retrieved from:

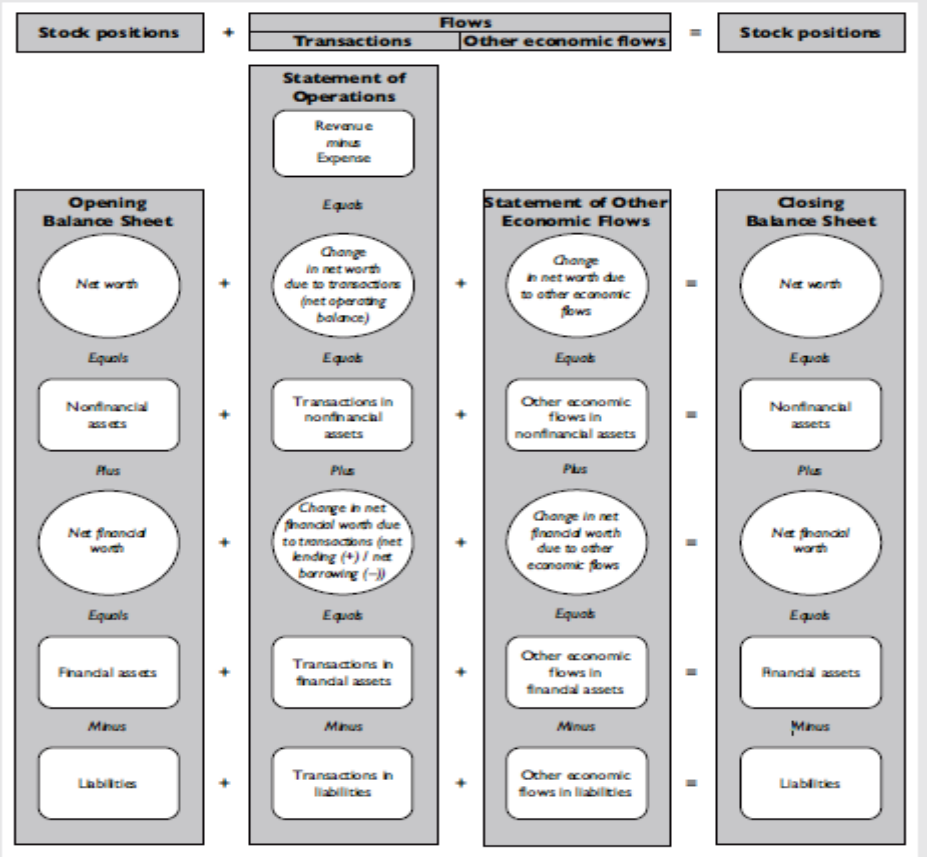


**Figure 2.19: Government Finance Statistics analytic framework 2014 applied reporting global finance statistics to the and by the IMF (2021)**

Stewardship of public funds is a key standard for all public sector staff, accountants, auditors, and non-accountants. Public sector is also bound by other, equally important, codes of ethics and standards for financial matters.

Vergez, C., OECD (2007) reporting on OECD Principles for Managing Ethics in the Public Service state their aim to ensure high standards of conduct in the public service

https://www.imf.org/external/Pubs/FT/GFS/Manual/2014/gfsfinal.pdf (Accessed 13 May 2021) also at Government Finance Statistics - Search - IMF Data (Accessed 13 May 2021)

by identifying, communicating, inculcating, monitoring, and rewarding ethical conduct, and by detecting, investigating and punishing misconduct.189

In Ireland public servants with specified roles and elected representatives are bound by a Code of Ethics issued by the Standards Commission in Public Office (SIPO) who oversee ethics, electoral, state finance and lobbying legislation.190 The financial governance frameworks are more extensive and include ethics observations for example, the Public Financial Procedures. All public servants must comply with the ethics principles set out in Public Financial Procedures191 (colloquially known as the blue book) and since 2013 through the Public Spending Code, every public servant, public sector company, and bodies responsible for managing public funds must comply with both the Public Spending Code and Public Financial Procedures.192

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189 Vergez, Christian, Head, Integrity and Innovation Division, Public Governance and Territorial Development of the OECD., (2007). *An integrity framework for the Public Service* Slide 6. Presented at the Global Forum, Fighting Corruption and Safeguarding Integrity, Against Corruption, held at Sandton, Gauteng, South Africa, on 04 April 2007, Retrieved from https://www.powershow.com/view2b/7bf955-MTZmM/An_Integrity_Framework_for_the_public_service_powerpoint_ppt_presentation (conference date and location) the Slides are available at: http://www.sigmaweb.org/countries/39305382.pdf (Accessed 13 May 2021)

190 Ireland, Standards in Public Office (SIPO) Commission., (2021). *Standards in Public Office (SIPO) Commission website*. Retrieved from https://www.sipo.ie/ (Accessed 13 May 2021)

191 Ireland, DPER., (2019). *Public Financial Procedures Government Accounting website.* Retrieved from: *https://govacc.per.gov.ie/public-financial-procedures-booklet-by-section* (Accessed 13 May 2021)

192 Ireland DPER (October 2018) *Public Spending Code.* Page 4. Retrieved from the consolidated PSC version October 2018 Public-Spending-Code-Consolidated-Document-Checklist-updated-Oct-2018.pdf (per.gov.ie) (Accessed 13 May 2021)

Although SIPO standards apply to designated persons, Public Financial Procedures have additional ethics obligations for all civil servants for example, Section C Procedures and Practices in Government Accounting subsection 19 **The Civil Service Code of Standards and Behaviour193,** which sets out the rules surrounding the receipt of gifts by civil servants, states: The Prevention of Corruption Acts, 1889 to 2001, as amended by the Ethics in Public Office Act, 1995, provide that the corrupt giving of gifts to, or receipt of gifts by, civil servants is:

> "a criminal offence, punishable by imprisonment or fine or both. The Acts provide that money, gifts or other consideration received by a civil servant from a person holding or seeking to obtain a contract from a Government Department/Office is deemed to have been received corruptly, unless the contrary is proved."194

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Note the more detailed text on page 4 says:

All Government Departments and public bodies and all bodies in receipt of public funding must comply, as appropriate, with the relevant requirements of the Public Spending Code. In the case of State Companies, the Board of each must satisfy itself annually that the Company is in full compliance with the Code.

Nothing in the Public Spending Code should be taken as precluding Government or Ministers, under the delegated sanction arrangements set down by the Minister for Public Expenditure & Reform, from deciding to approve projects independent of the detailed application of the Public Spending Code. Such decisions still require Departments to ensure that best practice is adhered to as regards public financial procedures generally, in terms of ensuring that necessary terms and conditions are applied to secure full accountability and transparency for the funds concerned.

193 Ireland, SIPO (2008) *Civil service Code of Standards and Behaviour*. SIPO, Dublin, Ireland. Retrieved from civil service codes.09.08.qxd (sipo.ie) (Accessed 13 May 2021)

194 Ireland, DPER., (2019). *PFP, Section C, Procedures and Practices in Government Accounting.* Page 73. DPER, Dublin, Ireland. Retrieved from SECTION C (per.gov.ie) (Accessed 13 May 2021)

DPER (2019) emphasizes that the PSC requires all Irish Public bodies to treat public funds with care also ensure that the best possible value-for-money is obtained whenever public money is being spent or invested'195.

Berryhill J., et al, OECD (2019) highlight how AI is transforming the everyday lives of citizens and public sector noting that the public sector is also charged with setting national priorities, investments and regulations when it comes to AI, that AI can be integrated into the entire policy-making and service design process and that if done well, automated processes can assist government to make decisions that are more fair and accurate than was previously online. The report evaluates AI strategies and the extent to which they include public transformation.196

OECD statistics on public transformation are updated on their Observatory of Public Sector Innovation (OPSI) website. They highlight that in addition to how rapidly AI is transforming people's lives that the public sector is also being transformed and, that public sector is also charged with setting national priorities, investments and regulations when it comes to AI. They noted that governments are signaling their commitment to AI through the release of national AI strategies, or comparable guiding policies that sets forth

195 Ireland, DPER., (2019). *The Public Spending Code* as noted on the website. Retrieved from Public Spending Code | (per.gov.ie) (Accessed 13 May 2021).

196 Berryhill, Jamie., Heang, Kévin Kok., Clogher, Rob., and McBride, Keegan., OECD., (2019). *Hello, World: Artificial Intelligence and its use in the public sector* Page 72. OECD, Observatory of Public Sector Innovation (OPSI), Paris, France, Prepared by the Directorate for Public Governance under the leadership of Marcos Bonturi. Retrieved from AI-Report-Online.pdf (oecd-opsi.org) (Accessed 13 May 2021)

their strategic vision and approach to AI, that AI strategies can help countries build a common foundation for success in their AI progress, as well as align the capacities, norms and structures of the relevant AI actors and ecosystems, noting that in 2020 at least 50 countries (including the European Union) had developed, or were in the process of developing, a national AI strategy at that time.

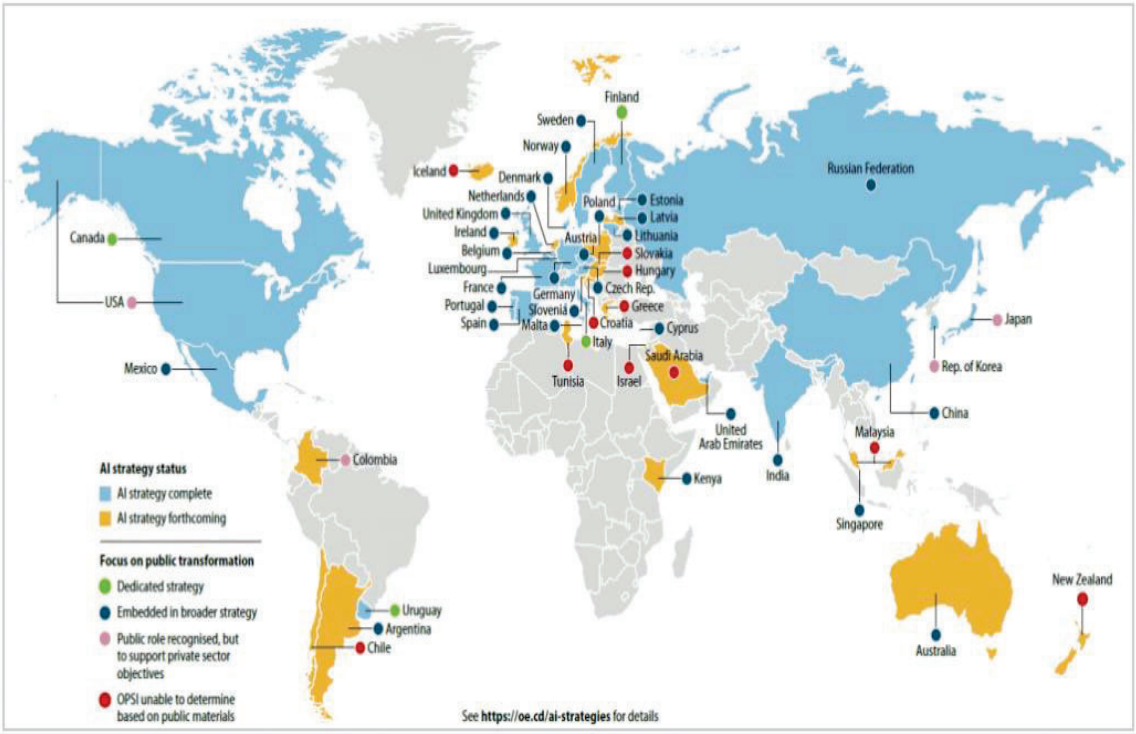


**Figure 2.20: AI strategies and the extent to which they include public transformation as reported by the OECD, OPSI (2021, map last updated 22 November 2019)**

They referenced many examples including the 2017 Singapore national AI programme, a government-wide partnership, which brings together research institutions, and the private sector and that the partnership had three objectives, (1) using AI to address major challenges that affect society and industry, (2) invest in deep capabilities to catch the next wave of scientific innovation, (3) broaden adoption and use of AI and machine

learning within industry; also, that the Singapore national AI programme made commitment to developing a set of guidelines on the use of AI to manage risk.197

### 2.5.2 Emerging Risks AI enabled Financial Fraud, Cybercrime

The AI world brings challenges too and increased risk of AI-enabled Financial fraud, for example, Stupp, C., (2019) reported that scams using artificial intelligence are a new challenge highlighting a case of AI enabled cyber-crime.

> "Fraudsters Used AI to Mimic CEO's Voice in Unusual Cybercrime Case
>
> Criminals used artificial intelligence-based software to impersonate a chief executive's voice and demand a fraudulent transfer of €220,000 ($243,000) in March in what cybercrime experts described as an unusual case of artificial intelligence being used in hacking.
>
> The CEO of a U.K.-based energy firm thought he was speaking on the phone with his boss, the chief executive of the firm's German parent company, who asked him to send the funds to a Hungarian supplier. The caller said the request was urgent, directing the executive to pay within an hour, according to the company's insurance firm, Euler Hermes Group SA. Euler Hermes declined to name the victim companies."

Stupp, C., (2019) reported that it was not clear if the attackers used bots to react to the victim's questions on the call and that it was possible that hackers used commercial voice-generating software to carry out the attack or that audio samples could be stitched together to mimic a person's voice, using publicly available voice recordings increasingly

197 OECD., (2019). *AI Strategies and Public Sector Components map*. OECD, Observatory of Public Sector Innovation (OPSI), Paris, France, Website last updated: 23 January 2020 for the text; 22 November 2019 for the map) https://oecd-opsi.org/projects/ai/strategies/ (Accessed 13 May 2021)

available. It was noted in the article that although there was a police investigation, Europol was not involved.198

Europol is the European Union Law Enforcement Agency199 they produce an annual *Internet Organised Crime Threat Assessment* (IOCTA) it 'provides a unique law enforcement focused assessment of emerging challenges and key developments, in the area of cybercrime.' They noted 'combining law enforcement and private sector insights allows us to present this comprehensive overview of the threat landscape.200 The 2020 annual threat assessment report highlighted emerging AI cybercrime risks set out below.

> **"Looking ahead: Malicious use of Artificial Intelligence**
> Artificial intelligence (AI) is at the heart of the so-called 4th industrial revolution and promises greater efficiency, higher levels of automation and autonomy. AI is intrinsically a dual use technology: while it can bring enormous benefits to society, AI can also enable a range of digital, physical and political threats. Therefore, the risks and potential criminal abuse of AI systems need to be well understood in order to protect against malicious actors. For instance, criminals could make use of AI to facilitate and improve their attacks by maximising opportunities for profit in a shorter time, exploiting new victims, and creating more innovative criminal business models, while reducing the chances of being caught. As 'AI-as-a-Service' becomes more widespread, it lowers the entry barrier to criminal activities by reducing the skills and technical expertise needed to employ it. This further exacerbates the potential for AI to be abused by criminals and become a driver of crime.
>
> Concrete scenarios include AI malware, AI-supported social engineering, AI based password guessing, AI-aided reconnaissance or AI-facilitated content creation, to mention a few.

198 Stupp, Catherine., (2019) *Fraudsters used AI to mimic CEO's voice in unusual cybercrime case* Published by Wall Street Journal retrieved from Fraudsters Used AI to Mimic CEO's Voice in Unusual Cybercrime Case - WSJ

199 European Union, Europol (2021) Website – about Europol About Europol | Europol (europa.eu)

200 European Union, Europol (2020) webpage INTERNET ORGANISED CRIME THREAT ASSESSMENT (IOCTA) 2020 | Europol (europa.eu)

> It is therefore necessary, in close cooperation with industry and academia, to develop a body of knowledge on the potential use of AI by criminals with a view to better anticipating possible malicious and criminal activities facilitated by AI, as well as to prevent, respond to, or mitigate the effects of such attacks in a pro-active manner. Understanding of capabilities, scenarios, and attack vectors is the key to enhancing preparedness and increasing resilience." 201

Europol (2021) noted that public institutions, including critical infrastructures such as health services, continue to be targeted by cybercriminals, and that potential leaks of data or disruption to services could result in very high financial and social costs also that risks of greater use of Internet of Things (IoT), and AI applications will create opportunities for cyber criminals, as AI systems performance and applications relies on data sets. They highlighted that if cyber criminals gain access to these data, they gain access to personal information. They state if AI is used in decision-making systems, data manipulation may have serious consequences for individuals, and they observed that criminal use of AI including exploiting deepfakes is expected to increase in the future. 202

The EU lists all Impact Assessment undertaken, one of their impact assessments undertaken by the Board in 2020 was the 'Initiative on strengthening Europol's mandate.'

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201 European Union, Europol (2020) page 18 *INTERNET ORGANISED CRIME THREAT ASSESSMENT (IOCTA) 2020 | Europol (europa.eu) Published by Europol, the Hague, The Netherlands.*

202 Europol (2021), European Union serious and organised crime threat assessment, A corrupting influence: the infiltration and undermining of Europe's economy and society by organised crime, Publications Office of the European Union, Luxembourg Page 40 https://www.europol.europa.eu/activities-services/main-reports/european-union-serious-and-organised-crime-threat-assessment *Published by Europol, the Hague, The Netherlands.*

203 Ireland's 2020 National Risk Assessment noted that 'newer threats such as those arising in the cyber environment or from a changing geo-political landscape will present new challenges'204 but does not specifically reference Artificial Intelligence. The National Risk Assessment provides a basis for establishing priorities for the mitigation of the key risks identified at national level and the website advised the risk assessment will inform Government decisions regarding resource allocation.205 Europol IOCTA annual threat assessments are not referenced in this report. Ireland's first 'Money laundering and terrorist financing (ML/TF) national risk assessment (NRA), National Risk Assessment was produced in 2020 (Department of Finance 2020) the aim of this process was to identify, understand and assess the money laundering and terrorist financing risks faced by Ireland noting in relation to cyber-crime that:

> Law enforcement intelligence suggests that the proceeds of cybercrime are typically electronic payments which are transferred through the financial system, money remittance firms and, more recently, using cryptocurrencies such as Bitcoin. The use of cryptocurrencies is common in Distributed Denial of Service (DDoS) attacks and malware/ransomware attacks. Criminals use money mule accounts to launder the proceeds of cybercrime committed in Ireland and abroad. Cybercrime is an emerging and fast-developing category of criminal activity affecting Ireland.

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203 European Union, European Commission, (2021) *Annual Report 2020 of the Regulatory Scrutiny Board* Page 41

204 Ireland, Government of Ireland (2021) *National Risk Assessment* Page 13 https://www.gov.ie/en/press-release/5e685-national-risk-assessment-for-ireland-2020/

205 Ireland, Government of Ireland (2021) *National Risk Assessment* Page 13 https://www.gov.ie/en/press-release/5e685-national-risk-assessment-for-ireland-2020/

The report also stated it is also known that cybercrime is perpetrated against individuals, businesses, and government entities.206

Ireland's updated national risk assessment of new technologies DPER (2019) was completed in accordance with Recommendation 15 of the Financial Action Task Force (FATF)207

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206 Department of Finance Department of Justice and Equality in collaboration with the National Anti-Money Laundering Steering Committee (2020) *National Risk Assessment 2019 Money Laundering and Terrorist Financing* Pages 35-36

207 Financial Action Task Force (2021) website https://www.fatf-gafi.org/

> The Financial Action Task Force (FATF) is the global money laundering and terrorist financing watchdog. The inter-governmental body sets international standards that aim to prevent these illegal activities and the harm they cause to society. As a policy-making body, the FATF works to generate the necessary political will to bring about national legislative and regulatory reforms in these areas.
>
> With more than 200 countries and jurisdictions committed to implementing them. The FATF has developed the FATF **Recommendations**, or FATF Standards, which ensure a co-ordinated global response to prevent organised crime, corruption and terrorism. They help authorities go after the money of criminals dealing in illegal drugs, human trafficking and other crimes. The FATF also works to stop funding for weapons of mass destruction.
>
> The FATF reviews money laundering and terrorist financing techniques and continuously strengthens its standards to address new risks, such as the regulation of virtual assets, which have spread as cryptocurrencies gain popularity. The FATF monitors countries to ensure they implement the FATF Standards fully and effectively, and holds countries to account that do not comply.
>
> The 2012 report was updated in 2020 is available at FATF Recommendations 2012.pdf (fatf-gafi.org)
>
> Recommendation 15 New Technologies states
>
> Countries and financial institutions should identify and assess the money laundering or terrorist financing risks that may arise in relation to (a) the development of new products and new business practices, including new delivery mechanisms, and (b) the use of new or developing technologies for both new and pre-existing products. In the case of financial institutions, such a risk assessment should take place prior to the launch of the new products, business practices or the use of new or developing technologies. They should take appropriate measures to manage and mitigate those risks. To manage and mitigate the risks emerging from virtual assets, countries should ensure that virtual asset service providers are regulated for AML/CFT purposes, and licensed or registered and subject to effective systems for monitoring and ensuring compliance with the relevant

and assesses risks in relation to virtual currencies, assets, electronic money, and crowdfunding mentioning, blockchain, Anti-Money Laundering (AML), Countering of Financing of Terrorism (CFT) and noted residual risk ratings may change when next reviewed either due to changes in regulation or further development in the technologies themselves208. In quantifying AI and new technologies risk in relation to financials, data, ethics, and AI-enabled cyber-crime. FATF recommendations should be considered as part of annual assessment of risk, by all entities, as risk management is part of the corporate governance framework. Maturity models can assist with this.

### 2.5.3 Maturity models, algorithm assessments and case studies assessments

The Monetary Authority of Singapore AI Maturity Framework comprises guidance on measures promoting responsible use of AI that organisations should adopt under the 4 headings below, noting as part of considerations for *internal governance structures and measures* below, that ethical considerations can be introduced as corporate values, managed through ethics review boards or similar structures, and that 'as AI technologies evolve, so would the related ethical and governance issues' and that their Framework could continue to be updated in this regard.

> "This Model Framework comprises guidance on measures promoting the responsible use of AI that organisations should adopt in the following key areas:

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measures called for in the FATF Recommendations. **I need permission to include this -requested, outstanding.**

208 Department of Finance (2021) *New Technologies Risk Assessment Update of Ireland's National Risk Assessment* Pages 5, 26

(A) Internal Governance Structures and Measures. Adapting existing or setting up internal governance structure and measures to incorporate values, risks, and responsibilities relating to algorithmic decision-making.

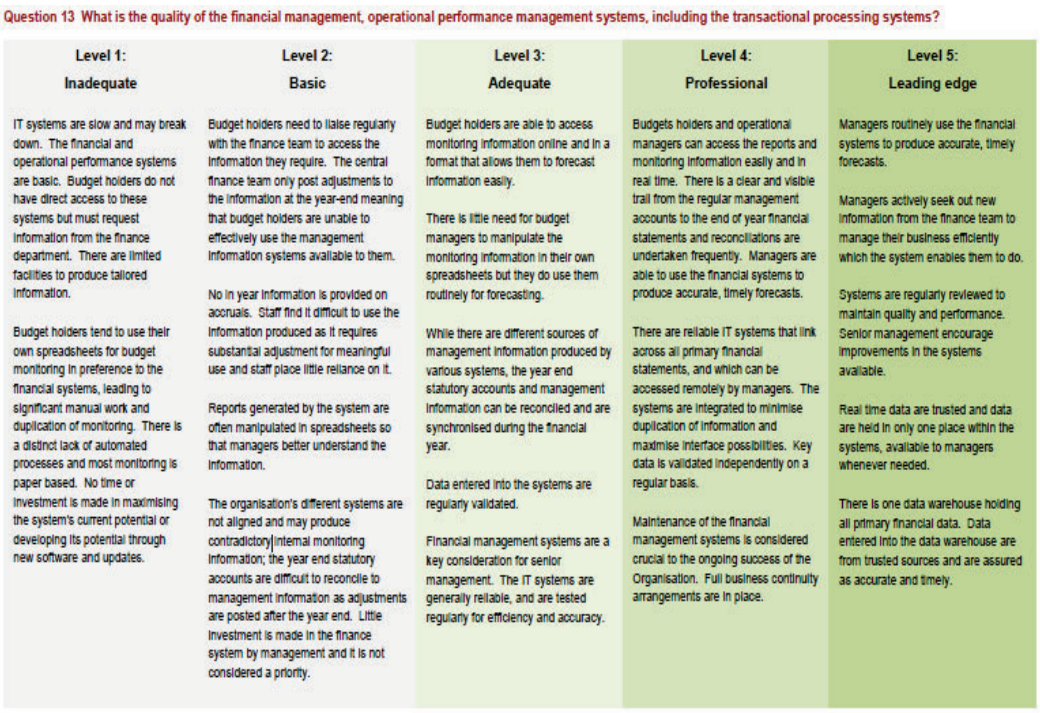
(B) Determining the level of human involvement in AI-augmented decision-making. A methodology to aid organisations in setting its risk appetite for use of AI, i.e. determining acceptable risks and identifying an appropriate level of human involvement in AI-augmented decision-making.

(C) Operations management Issues to be considered when developing, selecting and maintaining AI models, including data management.

(D) Stakeholder interaction and communication Strategies for communicating with an organisation's stakeholders, and the management of relationships with them".209

The Irish Government Comptroller and Auditor General (2018) Financial Maturity Model, Maturity Model can be used to evaluate the impact of technology as part of the overall financial maturity assessment.

209 Singapore Government, Department for Communications and Information., (2019). *Model Artificial Intelligence Governance Framework* Second Edition Pages 20, 63. Singapore. Retrieved from https://www.pdpc.gov.sg/-/media/files/pdpc/pdf-files/resource-for-organisation/ai/sgmodelaigovframework2.pdf (Accessed 13 May 2021)



Question 13 What is the quality of the financial management, operational performance management systems, including the transactional processing systems?

| Level 1: Inadequate | Level 2: Basic | Level 3: Adequate | Level 4: Professional | Level 5: Leading edge |
|---|---|---|---|---|
| IT systems are slow and may break down. The financial and operational performance systems are basic. Budget holders do not have direct access to these systems but must request information from the finance department. There are limited facilities to produce tailored information.<br><br>Budget holders tend to use their own spreadsheets for budget monitoring in preference to the financial systems, leading to significant manual work and duplication of monitoring. There is a distinct lack of automated processes and most monitoring is paper based. No time or investment is made in maximising the system's current potential or developing its potential through new software and updates. | Budget holders need to liaise regularly with the finance team to access the information they require. The central finance team only post adjustments to the information at the year-end meaning that budget holders are unable to effectively use the management information systems available to them.<br><br>No in year information is provided on accruals. Staff find it difficult to use the information produced as it requires substantial adjustment for meaningful use and staff place little reliance on it.<br><br>Reports generated by the system are often manipulated in spreadsheets so that managers better understand the information.<br><br>The organisation's different systems are not aligned and may produce contradictory internal monitoring information; the year end statutory accounts are difficult to reconcile to management information as adjustments are posted after the year end. Little investment is made in the finance system by management and it is not considered a priority. | Budget holders are able to access monitoring information online and in a format that allows them to forecast information easily.<br><br>There is little need for budget managers to manipulate the monitoring information in their own spreadsheets but they do use them routinely for forecasting.<br><br>While there are different sources of management information produced by various systems, the year end statutory accounts and management information can be reconciled and are synchronised during the financial year.<br><br>Data entered into the systems are regularly validated.<br><br>Financial management systems are a key consideration for senior management. The IT systems are generally reliable, and are tested regularly for efficiency and accuracy. | Budgets holders and operational managers can access the reports and monitoring information easily and in real time. There is a clear and visible trail from the regular management accounts to the end of year financial statements and reconciliations are undertaken frequently. Managers are able to use the financial systems to produce accurate, timely forecasts.<br><br>There are reliable IT systems that link across all primary financial statements, and which can be accessed remotely by managers. The systems are integrated to minimise duplication of information and maximise interface possibilities. Key data is validated independently on a regular basis.<br><br>Maintenance of the financial management systems is considered crucial to the ongoing success of the Organisation. Full business continuity arrangements are in place. | Managers routinely use the financial systems to produce accurate, timely forecasts.<br><br>Managers actively seek out new information from the finance team to manage their business efficiently which the system enables them to do.<br><br>Systems are regularly reviewed to maintain quality and performance. Senior management encourage improvements in the systems available.<br><br>Real time data are trusted and data are held in only one place within the systems, available to managers whenever needed.<br><br>There is one data warehouse holding all primary financial data. Data entered into the data warehouse are from trusted sources and are assured as accurate and timely. |

**Figure 2.21: IT systems, quality of financial management, operational performance management systems and transactional processing systems maturity levels by the Irish Office of the Comptroller and Auditor General (2018)**

This financial maturity model is built around five key themes, noting, strong financial governance, a good ethical culture, and effective leadership, are at the heart of good financial management. For each theme, the model sets out questions that address financial management practices and awareness in an organisation. The OC&AG state that the model is a framework under which financial management activities in Irish public sector organisations can be examined. The model has five levels of maturity, Level 1 the lowest level of maturity and Level 5 being the highest. The OC&AG state that Level 1 and 2 are not appropriate for public sector organisations, that of the other levels, specific circumstances of the organisation dictate which level is appropriate. As part of assessment of Financial monitoring and forecasting Question 13 considered the quality of the financial

management, operational performance management systems, including transactional processing, and references IT technologies.210

The Ada Lovelace Institute UK (2019) identified four prominent approaches to assessing algorithms two approaches to algorithm audit, and two approaches to algorithm impact assessment. Based on their literature review and conversations with experts including social scientists, computer scientists, policymakers, and the general public, they noted that their report although aimed at policymakers, is helpful to anyone who creates or interacts with algorithmic systems, and wants to know what methods or approaches exist to evaluate the systems.211

Berryhill, J. et al, OECD, (2019) reference the need for standards in AI procurement, citing the Government of Canada's AI source list which is in place to help government offices streamline procurement and select vendors with expertise in AI noting

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210 Ireland, Office of the Comptroller and Auditor General, (OC&AG)., (2018). *Financial Management Maturity Model a Good Practice Guide.* Pages 9, 15, 46. OG&AG, Dublin, Ireland. Retrieved from: Report: https://www.audit.gov.ie/en/find-report/publications/2018/special-report-101-financial-management-maturity-model-a-good-practice-guide.pdf, Website press release on Financial Maturity Model: https://www.audit.gov.ie/en/about-us/media/press%20releases/press%20release%20-%20financial%20management%20maturity%20model%20-%20a%20good%20practice%20guide.html Financial Maturity Model Retrieved from: https://www.audit.gov.ie/en/about-us/media/press%20releases/financial-management-maturity-model.pdf Overview of the financial management maturity model. Retrieved from https://www.audit.gov.ie/en/about-us/media/press%20releases/overview-of-the-financial-management-maturity-model.pdf (All accessed 13 May 2021)

211 Ada Lovelace Institute, UK., DataKind UK., (DKUK) (2019). *Examining the Black Box.* Pages 3-6. Ada Lovelace Institute, London, UK., DKUK.,. Retrieved from: https://www.adalovelaceinstitute.org/wp-content/uploads/2020/04/Ada-Lovelace-Institute-DataKind-UK-Examining-the-Black-Box-Report-2020.pdf (Accessed 13 May 2021)

that this Framework requires suppliers to demonstrate competence in AI ethics.212 The AI Source List213 is available online.

Canada's Algorithmic Impact Assessment (AIA) is a checklist provided by government for the wider citizenship, also globally, which asks questions related to their business, data and system designed decisions. This AIA helps mitigate the impact of automated decision-making under the Directive on Automated Decision-Making.214 This tool is available for all to make use of. The archived version is also available. 215

Allessie, D., Sobolewski, M., and Vaccari, L., (2019) case study assessment framework is a useful model to examine any case study of good practice. They use it to

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212 Berryhill, Jamie., Heang, Kévin Kok., Clogher, Rob., and McBride, Keegan., OECD., (2019). *Hello, World: Artificial Intelligence and its use in the public sector* Page 130. OECD, Observatory of Public Sector Innovation (OPSI), Paris, France, Prepared by the Directorate for Public Governance under the leadership of Marcos Bonturi. Retrieved from AI-Report-Online.pdf (oecd-opsi.org) (Accessed 13 May 2021)

213 Canada Government., Systems Software Procurement Division., (2018). *INVITATION TO QUALIFY (ITQ) on a source list of suppliers to provide Canada with responsible and effective Artificial Intelligence (AI) services, solutions and products.* Pages 1-25. Quebec, Canada. Retrieved from: https://buyandsell.gc.ca/cds/public/2018/09/21/5e886991ecc74498b76e3c59a6777cb6/ABES.PROD.PW__EE.B017.E33817.EBSU001.PDF (Accessed 13 May 2021)

214 Canada Government (2021) *Algorithmic Impact Assessment Tool.* Canada, Retrieved from https://www.canada.ca/en/government/system/digital-government/digital-government-innovations/responsible-use-ai/algorithmic-impact-assessment.html (Accessed 13 May 2021: Website last modified: 2021-04-01)

215 Canada Government (2021) *Algorithmic Impact Assessment Version 0.9.* Canada Government. Retrieved from: Algorithmic Impact Assessment - Évaluation de l'incidence algorithmique (canada-ca.github.io) (Accessed 13 May 2021: Website last modified: 2021-03-22) and *Algorithmic Impact Assessment Tool Archived.* Canada Government. Retrieved from: https://canada-ca.github.io/digital-playbook-guide-numerique/views-vues/automated-decision-automatise/en/algorithmic-impact-assessment.html (Accessed 13 May 2021)

evaluate examples of blockchain use including land title registry property transactions. Georgia and Sweden use it in Digital identity for proof of residency. The Municipality of Zug in Switzerland use it for e-voting, Luxembourg for Blockchain governance. The Netherlands uses it for pension system management.216

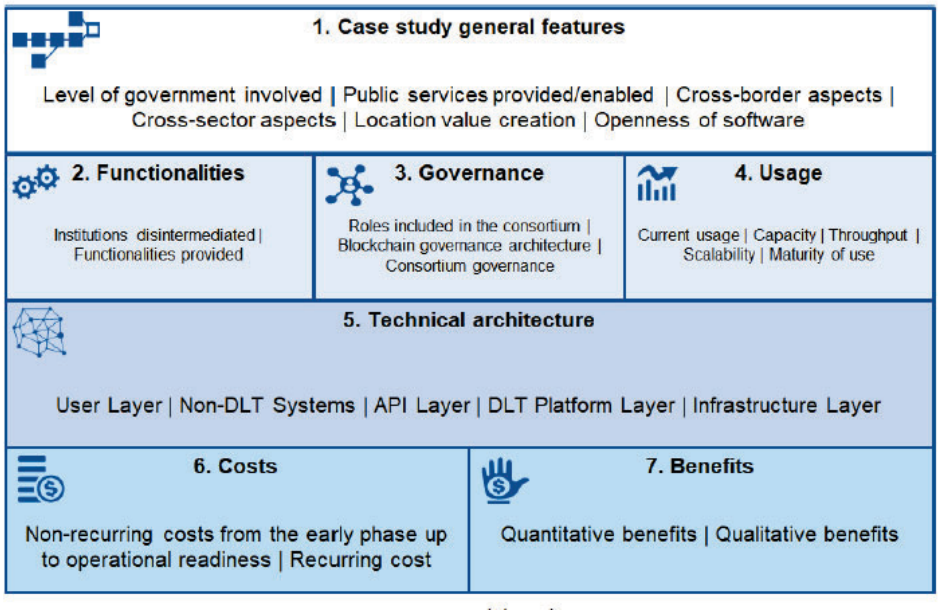


**Figure 2.22: Blockchain Use Case Study Assessment Framework by the European Commission, Joint Research Centre, Allessie, D. Sobolewski, M., and Vaccari, L., (2019)**

The European Blockchain partnership cites examples of upcoming EU cross-border application of blockchain technology, including the European Court of Auditors registry of audit-related files initially proposed in 2018, to provide beneficiaries with ability to

216 Allessie, D., Sobolewski, M., Vaccari, L, (2019) *Blockchain for digital government*, Pages 13-15, 16-46 European Commission Joint Research Centre, Science for Policy Report. Pignatelli, F. editor(s), EUR 29677 EN, Publications Office of the European Union, Luxembourg, 2019, ISBN 978-92-76-00581-0 (online),978-92-76-00582-7 (print),978-92-76-05477-1 (ePub), doi:10.2760/942739 (online),10.2760/93808 (print),10.2760/161081 (ePub), JRC115049. Retrieved from: JRC Publications Repository - Blockchain for digital government (europa.eu) (Accessed 13 May 2021)

systematically register audit-relevant documents (invoices, proof of payments, supporting documents, bids) creating a trusted, fully digital audit trail. The underlying documents stored off chain, the record on blockchain and metadata, would be accessed in real time.217 *Iaconisi, M., (2020) in discussions about the future of accounting and audit, cites the European Court of Auditors (ECA) web-based notarisation service*218 *which, can notarise,*

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217 European Union, European Commission, European Blockchain Services Infrastructure (EBSI)., (2018). Overview of use-cases; cross-border digital public services that could be supported by the European Blockchain Services Infrastructure (EBSI) Pages 1, 11. In hardcopy dated 17 December 2018.

"By design, EBSI is being built in an iterative manner, focusing on a small number of specific use cases (applications), and then expanding them over time. The initial set of EBSI use cases are:

- **Notarisation**: Leveraging the power of blockchain to create trusted digital audit trails, automate compliance checks in time-sensitive processes and prove data integrity.
- **Diplomas**: Giving control back to citizens when managing their education credentials; significantly reducing verification costs and improving authenticity trust.
- **European Self-Sovereign Identity**: Implementing a generic Self-Sovereign Identity capability, allowing users to create and control their own identity across borders without relying on centralised authorities, and enabling for compliance with the eIDAS (electronic Identification, Authentication and Trust Services) regulatory framework.
- **Trusted Data Sharing**: Leveraging blockchain technology to securely share data amongst authorities in the EU, starting at first with the IOSS (Import One Stop Shop) VAT (value added tax) identification numbers and import one-stop-shop amongst customs and tax authorities.

Retrieved from: https://digital-strategy.ec.europa.eu/en/policies/ebsi (Accessed 14 May 2021: Website last updated 13 April 2021) See also introductory presentation. Retrieved from: EBSI Documentation home (europa.eu) (Accessed 14 May 2021)

218 European Union, European Court of Auditors (ECA) (2020) *Notaris Registry.* EU, ECA, Luxembourg. Retrieved from: notaris.registry (europa.eu) (Accessed 14 May 2021) As noted on the website, ECA. Guardians of the EU's Finances

audit documentation; protect ECA publications; and notarise of public procurement procedures as an example of same. He observes that the application has built in GDPR compliance, as the process allowed users to give trusted third parties such as audit institutions explicit consent to access their notarised documents and notarisation data whenever needed.219

The European Commission (2021) noted, since 2018, 29 countries (All EU Member States, Norway and Lichtenstein) and the European Commission joined forces to form the European Blockchain Partnership working together towards realising the potential of blockchain-based services for the benefit of citizens, society, and economy.

The European Blockchain Services Infrastructure (EBSI) Platform is a peer-to-peer network of interconnected nodes. EBSI's architecture is composed of three layers, an infrastructure layer which provides generic capabilities and connectivity to Blockchain networks; a chain and storage layer which encompasses both, the blockchain and the off-chain storage protocols currently supported by EBSI and, core services the set of standardised interfaces, application programming interfaces, (APIs) which provide the capabilities for third-parties to develop applications and ensure compliance with guiding principles defined and approved by the European Blockchain Partnership.

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219 *Iaconisi, Mirko., European Court of Auditors,* External Action, Security and Justice Directorate., *(2020). The European Blockchain Services Infrastructure is coming and the ECA has a role to play. Paragraphs, 5, 6, 7, 8, 9 and Figure 1. European Union, ECA, Luxembourg. Retrieved from:* https://medium.com/ecajournal/the-european-blockchain-services-infrastructure-is-coming-and-the-eca-has-a-role-to-play-68b53395c788 Published Feb 28 2020, *first published 01 2020.* (Accessed 14 May 2021)

The European Blockchain Services Infrastructure EBSI, is the first EU-wide blockchain infrastructure, driven by the public sector.  in full respect of European values and regulations. 220

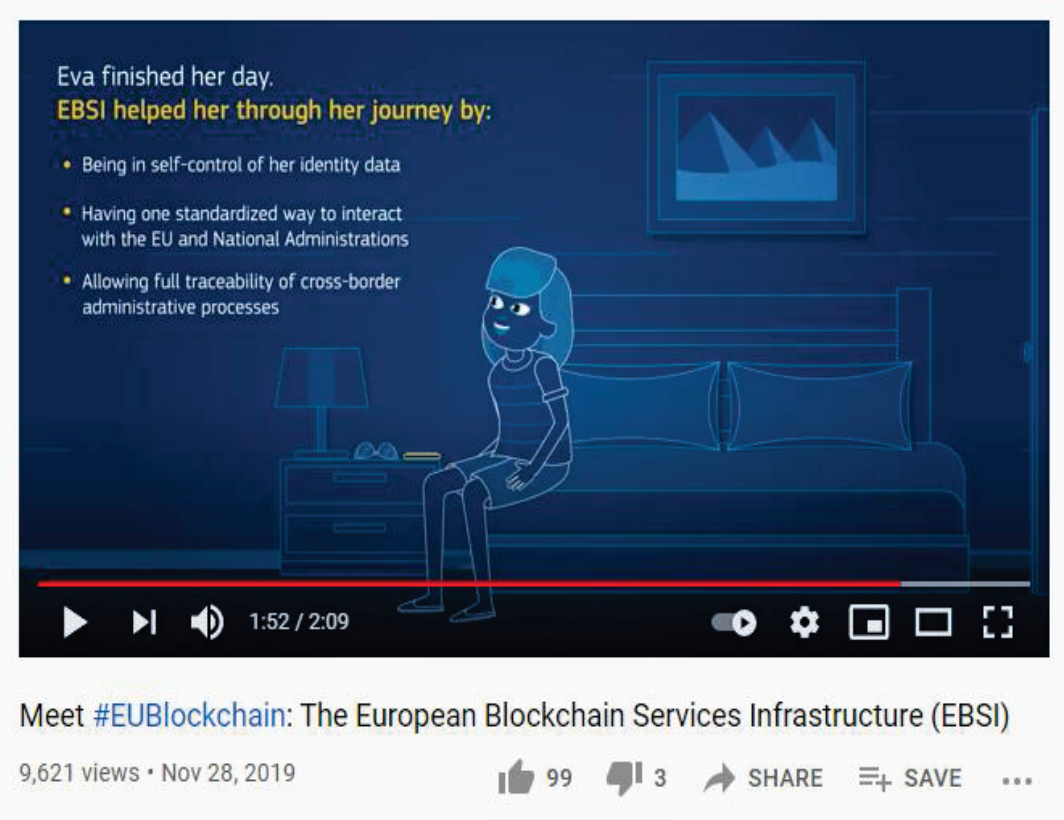


**Figure 2.23: European Commission, Meet #EUBlockchain: The European Blockchain Services Infrastructure (EBSI) by the European Commission EBSI, (2019) YouTube https://www.youtube.com/watch?v=m2uj7fgb2JI**

220 European Union, European Commission., (2021). Brussels, Belgium. Retrieved from https://ec.europa.eu/cefdigital/wiki/display/CEFDIGITAL/EBSI (Accessed 14 May 2021) As noted on the EU EBSI website.

The ECA embrace blockchain use in practical applications for expenditure management as noted in their 2018 conference.221

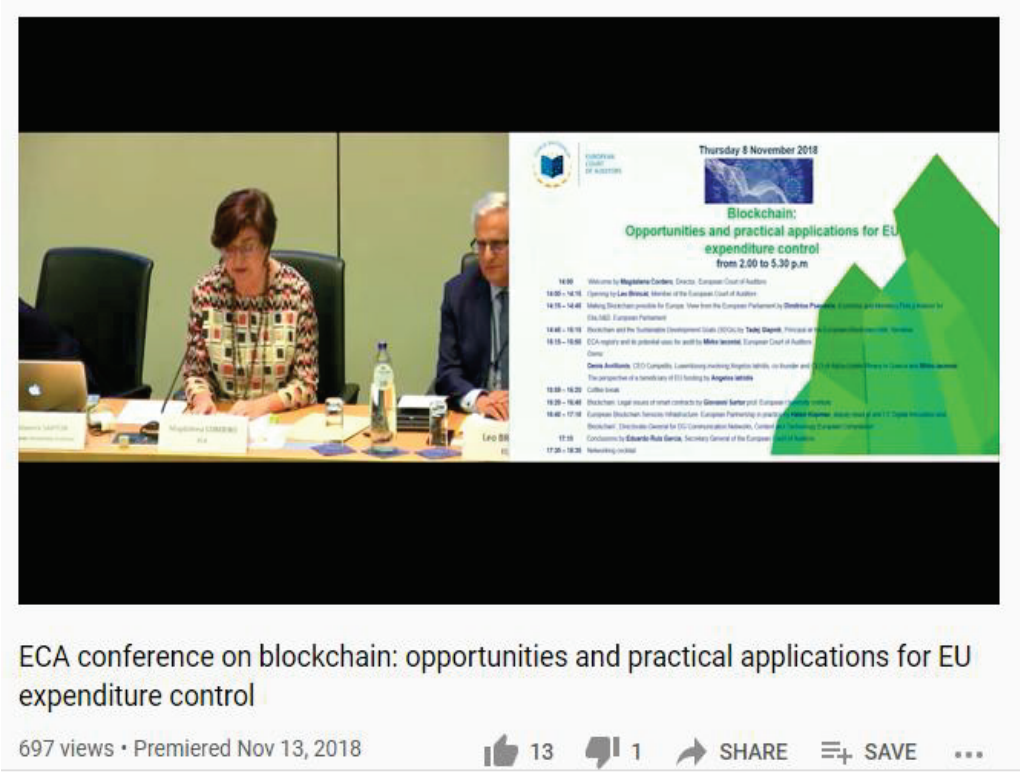


**Figure 2.24: European Court of Auditors conference on blockchain, opportunities and practical applications for EU expenditure control by the ECA, (2018)**

221 *European Union, European Court of Auditors.,* (Premiered 13 November 2018). *Conference on blockchain: opportunities and practical applications for EU expenditure controls.* European Union, European Court of Auditors, Luxembourg. YouTube: Retrieved from https://www.youtube.com/watch?v=v5Ej4LfqQBg *(Accessed 14 May 2021)*

The European Commission Inter-service group on Public Administration Quality and Innovation (2017 last updated 2021) state that optimising public administration processes might "actually save a lot of money". 222

Auer, B. (2018) noted that the ECA registry in its current state is a working prototype but, if widely used by EU institutions and beneficiaries of EU funds, it would become a powerful tool to support the audit process. Having all digital documents notarised through the registry would allow the ECA to perform fully digital audits. 223

Mitre Corporation (2019) reported on their work with public sector on a blockchain project to improve grant management, (since developed) their report shows current and future desired state both set out in the figures below.224

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222 European Union, European Commission Inter-service group on Public Administration Quality and Innovation., (2017 last updated 2021). *Quality of Public Administration Toolbox.* Page 220. EU, European Commission, Brussels, Belgium. Retrieved from: Quality of Public Administration "Toolbox". (Accessed 14 May 2021).

223 European Union, European Court of Auditors, Auer, Barbara., (2018). *International Cooperation in Audit, Reaching Out.* Pages 140-141. EU, European Court of Auditors, Luxembourg. Journal 11-18-12. Retrieved from: *Blockchain in public administration - opportunities and practical applications at the ECA* (Accessed 14 May 2021).

224 *Mitre Corporation., (2019).* Assessing the Potential to Improve Grants Management Using Blockchain Technology, Pages 8-9. USA. Retrieved from: MITRE Grants Management Blockchain Study Report (Accessed 14 May 2021).

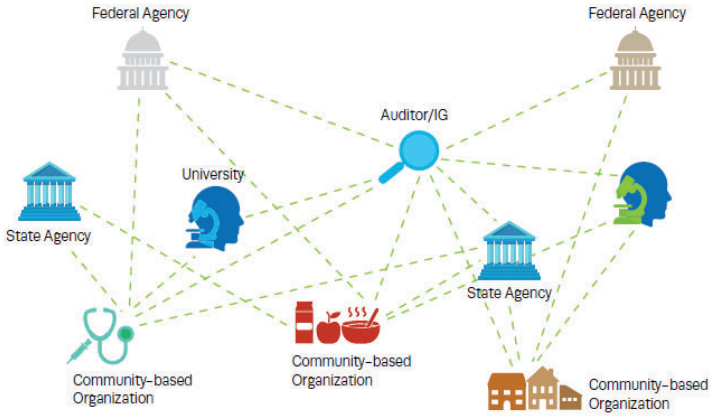


**Figure 2.25: Current State for Grant Applications by the Mitre Corporation Ltd (2019)**

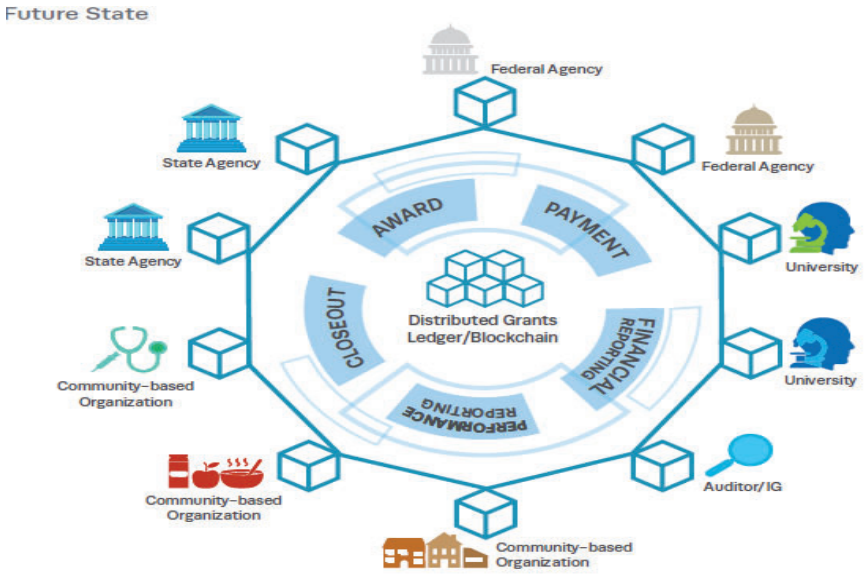


**Figure 2.26: Future State for Grant Applications by the Mitre Corporation Ltd (2019)**

Asia Blockchain Review, (2020) reported an article written by Rockwell, M.,225 (2020) noting that the US treasury department and the National Science Foundation have developed a blockchain enabled system that allows the payments and terms of grants to be better monitored, that this is done while using a blockchain-powered letter of credit to facilitate peer to peer transfers.226

Robotics too, play a key role in financial management. The USA Federal RPA Community of Practice (2020) maturity assessment of 23 government entities found 49% of RPA use cases were in the Finance Business Function.227

225 Rockwell, Mark., (2020). *Tracking Grants by Blockchain.* Paragraphs 1-5. GCN media. McLean. Virginia, USA. Retrieved from: Treasury Department finishing tests of a blockchain-based letter of credit capability for grant tracking -- GCN *(Accessed 14 May 2021)*

226 *Asia Blockchain Review., (2020).* Improving Grant Management with Blockchain Technology. *Paragraph 1. Asia Blockchain Review, Kuala Lumpur, Malaysia. Published 27 January 2020. Retrieved from:* Improving Grant Management with Blockchain Technology - Asia Blockchain Review - Gateway to Blockchain in Asia *(Accessed 14 May 2021) Source of article originally* Rockwell, Mark., (2020). Tracking Grants by Blockchain. Paragraphs 1-5. GCN media. McLean. Virginia, USA. Retrieved from: Treasury Department finishing tests of a blockchain-based letter of credit capability for grant tracking -- GCN *(Accessed 14 May 2021)*

227 Federal RPA Community of Practice (COP)., (2020). *The State of Federal RPA An Analysis of Governmentwide RPA Impact, Deployment and Best Practices* Version 1.0 USA Pages 5, 8. November 01, 2020. USA: Eds: Geoghegan, James., Keene, Nathan., and Stegmaier, Andrew., Digital.gov online article. USA. Retrieved from https://digital.gov/pdf/state-of-federal-rpa.pdf (Accessed 14 May 2021)

| | LEVEL 1 | LEVEL 2 | LEVEL 3 | LEVEL 4 | LEVEL 5 |
|---|---|---|---|---|---|
| **Maturity Component** | **(0-29 Points)** | **(30-49 Points)** | **(50-69 Points)** | **(70-89 Points)** | **(90-100 Points)** |
| Automations in Production | 1-5 Applications (5) | 5-20 Applications (10) | 20-50 Applications (15) | 50-100 Applications (20) | 100+ Applications and Monthly Production of 5+(25) |
| Annualized Hours of Workload Reduction | 0-5,000 Program Cumulative (0) | 5-50,000 Program Cumulative (5) | 50-150k Program Cumulative (10) | 150k-300k Program Cumulative (15) | 300k+ Program Cumulative (20) |
| Process Improvement | No Capability (0) | Basic PI Capability (3) | Intermediate PI Capability (4) | Advanced PI Capability (5) | |
| Program Impact | Processed Automated for Work Teams (1) | Processed Automated for Office-Level Units (2) | Processed Automated for Bureau/Divisions (3) | agencywide Processes Automated (4) | governmentwide Processes Automated (5) |
| Opportunity Identification | Ad Hoc Approach (1) | 5+ Application Pipeline (3) | 10+ Application Pipeline (5) | 20+ Application Pipeline and Active Opportunity Generation (7) | 30+ Application Pipeline & Multi-Customer Demand (10) |
| Production Environment | Pilot Desktop Automation (1) | VDI Attended Automations (5) | On-Prem Enterprise Platform (10) | Enterprise Cloud Platform (20) | |
| Security and Technology | Pilot Security Approvals and Publicly Available Data (0) | RPA Software ATO / Approval, Using PII on Ad hoc Basis, and Human User Credentials (3) | RPA Software & Enterprise Platform ATO / Approval, Standard Approach to Using PII, and 50%+ Unattended Automations (5) | RPA Software & Enterprise Platform ATO / Approval, Standard Approach to Using PII, and 50%+ Unattended Automations (7) | RPA Software & Enterprise Platform ATO / Approval, Standard Approach to Using PII, and 75%+ Unattended Automations (10) |
| IA Capabilities | | | Basic IA Capability (1) | Intermediate IA Capability(3) | Advanced IA Capability (5) |

**Key Definitions:**
**Basic PI Capability** includes the introduction of standardized automation design documentation; **Intermediate PI Capability** includes process assessment, mapping, and improvement tools; **Advanced PI Capability** includes reengineering and metric definition.
**Basic IA Capability** includes use of native sensory tools to the RPA workflow; **Intermediate IA Capability** introduces advanced sensory tools to automation workflow; **Advanced IA Capability** includes NLP, ML, image analysis, cognitive agents, or chat bots.

**Figure 2.27: RPA Maturity Model by the USA Federal RPA community of practice (2020)**

Madakam. S., Holmukhe. R., Jaiswal. D. K., (2019) highlighted that RPA software can be used to assist in handling unstructured data in support of fraud / Anti Money Laundering (AML).228

Misuraca. G., and van Noordt, C., (2020) identified 230 cases of AI used in the public services in the EU. There were different typologies. But case studies of financial statements production or corporate reporting were not identified. Fraud detection was

228 Somayya, Madakam., Rajesh M. Holmukhe., and Durgesh, Kumar., Jaiswal., (2019). *The future digital work force: Robotic Process Automation (RPA)* India Journal of Information Systems and Technology Management – Jistem USP Vol. 16, 2019. Journal of Information Systems and Technology Management, e201916001 ISSN online: 1807-1775 DOI: 10.4301/S1807-1775201916001

mentioned, and they noted, for example, that in France, an AI system to detect fraud in value declarations and to identify import trafficking developed by the French customs agency. They identified use of AI systems against financial trafficking also used in that unit fighting against money laundering and the financing of terrorism, and they referenced that some municipalities in the Netherlands used SyRi to detect welfare fraud more effectively.

They stated only 5% of cases (12 of 230) were noted where AI was used for granting of social benefits to people in need. They queried in this instance, whether many government agencies themselves worry about delegating this discretion to AI systems in full, and would prefer to see further maturing of this kind of technological solution before deciding to undertake this commitment. 229

### 2.5.4 Human involvement in AI-augmented decision-making

Baker-Brunnbauer (2020) interviewed management experts in Austria and Germany but noted that the people interviewed were not motivated to openly talk about ethics and so his research expended to cover the Scandanavian countries. He suggested that the reason behind the different level of openness to talk about ethics might be related to cultural differences but states that these influences were outside the scope of the research. His research found most internal AI development stakeholders had a technical background,

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229 Misurca, Gianluca., and van Noordt, Colin., (2020) *AI Watch – Artificial Intelligence in Public Services: Overview of the use and impact of AI in Public Services in the EU.* Pages 25, 45, 61, 68. European Union, Publications Office, Luxembourg, ISBN 978-92-76-19540-5 (online), doi:10.2760/039619 (online), JRC120399 EUR 30255 EN. Science for Policy Report of the Joint Research Centre (JRC). European Union, European Commission. Available at: https://publications.jrc.ec.europa.eu/repository/bitstream/JRC120399/jrc120399_misuraca-ai-watch_public-services_30062020_def.pdf (Accessed 14 May 2021)

that the strong technical focus was not generating a diversity of different professions, and at the time of the research, current job offerings were mainly focusing on employees with technical AI skills, and he concludes that diversity was one factor to reduce bias.230

Berryhill, J. et al, OECD, (2019) emphasize the importance of Diversity and Inclusiveness that it is important to bring together multi-disciplinary and diverse teams to determine the best AI solutions and to promote the development of AI initiatives and projects that are both effective and ethical.231

Public Service strategies on diversity and inclusiveness in the Public Service acknowledge the importance of diversity, and may include surveys of their staff views for example the UK Civil Service Workforce Plan 2016 to 2020 set out its' ambition to become the most inclusive UK employer by 2020 recognising diversity and inclusion is a business imperative for the Civil Service, staff across the country were listened to about their personal experience of working in the Civil Service, and other matters, including the further actions required for the Civil Service Diversity & Inclusion strategy to make a real difference, noting that diversity is the mix inclusion is about making the mix work. Digital co-workers were not mentioned at this time.232

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230 Baker-Brunnbauer, Josef., (2020). *Management perspective of ethics in artificial intelligence.* Pages, 1, 4, 5, 6, 8. SpringerLink, Switzerland. Retrieved from: Management perspective of ethics in artificial intelligence | SpringerLink *AI Ethics* (2020). https://doi.org/10.1007/s43681-020-00022-3 (Accessed 14 May 2021)

231 Berryhill, Jamie., Heang, Kévin Kok., Clogher, Rob., and McBride, Keegan., OECD., (2019). *Hello, World: Artificial Intelligence and its use in the public sector* Page 89. OECD, OPSI, Paris, France. Retrieved from: AI-Report-Online.pdf (oecd-opsi.org) (Accessed 14 May 2021).

232 UK Civil Service (2017) *A brilliant Civil Service; Becoming the most inclusive employer* Pages, 10-11. UK, Civil Service, OGL, Retrieved from: 6.3737_CO_PH_Civil

**Figure 2.28: The AI powered Organisation The main challenge isn't technology. It's culture. Photo on the cover of Harvard Business Review July-August 2019, by Flashspop / Gerry Images, Seattle, Washington, USA (2019)**

Digital co-workers are not mentioned at this time. Do Workforce plans need to include digital co-workers and public servant views on the new co-working relationships?

The International Telecommunication Union (ITU), the United Nations specialized agency for information and communication technologies (2019) states AI has the potential

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Service Diversity and Inclusion Strategy (publishing.service.gov.uk) (Accessed 15 May 2021).

to support and enhance ICT accessibility, 'AI for Good', if provided with the right data and algorithms (rules and calculations) while ensuring Universal Design for all. They highlight that assistive Technologies are increasingly integrated within operating systems and services, for example, speech recognition, that when Assistive Technology is built into systems it supports those of do not necessarily consider themselves to be disabled but require additional support for work. The benefits of AI, and deep learning can be used to augment a user's skills, for example, automated visualisation of complex data can provide an alternative format for those who find analysing numbers or dense text hard to comprehend.233

The Centre for Legal Leadership UK (2021) noted digital workplace and Diversity and Inclusiveness (D&I) are important but there is sometimes a disconnect between the two noting that in-house legal teams are well placed to provide a sensible level-headed view and point out where D&I is not being applied. They highlight areas for consideration including, use of imagery, remote working, and acknowledging cultural differences to

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233 UN, ITU., (2019). *Accessible Europe 2019 backgrounder Artificial Intelligence and Information Communication Technology Accessibility* Pages 2-3. UN, ITU, Geneva. Switzerland. Retrieved from: https://www.itu.int/en/ITU-D/Regional-Presence/Europe/Documents/Events/2019/Accessible%20Europe/0920_AI%20and%20ICT%20Accessibility_webEA3_Final.pdf (Accessed 15 May 2021).

"Accessible Europe: ICTs 4 ALL" is held within the framework of the Regional Initiative for Europe on Accessibility, affordability and skills development for all to ensure digital inclusion and sustainable development adopted by the World Telecommunication Development Conference 2017. This regional initiative aims at bridging the digital divide and equipping all groups of society, including persons with disabilities and other groups of people with specific needs, to take advantage of ICT, by enabling capacity building in digital skills.

digital. They noted that although leading with a legal and risk hat on, might make people listen, that, ultimately arguments which also show the commercial advantages of D&I, and which reflect a positive ethical stance, are likely to be the ones that resonate the deepest and result in action.234

Verbruggen, M., (2019) highlighted strategic, legal and ethical challenges to ensuring human control over EU military robot swarms, noting that strategically there is no guarantee that the robot swarms will execute missions exactly according to an operator's wishes, legally an attack using robot swarms may pose a risk to civilians as well as cause pollution, and ethically controlling a robotic swarm may erode an operator's sense of moral responsibility and potentially unfairly lay accountability for the outcome on operators, highlighting the risks of conflict escalation, violations of international humanitarian law and ethical principles, referencing the need for EU funded swarm research programmes to take steps to address these issues.235

The UN Institute for Disarmament Research (UNIDIR) (2021) provides an overview of robotic swarms, in the context of military and autonomous weapon systems and the UN seeking as a shared objective, to engage on the appropriate level of human

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234 Centre for Legal Leadership (2021) *Ensuring diversity and inclusion is reflected in the digital workplace*. Paragraph 1-conclusion. UK, Retrieved from: https://www.legalleadership.co.uk/knowledge/the-bigger-picture/diversity-and-inclusion/ensuring-diversity-and-inclusion-is-reflected-in-the-digital-workplace/ (Accessed 14 May 2021)

235 Verbruggen, Maaike., (2019). *THE QUESTION OF SWARMS CONTROL: CHALLENGES TO ENSURING HUMAN CONTROL OVER MILITARY SWARMS* Pages, 1, 13, 14. EU, EU Non-Proliferation and Disarmament Consortium. Retrieved from The Question of Swarms Control: Challenges to Ensuring Human Control over Military Swarms (nonproliferation.eu) (Accessed 14 May 2021).

control over emerging technologies, in lethal autonomous weapons systems, for laws and human control. They identify characteristics of robot swarms including, Mass; Diversity (simple and complex robots, cross domain air, sea, land, manned and unmanned systems, human and robot); Collective and collaborative behaviour (communication explicit and implicit for information exchange); Autonomy and Decentralisation (humans control the swarm as a whole swarm and not individual robots, the robot swarm decides that using parameters, proximity, payload). The UNIDIR note that 'research and development in the context of autonomous weapons systems is advancing at a high pace', that 'human control, involvement and oversight are crucial to ensuring accountability under international humanitarian law', and that 'machine to machine interaction and emergent behaviors in swarms will change the ways in which humans exercise such control and oversight.'236

Misuraca. G., and van Noordt, C., (2020) 230 case studies of AI use in public sector in the EU noted that their approach for selecting case studies and priority services to focus on, was selecting 'AI-enabled services that were either effective or generating social or ethical concerns whilst also impacting, sometimes disruptively and perhaps even radically - the way government operates.'. They reference military once, noting the German Government AI strategy, which states the use of AI in the public sector will also mean that new requirements and rules should be put in place also that both the opportunities and the threats of the new technology should be explored, that the strategy noted the appropriate

236 Ekelhof, M., and Paoli, Giacomo. Persi., UN Institute for Disarmament Research (UNIDIR) YouTube video *What are Robotic Swarms?* UN, Geneva, Switzerland, What are Robotic Swarms? An Overview - YouTube Retrieved from: (Accessed 23 May 2021)

emergency response and protection mechanisms would be developed to counter AI-based attacks (especially in the military context).

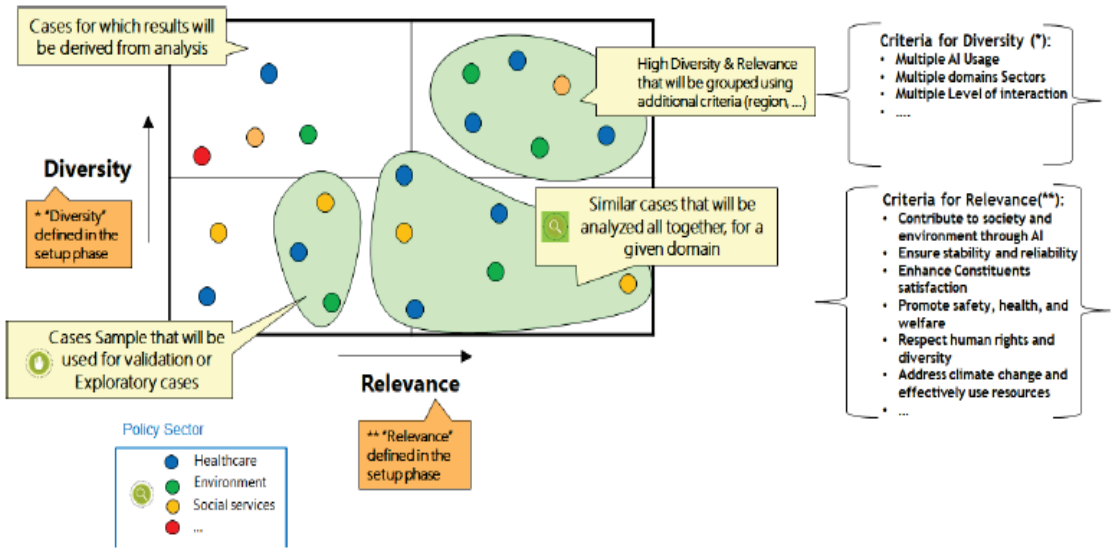


**Figure 2.29: Approaches for prioritisation and selection of case studies by Misurca, G., and van Noordt, G., (2020)**

They noted the current debate tends to place government either in the role of 'regulatory actor' or at best 'facilitator', setting out the framework conditions for private actors, and citizens, to deploy and use AI in an ethical manner, that, current policy discourse focuses on the governance 'of' AI, far less on the governance 'with' AI. 237

237 Misurca, Gianluca., and van Noordt, Colin., (2020). *AI Watch – Artificial Intelligence in Public Services: Overview of the use and impact of AI in Public Services in the EU.* Pages 39, 41, 59. European Union, European Commission, Publications Office, Luxembourg, ISBN 978-92-76-19540-5 (online), doi:10.2760/039619 (online), JRC120399 EUR 30255 EN. Science for Policy Report of the Joint Research Centre (JRC). European Union, European Commission. Available at: https://publications.jrc.ec.europa.eu/repository/bitstream/JRC120399/jrc120399_misuraca-ai-watch_public-services_30062020_def.pdf (Accessed 14 May 2021)

### 2.5.5 Public Sector Ethics Governance Frameworks for Financial Data and AI-augmented decision-making

From the Literature review, awareness of the AI use in public sector, it's potential, and the importance of AI ethics is increasing. The global list of AI guidelines online which was last updated in April 2020, reviewed by Algorithm Watch, did not include financial frameworks of the IFAC and IMF. (Haas, Gießler, (2020) (2021)). More work needs to be done on this area. Current policy discourse focuses on the governance 'of' AI, far less on the governance 'with' AI.

Question 4

*Do public sector corporate governance frameworks need to change to incorporate AI ethical considerations, governance of AI governance by AI?*

## 2.6 Do public sector corporate governance frameworks need to change to incorporate AI ethical considerations, governance of AI, governance by AI?

### 2.6.1 Governance by/with AI

As noted, Misurca, G., and van Noordt, G., (2020) observed that the current policy discourse focuses on the governance 'of' AI, far less on the governance 'with' AI and as well as referencing the use of Predictive Analytics and improved inspection capabilities, improved social welfare and reduced misuse of public funds they cite different case studies on 'governance by AI'. In the municipality of Trelleborg Sweden cognitive robotics, and process automation in a social welfare system in 2016, was positively received initially as staff found it made their work more effective and brought more legal certainty. Some staff were hesitant to use the system 'due to fears of losing jobs or passing sensitive social tasks on to computers. Even though 75% of the citizens use the online platform, concerns remain in terms of the risks of excluding more vulnerable citizens when all processes are automated online. In the Netherlands, various municipalities were using the SyRi system to detect welfare fraud more effectively, but the Dutch court decided in early 2020 that the use of SyRi did not comply with Article 8 of the ECHR (European Convention of Human Rights), and usage has been cancelled. The absence of disclosure about the inner working of SyRi makes its usage insufficiently transparent and verifiable. The judge had ruled that the collective, economic welfare interest of preventing fraud weighed insufficiently against the social interest of privacy.

In Poland, the report referenced unemployment profiling using expert and rule-based systems, and algorithmic decision-making based on data collected during an initial interview, age, gender, disability and duration of unemployment, an AI system which received criticism because the working of the AI system was opaque to citizens and was

intended to serve as an advisory tool, retaining a 'human in the loop', who would have the final say. They report that less than 1 in 100 decisions made by the algorithm were questioned by responsible clerks, giving a variety of work culture reasons as to why this did not happen and the system was dismantled by Government in 2019, when the Supreme Audit Office concluded that the system was not effective and had the potential to lead to discrimination.238

| # | Initiative | AI Typology | Country | Administrative level | Purpose(*) | Policy sector (COFOG) | Key enablers | Expected impact |
|---|---|---|---|---|---|---|---|---|
| 1 | SATIKAS | Computer Vision and Identity Recognition | Estonia | Central | Enforcement | Economic Affairs | Satellite data, resource/data sharing, funding, trust | Improved administration and resource use, improved subsidy compliance |
| 2 | Predictive system | Predictive Analytics, Simulation and Data Visualisation | Belgium | Central | Enforcement | Health | Sharing of data/resources, high data quality, convincing staff of value | Improved inspection capabilities, improved welfare of children |
| 3 | Automated public services | Cognitive Robotics, Process Automation and Connected and Automated Vehicles | Sweden | Local | Adjudication | Social Protection | Developed online services, political leadership | Reduced waiting time, increased efficiency, improved citizens' experience |
| 4 | Chatbot UNA | Chatbots, Intelligent Digital Assistants, Virtual Agents and Recommendation Systems | Latvia | Central | Public services and engagement | Economic Affairs | Data on FAQ, external consultancy providing expertise | Reduced administrative burden and workload, improved public service, improved citizens' experience |
| 5 | Tengai | Predictive Analytics, Simulation and Data Visualisation | Sweden | Local | Internal Management | General Public Services | Consultancy assistance, Existing recruitment practices, culture for innovation | Unbiased recruitment services, higher quality personnel, lower recruitment costs and length |
| 6 | SyRi (Systeem Risico Indicatie) | Predictive Analytics, Simulation and Data Visualisation | Netherlands | Central/Local | Enforcement | Social Welfare | Sharing of data/resources, high data quality, political leadership | Improved inspection capabilities, improved social welfare, reduced misuse of public funds |
| 7 | Unemployed profiling | Expert and Rule-based Systems, Algorithmic Decision Making | Poland | Central / Municipal | Adjudication | Economic Affairs | Political leadership, Available data on unemployment, drive for modernization | Personalized public services, reduced unemployment, improved efficiency |
| 8 | VeriPol | Natural Language Processing, Text Mining and Speech Analytics | Spain | Central | Enforcement | Public Order and Safety | Collaboration with university, corpus of digital reports, integration into existing information system | Higher detection of false reports, higher productivity, reduced submission of fraudulent reports |

**Table 2.2: List of selected cases of AI use in Public Services, for illustrative analysis, by Misurca, G., and van Noordt, G., (2020)**

238 Misurca, Gianluca., and van Noordt, Colin., (2020). *AI Watch – Artificial Intelligence in Public Services: Overview of the use and impact of AI in Public Services in the EU* Pages 11, 41, 43-44, 45-47 European Union, Publications Office, Luxembourg, ISBN 978-92-76-19540-5 (online), doi:10.2760/039619 (online), JRC120399 EUR 30255 EN. Science for Policy Report of the Joint Research Centre (JRC). European Union, European Commission. Available at: https://publications.jrc.ec.europa.eu/repository/bitstream/JRC120399/jrc120399_misuraca-ai-watch_public-services_30062020_def.pdf (Accessed 14 May 2021)

Shaji, A. K. (2019) noted that in India public and private sector banks are using AI to reduce banking sector fraud, also non-performing assets (NPAs) which can happen for many reasons, including, lending practices, business risk, environmental risk (flood, cyclone, etc.) also noting that NPAs of Public Banks in India were increasing rapidly and NPAs of private sector banks were decreasing. They recommend use of RPA technologies to make loan disbursements more transparent, reaching people with higher credibility, also to link loan data to the customers overall assets and liabilities so the customers' ability to repay would be clearer, to analyse the customer intention for the end use of the funds and the customer psyche, to analyse customer monthly usage of funds monitoring anomalous behaviour indicating difficulty paying rather than waiting 90 days and note that this will create a risk free atmosphere for banks and bankers, noting also that there is lots of political pressure on the bankers while disbursing loans from banks.239

The European banking Federation (EBF) 2019 position paper on AI in the banking industry states AI provides great opportunities to enhance customer experience, democratize financial services, improve cybersecurity and consumer protection, and strengthen risk management, enhancing the efficiency of banking processes including process automation, reporting, document classification, automated data extraction, document processing, and credit scoring, enhancing security and risk control including any kind of anomaly detection, AML (Anti-Money Laundering) detection and monitoring,

239 Shaji, Aneesha. K., (2019). *A study on the management of non-performing assets in the Banking Sector using Artificial Intelligence* Pages 118 -125. Shaji, Aneesha. K., of the Department of Commerce, Kristu Jayanti University, Bangalore, India. On Researchgate.net, Berlin, Germany, Bangalore, India. Think India Journal, Volume 22 Issue 44 December 2019. ISSN 09 711260. Retrieved from (Accessed 14 May 2021).

system capacity limit prediction, support of data quality assurance, fraud prevention and payment transaction monitoring. They cite AI use for credit-scoring noting:

> Today, with the objective of measuring the credit worthiness of their clients, banks rely on gathering transactional data, statistical analysis, decision trees, and regression to better estimate a consumer's credit risk and assess whether they will be able to repay a loan.
> The use of AI technology enables more accurate scoring and allows for improved access to credit by reducing the risks and the number of false-positives and false-negatives. This will help banks to determine the most suitable debt plan for their customers. It also ensures banks properly manage credit risk, which is essential for financial stability.

They consider ethics and stress the importance to remain neutral towards the technology and look at its application and the objectives behind it and of ensuring a level playing field for all industries and geographies, to ensure the uptake of AI in the European banking sector. The EBF calls for a full-fledged AI fitness check of the current regulatory framework to adapt rules where relevant and remove obstacles to the deployment by European companies of truly digital strategies.240

Government lending is not mentioned, for example in Ireland, mortgages are provided to citizens who meet certain income threshold criteria and have proof of being rejected by banks through the RIHL. Mortgages are also issued to citizen on a shared-ownership scheme.241 Consideration would need to be given as to the ethical implications of potentially introducing AI into credit scoring for lending purposes in these schemes.

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240 European Banking Federation, (EBF)., (2019). *Position paper on AI in the banking industry* Pages 1, 14, 21. EBF, Brussels, Belgium. Retrieved from EBF_037419 - Artificial Intelligence in the banking sector - FINAL - for approval - CLEAN.docx (Accessed 14 May 2021). EBF.EU website is at HOME - EBF.

241 Ireland, DPER, (2021). *Overall Social Housing Provision.* Retrieved Ireland, Dublin. from. gov.ie - Overall social housing provision (www.gov.ie) (Accessed 14 May 2021: Published on 3 December 2020 Last updated on 9 March 2021) and *Affordable*

Schmid, D. (2019) states that 'a broad spectrum of fields of application of AI' in the financial sector include, 'asset management, portfolio management,' and 'treasury' all of which are equally relevant to government policy and argues that "the use of AI can inject fairness into the process of granting customer loans. Thanks to AI, the number of loan commitments increased in the applicant groups that had previously received significantly fewer commitments in the course of an analogous award procedure and that "the indispensable prerequisite for such success is to free the algorithms of statistical prejudices."242

The Cambridge Centre for Alternative Finance (CCAF) at the University of Cambridge Judge Business School and the World Economic Forum and (2020) global survey of AI in Financial Services noted that Regardless of sectors and entity types, quality of and access to data and access to talent are considered to be major obstacles to implementing AI, and that Almost 40% of all respondents felt that regulation hinders their implementation of AI although it was noted that firms' assessments of the impact of regulation tended to be more positive in China than in the US, the UK, or mainland Europe.

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*Housing and Part V.* Retrieved, Ireland, Dublin, from gov.ie - Affordable housing and Part V statistics (www.gov.ie) (Accessed 14 May 2021: Published on 3 December 2020 Last updated on 15 March 2021)

242 Schmid, Daniel. (2019). *AI In the Financial Sector: The Ethics of Algorithms (Part 1)* Walldorf, Germany, SAP SE, Digital List Magazine, 03 April 2019, and *AI In the Financial Sector: The Ethics of Algorithms (Part 2)* Retrieved from: Part 1. https://www.digitalistmag.com/finance/2019/04/03/ai-in-financial-sector-ethics-of-algorithms-part-1-06197582/ Part 2. AI In The Financial Sector: The Ethics Of Algorithms (Part 2) (digitalistmag.com) Original source of articles is stated by Digital List Magazine, as in Börsen-Zeitung and was republished by permission. [Note: I searched using "KI im Finanzsektor: Die Ethik der Algorithmen" and could not locate in the German newspaper].

They noted that autonomous decision-making remains the least usage field of AI among respondents and, while the regulation of AI is an ongoing consideration for regulators, autonomous decision-making poses specific challenges which policymakers are just beginning to address, that it is more likely that substantially autonomous AI is only tolerable to decision-makers and policymakers in environments of high generalised trust, underpinned by predictable and stable regulation, also that that incumbents and FinTechs still overwhelmingly utilise AI as a tool which merely complements human decision-making (see below):

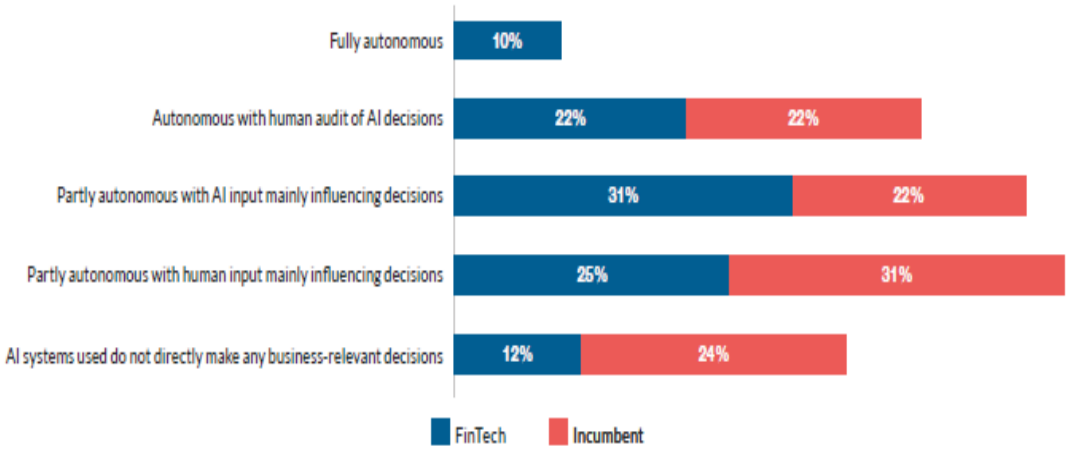


**Figure 2.30: Autonomy of AI systems currently in use by entity type, Transforming Paradigms Global AI in Financial Services Survey by Cambridge Centre for Alternative Finance (CCAF) at the University of Cambridge Judge Business School and the World Economic Forum and (2020)**

They noted that regulators are wary of 'black box' AI systems that are hard for them and for firms to oversee, and concern that AI will exacerbate or even vindicate pre-existing social biases and that training AI systems on data containing these historical social

influences can lead to models in which personal characteristics, or close proxies thereof, influence outcomes disproportionately.243

The Public Expenditure Financial Accountability (PEFA) is a partnership program of the European Commission, the International Monetary Fund (IMF), the World Bank, and the governments of France, Luxembourg, Norway, the Slovak Republic, Switzerland, and UK set up to establish a uniform approach to collecting information on countries' public financial management (PFM) performance. The PEFA framework identifies 94 characteristics (known as dimensions) within 31 key components of PFM (known as indicators) in seven broad areas of PFM (known as pillars). The Framework is based on the budgetary cycle stages. In their 2020 annual report PEFA key findings noted were:

> "Governments perform strongest on budget preparation and weakest on the effectiveness of internal audit and external audit and scrutiny.
>
> At the subnational level, governments had the strongest performance in accounting and reporting.
>
> Only two-thirds of documents that governments submit to the legislature for review are also publicly available to citizens." (pages 25, 26)

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243 Cambridge Centre for Alternative Finance, (CCAF), and World Economic Forum., (2020). *Transforming Paradigms, A Global AI in Financial Services Survey.* Pages 12, 76, 83, 106, 107. Cambridge, UK, CCAF, University of Cambridge Judge Business School and World Economic Forum, Geneva, Switzerland. Retrieved from: WEF_AI_in_Financial_Services_Survey.pdf (weforum.org) (Accessed 14 May 2021)

Lead Researchers: Lukas Ryll (CCAF), Mary Emma Barton (World Economic Forum), Bryan Zheng Zhang (CCAF) and Jesse McWaters (World Economic Forum and Independent). Researchers and co-authoris. Emmanuel Schizas (CCAF), Rui Hao (CCAF), Keith Bear (CCAF), Massimo Preziuso (Cork University Business School), Elizabeth Seger (University of Cambridge), Robert Wardrop (CCAF), Raghavendra Rau (CCAF), Pradeep Debata (University of Cambridge), Philip Rowan (CCAF), Nicola Adams (CCAF), Mia Gray (CCAF) and Nikos Yerolemou (CCAF). Other contributors. Lin (National University of Singapore), Christian Hugo Hoffmann (ETH Zurich) and Matthew Saunders (Independent).

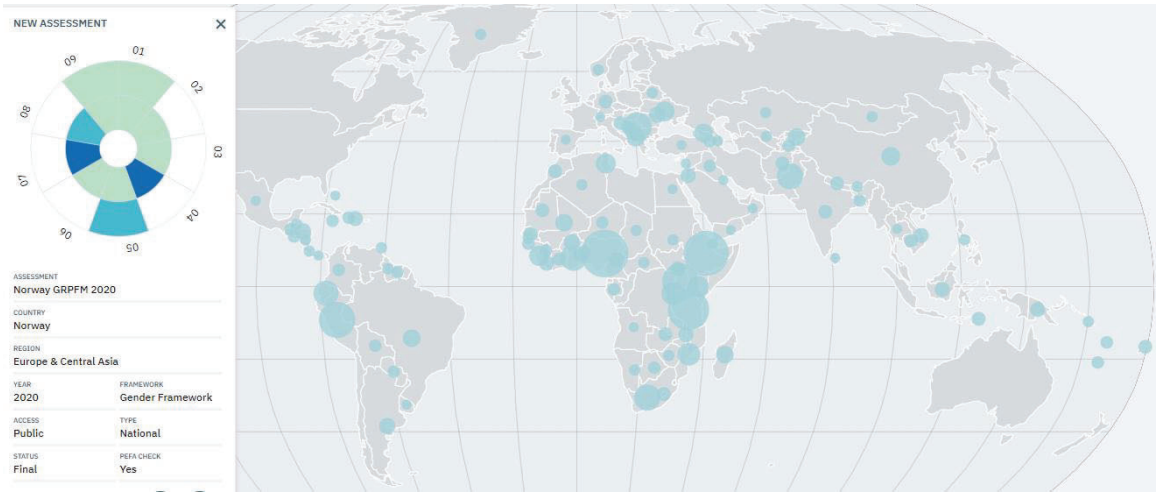


**Figure 2.31: Map of Public Expenditure and Financial Accountability (PEFA) assessments 2005-2020 by PFEA (2020)** Homepage | Public Expenditure and Financial Accountability (PEFA)

PEFA also showcases key findings from the initial application of the recently launched PEFA framework for assessing gender responsive public financial management, noting:

> "There is growing recognition that public budgeting decisions and the public financial management (PFM) systems that underpin them can affect the economic and social outcomes of men and women differently. As a result, gender responsive public financial management, also known as gender responsive budgeting (GRB), has been developed as an approach to budgeting that explicitly considers the impact of fiscal policy, PFM, and public administration on gender equality, girls' and women's development, and specific groups of people (for example, people with disabilities, minorities).
>
> Moreover, the Sustainable Development Goals (SDG) clearly highlight the importance of linking gender equality with financing for development."

PEFA stated changes in policies can have different impacts on the delivery of services to men and women and to subgroups of those categories and highlight the benefit

of undertaking ex-ante gender impact evaluations, analyses, or assessments of policies to understand their envisaged impacts on men and women and subgroups of those categories to improve the design and planning of the policy under consideration to avoid any negative impacts on gender equality, and to strengthen gender equality, through better-designed, transformative policies.244

PEFA (2020) state that climate risks and opportunities should be integrated at every stage of the policy process and across planning, program design, implementation, maintenance, and evaluation and that this requires a systematic whole-of-government approach. In 2019, a coalition of more than 50 finance ministers in PEFA are playing an active role in seeking to drive stronger collective action on climate change and its impacts, by formulating, mobilizing support for, and implementing policies and plans that tackle the trajectory and impact of climate change, because national budget processes, budget planning, public investment management, procurement practices, and intergovernmental fiscal relations have a critical role to play in meeting the challenge of climate change. The questionnaire in shown in their document. PEFA state management of public non-financial assets, including network infrastructure systems should consider the risks to assets related to climate change, that these include transition risks which can arise because changes in technology, regulation, and market conditions as economies decarbonize and they highlight that this may lead to "stranded" assets that can no longer operate economically and they note that in this regard, climate change represents significant risks to public finances and should be taken into account when determining

244 Public Expenditure Financial Accountability (PEFA)., (2020). *Global report on Public Financial Management* Pages, 7, 25, 26, 40, 42, 95-105 (Gender responsiveness of public financial management). PEFA, Netherlands. Retrieved from: https://www.pefa.org/global-report-2020/report/what-is-pefa (Accessed 14 May 2021)

fiscal policies. Climate Advocacy Groups in the context of budget and audit scrutiny are referenced245

Popp, A. (2019) argues AI restores public trust in the fiscal accountability of governments, that AI can improve financial and audit efficiency. He notes government audit departments challenges citing for example that if a government department that must perform 150 audits per year by legislative mandate, with so many audits required, where is the time to dive into different areas of analysis and reveal insights that can help lead to improved service to the public?

He posits that the current government processes and professionals are not catching the errors faster than whistle-blowers are reporting it and therefore it is not surprising that governments are perceived as being ineffective in how they deal with the detection of fraud and errors in their financial statements. Referring to AI, Machine Learning and Algorithmic transparency, in the context of public trust in government, and concludes that:

"There are significant benefits for governments in the early application of AI to detect financial anomalies to turn the tide on fraudsters and bad actors. Beating whistle-blowers to detect and mitigate fraud is an achievable goal through AI and will make major leaps towards restoring the public's faith in a government's ability to manage the public's finances.246

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245 PEFA., (2020). *Responsive Public Financial Management Framework PEFA Climate Piloting Phase.* Page 6. Questionnaire: Preparing the PEFA Climate assessment in [insert country name] - Climate Change Policy Context pages 20-23. Advocacy Groups pages 32, 64, 68.76. Published by PEFA, Netherlands. Retrieved from: PEFA Climate Framework from August 4 2020 Final.pdf (Accessed 14 May 2021)

246 Popp, Andrew. (2019). *How AI restores the public's trust in the fiscal accountability of government.* Blog Post, Andrew Popp, Canada, Mindbridge. Retrieved from Government AI: How financial automation restores public trust | MindBridge (Accessed 14 May 2021)

### 2.6.2 Algorithmic Governance, Financial Data and Audit

Can AI governance remove bias from financial data? Many would argue yes, because of better data, and better profiling. But remembering the human involvement in interpretation of AI enabled decision-making, does judgement impact? Can AI remove 'survivorship bias'? This literature review encountered no reference to consideration of this bias, which is applicable to economics. Bazzi, A., (2020) explores this concept, illustrating same with the story of Abraham Wald, outlining that survivorship bias is the logical error made when we concentrate on the things that make it past selection processes and ignore those that did not, that this can lead to the wrong conclusions when analyzing any data. The question arises, could AI counterfactuals remove this bias?

Bazzi, A., (2020) recounts how during World War 11, Abraham Wald a mathematician was consulted by the American military about how to reinforce the areas on planes that were hardest hit, to reduce losses. Wald advised that the areas on the planes not hit, the cockpit and motors, should be reinforced, because the worst hit planes never made it back. This assessment was backed up by probability, as Wald had calculated the probability of planes to survive a certain number of hits, he had stated his assumptions, that planes were downed by hits from enemy fire only and not by mechanical failure, that the probability that a plane was shot down didn't depend on the number of previous hits, and he determined the probability of surviving a single hit, taking into account the type of bullet used and the area of the hit. 247

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247 Bazzi, Allesandro., (2020). *Survivorship Bias: The Mathematician Who Helped Win WW11, The legend of Abraham Wald*. All paragraphs. Bazzi, Allesandro, Cantors Paradise, Trondheim, Norway. Retrieved from: https://www.cantorsparadise.com/survivorship-bias-and-the-mathematician-who-helped-win-wwii-356b174defa6

Cagle, K., (2019) notes survivor bias is everywhere, that it can be especially pernicious when dealing with models that have a number of different variables, that the AI software that makes approval recommendations for house loans is predicated upon historical credit records and that good credit is often determined as a function of having a solid, regular stream of money. He outlines how if loans historically were not made to minorities (figuratively shot down) due to racial bias or similar factors, then the software that uses that historical data will not have as many instances of minority loans, and therefore, will be biased pre-emptively to deny credit, even if a buyer has excellent credit otherwise and he concludes that:

> "before specialized AI gets too deeply embedded in various decision loops, it is well worth the (human) analysis to determine whether the training data was suitably representative and complete, and given some indication of this, how likely that bias is present. Without that critical piece of human governance, depending upon machine language AI is foolhardy at best and dangerous at worst." 248

Harvard Gazette writer *Pazzanese, C.,* (2020) raises concern about the unregulated use of AI highlighting no U.S. government oversight, that private companies use AI software to make determinations about health and medicine, employment, creditworthiness, and criminal justice without having to answer for how they are ensuring that programs are not encoded, consciously or unconsciously, with structural biases. 249

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248 Cagle, Kurt., (2019) *The Dog That Did Not Bark In the Night: The Danger of Survivor Bias in AI.* All paragraphs. Cagle, K. Forbes, New York, USA. Retrieved from https://www.forbes.com/sites/cognitiveworld/2019/03/22/the-dog-that-did-not-bark-in-the-night-the-danger-of-survivor-bias-in-ai/?sh=2f15f501667d (Accessed 31 May 2021)

249 Harvard Gazette, *Pazzanese, Christina* (2020) *Great Promise but potential for peril, - ethical concerns mount as AI takes bigger decision-making role* Paragraphs 2 and 9.

Harvard Gazette writer *Mills, K.,* (2020) noted that AI has many applications today, and integrated vast troves of information to aid in strategic decision-making and highlights the debate about regulation of AI noting that there is little consensus on how that should be done and who should make the rules and stated that the view is held that requiring every new product using AI to be pre-screened for potential social harms is not only impractical but would create a huge drag on innovation. 250 Harvard Gazette writer *Furman, J.,* (2020) mentioned the EU data privacy and European Commission consideration of a formal regulatory framework for ethical use of AI. 251

Renda, A., et al., (2021) European Commission project to support an Impact Assessment of Regulatory Requirements for AI in Europe comprises a literature review and country comparison on AI policy, analysis of an open public consultation with 18 free text questions and more than 408 position papers, and cost assessments to deliver the EU proposed regulatory requirements for high-risk AI (human oversight, training data, data and record-keeping, information provision, robustness and accuracy), calculating that the total compliance cost of the proposed regulation on AI systems is roughly 17% of the total AI investment cost but noted that their estimates depend on the evolution of the AI market

250 Harvard Gazette, *Mills, Karen.,* (2020) If we're not thoughtful and careful, we're going to end up with redlining again Paragraphs 10 and 16.

251 Harvard Gazette, *Furman, Jason* (2020) *I wouldn't have a central AI group that has a division that does cars, I would have the car people have a division of people who are really good at AI* Paragraphs 2 and 9.

and definition of high-risk applications by the proposed regulation. Templates for 5 tables are provided to support costs calculations and are set out below.252

| Table 18 - Requirement 1: training data | Good practice data governance | Prior assessment of dataset quality | Suitability of data-driven solutions | Ensure quality of training dataset | Use non-personal or anonymised data | Use sufficiently broad dataset | Disclose provenance and features | Specify learning/ Correct biases | Perform proportionate testing | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|
| Administrative activities | | | | | | | | | | |
| Familiarisation with IO | | | | | | | | | | |
| Procuring data | | | | | | | | | | |
| Filling in forms, labelling, classifying | | | | | | | | | | |
| Performing calculations | | | | | | | | | | |
| Checking data and inputs | | | | | | | | | | |
| Correcting errors | | | | | | | | | | |
| Processing data | | | | | | | | | | |
| Transmitting and publishing data | | | | | | | | | | |
| Internal meetings | | | | | | | | | | |
| External meetings | | | | | | | | | | |
| Payment | | | | | | | | | | |
| Photocopying, filing, distribution | | | | | | | | | | |
| Cooperating in audit by public authorities | | | | | | | | | | |
| Corrections following audit | | | | | | | | | | |
| Procuring additional info in case of audit | | | | | | | | | | |
| Training courses | | | | | | | | | | |
| Substantive costs | | | | | | | | | | |
| Procuring goods and services | Additional data procurement to ensure sufficiently broad dataset | | | | | | | | | |
| Procuring services and/or hiring | | | | | | | | | | |
| Supplying own services | | | | | | | | | | |
| Adjustment of internal processes | | | | | | | | | | |
| Supervisory measures | | | | | | | | | | |
| TOTAL minutes | 510 | 545 | 960 | 300 | 83 | 180 | 47,5 | 390 | 1,685 | 5,180.5 |
| Total cost (hourly rate = EUR 32) | | | | | | | | | | €2,762.93 |

**Table 2.3: Compliance cost of the proposed regulation on AI systems Requirement 1: Training Data, by Renda, A., et al. (2021)**

252 Renda, Andrea., Arroyo, Jane., Fanni, Rosanna., Laurer, Moritz., Sipiczki, Agnes., Yeung, Timothy., Maridis, George., Fernandes, Meena., Endrodi, Gabor., Milio, Simona., Devenyi, Vivien., Georgiev, Stefan., and de Pierrefeu, Ghislain., (2021) *Study to support an impact assessment of regulatory requirements for Artificial Intelligence in Europe* Pages 10, 121, 124, 128, 131, 133, 134, 135, 166.

| Table 19 - Requirement 2 documents and record-keeping | Records on the dataset used to train and test the system | Keep datasets | Documents on programming and training, processes and techniques | Keeping documentation on the functioning of the validated AI system | Make records and data available upon request | Protect confidential information | TOTAL |
|---|---|---|---|---|---|---|---|
| Familiarisation with IO | Overlap with Requirement 1 | | | | | | |
| Procuring data | | | | | | | |
| Filling in forms, labelling, classifying | | | | | | | |
| Performing calculations | | | | | | | |
| Checking data and inputs | | | | | | | |
| Correcting errors | | | | | | | |
| Processing data | | | | | | | |
| Transmitting and publishing data | | | | | | | |
| Internal meetings | | | | | | | |
| External meetings | | | | | | | |
| Payment | | | | | | | |
| Photocopying, filing, distribution | | | | | | | |
| Cooperating in audit by public authorities (freq = 0.5) | | | | | | | |
| Corrections following audit | | | | | | | |
| Procuring additional information in case of audit (freq = 0.5) | | | | | | | |
| Training courses | | | | | | | |
| | | | | | | | |
| Procuring goods and services | Legal advice? | | | | | | |
| Procuring services and/or hiring additional staff | 0.05 FTE data officer – EUR 3,200/year | | | | | | |
| Total minutes | 0 | 23 | 215 | 875 | 338 | 780 | 2,231 |
| Total cost (hourly rate = EUR 32) | | | | | | | EUR 1,190 |
| Total cost | | | | | | | EUR 4,390 |

**Table 2.4: Compliance cost of the proposed regulation on AI systems Requirement 2: Documents and Record-Keeping, by Renda, A., et al. (2021)**

| Table 20 - Requirement 3: information provision | Identity/ contact of the provider | Purpose and key assumptions | Model optimisation and parameters | Capabilities and limitations | Context and conditions of use, accuracy and fairness | Potential effects on safety and fundamental rights risks | Instructions of use, including required oversight | Info on system interaction with humans | Info on system impact on persons | Info queries | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Administrative activities | | | | | | | | | | | |
| Familiarisation with IO | | | | | | | | | | | |
| Procuring data | | | | | | | | | | | |
| Filling in forms, labelling, classifying | | | | | | | | | | | |
| Performing calculations | | | | | | | | | | | |
| Checking data and inputs | | | | | | | | | | | |
| Correcting errors | | | | | | | | | | | |
| Processing data | | | | | | | | | | | |
| Transmitting and publishing data | | | | | | | | | | | |
| Internal meetings | | | | | | | | | | | |
| External meetings | | | | | | | | | | | |
| Payment | | | | | | | | | | | |
| Photocopying, filing, distribution | | | | | | | | | | | |
| Cooperating in audit by public authorities | | | | | | | | | | | |
| Corrections following audit | | | | | | | | | | | |
| Procuring additional information in case of audit | | | | | | | | | | | |
| Training courses | | | | | | | | | | | |
| Substantive costs | | | | | | | | | | | |
| Procuring goods and services | Legal advice on safety and fundamental rights | | | | | | | | | | |
| Procuring services and/or hiring additional staff | | | | | | | | | | | |
| Adjustment of internal processes | Changes in system design to enable explainability and transparency | | | | | | | | | | |
| TOTAL minutes | 7 | 20 | 95 | 78 | 635 | 1,505 | 1,500 | 615 | 545 | 1,800 | 6,800 |
| Total admin cost (hourly rate = EUR 32) | | | | | | | | | | | EUR 3,627 |

**Table 2.5: Compliance cost of the proposed regulation on AI systems Requirement 3: Information Provision, by Renda, A., et al. (2021)**

| Table 21 - Requirement 4: Human oversight | Hiring dedicated staff | Software upgrades | Staff training | TOTAL |
|---|---|---|---|---|
| Administrative activities | | | | |
| Familiarisation with IO | | | | |
| Procuring data | | | | |
| Filling in forms, labelling, classifying | | | | |
| Performing calculations | | | | |
| Checking data and inputs | | | | |
| Correcting errors | | | | |
| Processing data | | | | |
| Transmitting and publishing data | | | | |
| Internal meetings | | | | |
| External meetings | | | | |
| Payment | | | | |
| Photocopying, filing, distribution | | | | |
| Cooperating with audit by public authorities | | | | |
| Corrections following audit | | | | |
| Procuring additional information in case of audit | | | | |
| Training courses | | | | |
| | | | | |
| Procuring goods and services | Purchase of additional software EUR 500 | | | |
| Procuring services and/or hiring additional staff | 0.1 FTE data scientist – EUR 6,400/year | | | |
| Supplying own services | | | | |
| Adjustment of internal processes | | | | |
| Supervisory measures | | | | |
| Storage, inventory management, production | | | | |
| TOTAL minutes | 600 | 540 | 480 | 1,620 |
| Total admin cost (hourly rate = EUR 32) | | | | EUR 864.00 |
| Total cost | | | | EUR 7,764.00 |

**Table 2.6 Compliance cost of the proposed regulation on AI systems Requirement 4: Human Oversight, by Renda, A., et al. (2021)**

| Table 22 - Requirement 5: Robustness and Accuracy | Accuracy | Robustness | Security | TOTAL |
|---|---|---|---|---|
| | | | | |
| Familiarisation with IO | | | | |
| Procuring data | | | | |
| Filling in forms, labelling, classifying | | | | |
| Performing calculations | | | | |
| Checking data and inputs | | | | |
| Correcting errors | | | | |
| Processing data | | | | |
| Transmitting and publishing data | | | | |
| Internal meetings | | | | |
| External meetings | | | | |
| Payment | | | | |
| Photocopying, filing, distribution | | | | |
| Cooperating with audit by public authorities | | | | |
| Corrections following audit | | | | |
| Procuring additional information in case of audit | | | | |
| Training courses | | | | |

| | | | | |
|---|---|---|---|---|
| | | | | |
| Procuring goods and services | Pen-testing costs approx. EUR 5,000-10,000; External security services (e.g. Red Team) cost around EUR 200/hr (est. 30 hours) = EUR 5,000 | | | |
| Procuring services and/or hiring additional staff | 0.05 FTE data scientist – EUR 3,200/year | | | |
| Supplying own services | | | | |
| Adjustment of internal processes | Possible redesign of the business model to ensure reproducibility? Possible additional cost of data/information storage? | | | |
| Supervisory measures | | | | |
| Storage, inventory management, production | | | | |
| TOTAL minutes | 1,205 | 2,405 | 1,140 | 4,750 |
| Total admin cost (hourly rate = EUR 32) | | | | EUR 2,533.33 |
| Total cost | | | | EUR 10,733.33 |

**Table 2.7: Compliance cost of the proposed regulation on AI systems Requirement 5: Robustness and Accuracy, by Renda, A., et al. (2021)**

| Table 23 -Cost of all five requirements | Training data | Documents and record-keeping | Information provision | Human oversight | Robustness and accuracy | TOTAL |
|---|---|---|---|---|---|---|
| Administrative activities | | | | | | |
| Familiarisation with IO | 9 | 5 | 10 | 1 | 3 | 28 |
| Procuring data | 3 | | 6 | | 1 | 10 |
| Filling in forms, labelling, classifying | 2 | 2 | 3 | | | 7 |
| Performing calculations | 2 | | | | 2 | 4 |
| Checking data and inputs | 6 | 2 | 1 | | 2 | 11 |
| Correcting errors | 3 | 1 | | | 2 | 6 |
| Processing data | 5 | 3 | 3 | | 2 | 11 |
| Transmitting and publishing data | | 3 | 9 | | | 12 |
| Internal meetings | 5 | | 6 | 1 | 3 | 15 |
| External meetings | | 1 | 3 | 1 | 1 | 6 |
| Payment | | | | | | |
| Photocopying, filing, distribution | | | | | | |
| Cooperating with audit by public authorities | | 1 | | | | 1 |
| Corrections following audit | | | | | | |
| Procuring additional information in case of audit | | 1 | | | | 1 |
| Training courses | 1 | 1 | 1 | 1 | 2 | 6 |
| Additional costs | | | | | | |
| Procuring goods and services | Purchasing additional data (EUR 500) + additional legal advice | | | | | |
| Procuring services and/or hiring additional staff | | | | | | |
| Supervisory measures | Security testing services (EUR 5,000)<br>0.2 FTE staff– EUR 12,800/year | | | | | |
| Total minutes | 5,180.5 | 2,231 | 6,800 | 1,620 | 4,750 | 20,581.5 |
| Total admin cost (hourly rate = EUR 32) | | | | | | EUR10,976.8 |
| Total cost | | | | | | EUR 29,276.8 |

**Table 2.8: Compliance cost of the proposed regulation on AI systems Summary of the cost of all 5 requirements for each AI product, by Renda, A., et al. (2021)**

Costing AI is helpful both for the actual costs for policy appraisal and for evaluating what is being developed and its' impact, for use for public policy. There is increasing need for cross-divisional thinking on teams in this regard, to include technologists, public policy makers, financial experts, all stakeholders including citizens when determining the best use of AI technology, when developing, delivering, and reviewing the impact of AI enabled public policy.

Schneier, B., (2019) notes that technology is now deeply intertwined with policy that AI technologies have the potential to augment human decision-making, he considers AI may eventually replace subjective human processes with something fairer, more consistent, faster, and more scalable, that AI can also entrench bias and codify inequity, and act in ways that are unexplainable and undesirable. He states AI can be hacked in new ways, giving attackers from criminals and nation states new capabilities to disrupt and harm and asks, how can we avoid the pitfalls of AI while benefiting from its promise? He noted Robotics will soon be a common consumer technology, and that we are not ready for it at all. He argues that policymakers need to realize that they need technologists on their policy teams that it was never okay for technology to be separate from policy.253

#### 2.6.2.1 Artificial Governance of organisations

Hilb, M., (2020) examines the role of AI shaping the future of corporate governance for the board of directors, outlining five scenarios for artificial governance, assisted, augmented, amplified, autonomous and autopoietic intelligence, which he argues are likely to shape the governance of organizations today, tomorrow, and beyond. He states the Board of Directors is guided by five key legal considerations, accountability, liability, business judgement, data protection and regime heterogeneity, and, also, ethical considerations anticipating societal AI expectations, identifying five ethical areas: Bias in and by AI, Distribution of Wealth, Monopolization of intelligence, Values and Free will. He notes

253 Schneier, Bruce., (2019) *We must bridge the gap between technology and policy our future depends on it* Published by the World Economic Forum, Switzerland

AI, makes the board more efficient in governance, humans are still the decision-makers, that augmented intelligence AI-based solutions supported the decision-maker use the technology in a way that surpasses human intelligence, for example by identifying outliers in large amounts of data or automated reporting, improved forecasting capabilities. He describes amplified intelligence as requiring joint decisions by man and machine, that a machine makes a recommendation approved by man, the board and machine co-govern. Autonomous intelligence, is described as a governance robot, making the corporation self-govern, a machine making decisions independently and operating within a predefined range and without constant decision inputs. He cites Burridge (2017)254 describing a real case study of same in Hong Kong where Vital an AI system is one of many board members in an investment company. The fifth scenario autopoietic intelligence is described as where the AI entity can make independent decisions within a certain area, can also develop and expand this area over time, noted as not yet in existence but that it would make corporate governance self-evolve and that human intervention would no longer be needed. He discusses the implications of both governance of and governance with AI intelligence and he concludes with an appeal to board members to take an active role in understanding, imagining, and shaping the future of artificial governance, noting that it will, ultimately be the social dialogue that will be critical, and that AI will enable the introduction of a whole range of new governance mechanisms and systems.255

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254 Burridge, N. (2017). *AI takes its place in the boardroom*. Tokyo: Nikkai Asian Review. https://asia.nikkei.com/Business/AI-takes-its-place-in-the-boardroom

255 Hilb, Michael., (2020) Toward artificial governance? The role of artificial intelligence in shaping the future of corporate governance *J Manag Gov* **24, Pp.** 851–870.

'Trust but verify' is elaborated upon by Ariga, T., and Sanford, S., (2020) of the US Government Accountability Office, who state Supreme Audit Institutions (SAIs) will play a pivotal role in robust AI Governance, they ask the following questions,

> 21. How can SAIs purposefully integrate AI capabilities across audit activities in ways that move the needle towards continuous auditing and 100% sampling?
>
> 2. How will the SAIs-absent of a uniform policy and regulatory framework-approach oversight of AI solutions *when*, not *if*, they are asked to provide assurance?"

They conclude that 'trust but verify' is already a guiding principle for auditors and SAIs must look ahead and be prepared to audit algorithms in ways that include both empirical as well as inferential evidence to draw assurance. 256

#### 2.6.2.2 Algorithmic Government, Automated Decision Making

Berryhill, J., Heang, K., Clogher, R., McBride, K., of OECD (2018) note the government of Canada as part of policy making, crowdsourced research from hundreds of computer science experts and government officials, which led to the Canadian Directive on Automated Decision-Making257, noting the directive was the first of its kind in the

256 Ariga, Taka, Sanford, Stephen., USA. Government Accountability Office, (GAO)., (2020). *A if for Accountability – oversight in the age of artificial intelligence* Page 89. Ariga, Taka, Sanford, Stephen., of the GAO, USA, published by the EU, European Court of Auditors (ECA) Journal Big Data and Digital Audit. Journal No. 1 2020. Retrieved from https://www.eca.europa.eu/lists/ecadocuments/journal20_01/journal20_01.pdf (Accessed 14 May 2021)

257 Canada Government. (2020). *Directive on Automated decision making.* Canada, Government. Ottawa. Retrieved from: Directive on Automated Decision-Making-Canada.ca (tbs-sct.gc.ca) (Accessed 14 May 2021: Date website last modified 2021-04-01)

world and highlighting sample questions from the algorithmic impact assessment (AIA) tool258 as a sample case study.259

> "The Algorithmic Assessment is a digital questionnaire that evaluates the potential impact of a public-facing automated decision system. It assesses the decisions the system has the capacity to make or inform and the potential harm to citizens. The results of the questionnaire generate an impact rating on a scale of 1-4 for the decision-making system: 1 indicates decisions leading to impacts that are brief and reversible, and 4 indicates decisions leading to potential impacts that are irreversible and significant. This rating establishes the minimum level of responsibility for the organisation, and assigns mandatory governance, oversight and reporting requirements.
> Sample questions include:
> - Is the project within an area of intense public scrutiny?
> - Are clients in this line of business particularly vulnerable?
> - Will the algorithmic process be difficult to interpret or to explain?
> - Will the system be replacing a decision that would otherwise be made by a human?
> - Are the impacts resulting from the decision reversible?
> - Who collected the data used for training the system?
> - Will you have documented processes in place to test datasets against biases and other unexpected outcomes?
> - Will the system provide an audit trail that records all the recommendations or decisions made by the system?"

258 Canada Government. (2021). *Algorithmic Impact Assessment Tool.* Canada, Government. Ottawa. Retrieved from: Algorithmic Impact Assessment Tool - Canada.ca (Accessed 14 May 2021: Date website last modified 2021-04-01)

259 Berryhill, Jamie., Heang, Kévin Kok., Clogher, Rob., and McBride, Keegan., OECD., (2019). *Hello, World: Artificial Intelligence and its use in the public sector* Pages 158, 150. OECD, Observatory of Public Sector Innovation (OPSI), Paris, France, Prepared by the Directorate for Public Governance under the leadership of Marcos Bonturi. Retrieved from AI-Report-Online.pdf (oecd-opsi.org) (Accessed 14 May 2021)

The Government of Canada (2020) website stated that the algorithmic impact assessment (AIA) tool helps designers determine how acceptable their AI solutions are from an ethical and human perspective.260

Ingestad, G., (2020) Director-General for Informatics (DG DIGIT) in the European Commission highlights the scale and scope of technological change, including the rise of big data and AI, that it is important to remember that using technology is a means to serve people that there is potential to transform public administrations, to focus on user needs as never before, noting that there is an evolving accountability and transparency in policymaking, and concludes that digitally transforming European public services is not just another technical iteration, and that the audit profession, using technology has unprecedented means to deliver audits and Value for Money (VFM), also adding a 4th E to the three VFM concepts, Economy, Efficiency, Effectiveness, Ethical AI and she proposes a 5th E, Engagement, reaching out to citizens and civil society, seeking their input, analysing data in a controllable fashion, and visualising options for debate and informed decision-making noting this is technically feasible today as it never has been before.261

Moonen, G., (2020) highlights the benefits of big data and AI, that the technologies enable us to do completely new things that we are not yet even aware of, mentioning self-

260 Canada Government., (2020). *Algorithmic Impact Assessment Tool (2020),* Canada Government, Ottawa. Retrieved from: Algorithmic Impact Assessment Tool - Canada.ca (Accessed 14 May 2021: Date website last modified 2021-04-01)
An archived version of the tool is available at https://github.com/canada-ca/aia-eia (Accessed 14 May 2021)

261 Ingestad, Gertrude., (2020) *Towards a digitally transformed European Commission* Pages 13-17 DGDIGIT published in the European Court of Auditors (2020) *Journal Big Data and Digital Audit*

learning robotics, data processing and analytics noting that if these technologies disappeared today, that it would create serious problems not only for tech companies, but also for citizens and traditional businesses. He highlights the opportunities for audit to tap into the data for audit purposes, increasing the assurances they can deliver, also to address citizen concerns on what is done with their data, transparency and accountability on the safeguards used. He references digital systems opportunities and that 'one continuously needs to connect the digital means with the humanware,' that this is where auditors will have to use their professional judgement, and a wide variety of skills will be needed for the future auditor to apply several criteria, including fairness - sometimes also called 'common sense', that this will also require courage and imagination. He closes with a thought that resonates, an echo from the past into today, stating, as John Maynard Keynes already pointed out in the 1930s: 262

> 'The difficulty lies not in the new ideas, but in escaping the old ones, which ramify, for those brought up as most of us have been, into every corner of our minds.'263

Andersen, K. N., Lee, J, and Henriksen, H. Z. (2020) highlighted that in an increasingly digital world, workers can be empowered and more productive, also that AI, ML and Robotics, can be seen by employees as being better than humans, and in consequence humans can lose control. They name this condition 'digital sclerosis. They state that 'office workers, healthcare professionals, bankers, and lawyers face that machine

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262 Moonen, Gaston., (2020) *Foreword Journal Big Data and Digital Audit* Pages 6-7 DGDIGIT published in the European Court of Auditors (2020) *Journal Big Data and Digital Audit*

263 The Quotation Page Classic Quotes (1994-2018) John Maynard Keynes on *The General Theory of Employment, Interest and Money (13 December 1935) English economist (1883 - 1946)* http://www.quotationspage.com/quote/38205.html

learning and robotics are entering their offices', that, 'contrary to their human counterparts, they are not hanging out at the cafeteria or coffee machine or taking bathroom breaks' noting the increasing evidence that, digitalization, AI, machine learning and Robots, means workers are being alienated from the core values of their work. They concluded that, 'to respond proactively and take preventive care initiatives, policy makers and systems developers need to be sensitized about the digital sclerosis, prepare the technology, and design intelligent augmentations in a flexible and agile approach.'264

Misuraca. G., and van Noordt, C., (2020) reference this study stating that, as a guiding principle for the entire stream of research on AI in public services, there is need to integrate a **public value perspective** by looking at the 'value drivers' informing current initiatives and strategies of AI use in public services. 265

### 2.6.3 Public Sector Corporate Governance frameworks governance of AI, governance by AI conclusion

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264 Andersen, Kim. Noorman, Lee, Jungwoo., and Henriksen, Heller. Zinner. (2020). *Digital Sclerosis? Wind of Change for Government and the Employees.* Pages, 1, 8, 9. *Digit. Gov.: Res. Pract.*, *1*(1), 1–14. https://doi.org/10.1145/3360000 (Accessed 30 May 2021)

265 Misurca, Gianluca., and van Noordt, Colin., (2020). *AI Watch – Artificial Intelligence in Public Services: Overview of the use and impact of AI in Public Services in the EU.* Pages 39, 41, 59. European Union, European Commission, Publications Office, Luxembourg, ISBN 978-92-76-19540-5 (online), doi:10.2760/039619 (online), JRC120399 EUR 30255 EN. Science for Policy Report of the Joint Research Centre (JRC). European Union, European Commission. Available at: https://publications.jrc.ec.europa.eu/repository/bitstream/JRC120399/jrc120399_misuraca-ai-watch_public-services_30062020_def.pdf (Accessed 14 May 2021)

Current policy discourse focusses on the governance of AI and far less on governance with/by AI and many case studies on same are highlighted ((Misurca, G., and van Noordt, G. (2020), Hilb, M. (2020), Shajii, A. K. (2019), and Burridge, N. (2017)).

The benefits in Financial Governance and AI use for asset management, anomaly detection, AML, fraud prevents, credit scoring although an AI fitness check of the current regulatory framework is noted as a need today (CCAF and World Economic Forum (2020) EBF (2019), Schmid, D., (2019)). Survivorship Bias is considered in AI used and data relating to minority loans (Cayle, K. 2019) and policy Schneier, B. (2019). Climate risks relating to technology redundancy and factoring this into fiscal policy PEFA (2020) and the role of AI in public trust in the fiscal accountability of government, also audit (Renda, A., et al. (2021), Pazzanse, C., (2020), Ingestad, G. (2020), Moonen, G., (2020), Ariga, T., and Stanford. S., (2020), Popp, A., (2019).

The Canadian Government ((2021) (2020)) Directive on Automated Decision-making was the first of its kind in the world and its Algorithm Impact Assessment tool is available for all to use.

Question 5

*What are the ethics and GDPR implications, where AI algorithms are used in financial information to determine government policy or taxation?*

## 2. 7 What are the ethics and GDPR implications, where AI algorithms are used in financial information to determine government policy or taxation?

Governments raise taxes annually. The budget process is part of this as the taxation is levied together with other financing modes (borrowing) to enable government expenditure on government goods and service provision, to implement government policy. Budget Software with AI-enhanced Planning and forecasting exists for example, the BudgetFYI software features include short-term budgets, longer-term forecasts, specialty budgets which provide alternative views of the business, audit trails, automated consolidation rollups, based on actual reporting structures, also, multiple budget scenarios which can be worked on simultaneously, noting that AI makes it easier to predict trends and make decisions.266

### 2.7.1 Ethics, GDPR and AI algorithms

Sartor, G. (2020) reporting for the European Parliamentary Research Service (EPRS) (2020) noted that AI is not explicitly mentioned in the EU GPDR, that a tension exists between traditional data protection principles, purpose limitation, data minimisation, special treatment of 'sensitive data', limitations on automated decisions and the full deployment of the power of AI.267

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266 FYISoft., (2021). *Budgeting Software with AI-Enhanced Planning and Forecasting.* Retrieved from: https://www.fyisoft.com/budgeting-software/ (Accessed 14 May 2021)

267 Sartor, Giovanni., and EU, European Parliament Think Thank., Panel for the Future of Science and Technology., (2020). *The Impact of the General Data Protection Regulation on Artificial Intelligence.* Sartor, Giovanni Florence, Italy, EU, European Parliament Think Tank, France, and Luxembourg. Retrieved from: The impact of the General Data Protection Regulation (GDPR) on artificial intelligence - Think Tank (europa.eu) (Accessed 14 May 2021)

Sartor, G. and Lagioia. F., of the European Parliament (2020) state GDPR generally provides meaningful indications for data protection relative to AI applications, and can be interpreted and applied in such a way that it does not hinder beneficial application of AI to personal data, also noting, GDPR does not place EU companies at a competitive disadvantage when compared with non-EU countries and does not seem to require any major change to address AI matters. They raised concerns about GDPR, and AI, highlighting an emerging ethics framework and noted.

> "A framework is emerging, in which traditional ethical ideas, such as respect for human autonomy, prevention of harm, and fairness are combined with specific and somehow technical requirements concerning transparency, explicability, robustness and safety."

> "As a pervasive and multifaceted technology, AI may either enhance or impair the exercise of multiple fundamental rights: privacy and data protection, civil freedoms, and social rights. It can also contribute to, or detract from, the realisation of different social values, such as democracy, welfare, or solidarity."

> "Given the complexity of the matter and the gaps, vagueness and ambiguities present in the GDPR, controllers should not be left alone in this exercise. Institutions need to promote a broad social debate on AI applications, and should provide high level indications/

The report notes that AI is already used in financial forecasting, financial investment, and granting of loans and concludes that:

Data protection authorities need to actively engage in a dialogue with all stakeholders, including controllers, processors, and civil society, to develop appropriate responses, based on shared values and effective technologies. Consistent application of data protection principles, when combined with the ability to use AI technology efficiently, can contribute to the success of AI applications, by generating trust and preventing risks.268

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268 Sartor, Giovanni., and Lagioia, Francesca., Dr. of the EU, Scientific Foresight Unit, within the Directorate-General for Parliamentary Research Services (EPRS) of the Secretariat of the European Parliament., (2020). EU, European Parliament ERPS (2020) *The Impact of the General Data Protection Regulation (GDPR) on artificial intelligence.* Pages, III, 22, 73, 79, 80, 81. Sartor, Giovanni., Lagioia, Francesca., EU, European Parliament, ERPS, France, and Luxembourg. Retrieved from:

The OECD (2019) report on the policy forum, state blockchain can enhance privacy and data protection, and may address some of the gaps in the traditional model, including access, speed, cost, transparency, and security. They noted also that data subjects may not be able to exercise certain individual rights granted by existing privacy and data protection laws, such as for instance the "right to erasure" ("right to be forgotten") given the immutable nature of blockchain and distributed ledger technologies (DLTs), that in the case of public permissionless blockchain and DLTs, an individual may not have a specified point of contact for redress, that, the challenges were not unique to blockchain and other DLTs,. They note some legal inherent uncertainties in current privacy and data protection frameworks and recommend that a case-by-case assessment of risk and benefit and appropriate use of technology be undertaken, to ensure that blockchain and DLTs can be adopted without violating the law and the privacy rights of individuals.269

The European Parliament (2020) comment on a tension existing between traditional data protection principles and full deployment of the power of AI. But they also state it is possible to interpret apply and develop those data protection principles consistent with beneficial uses of AI noting that 'a number of AI related data protection issues are not explicitly answered in the GDPR'. They state no major changes to the GDPR are needed to address AI. They ask in relation to processing personal data using AI, for a broader

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https://www.europarl.europa.eu/RegData/etudes/STUD/2020/641530/EPRS_STU(2020)641530_EN.pdf (Accessed 14 May 2021)

269 OECD, Policy Environment for Blockchain Innovation and Adoption., (2019). *2019 Global Blockchain Policy Forum Summary Report.* Pages, 10, 36, 38, 39. OECD, Paris, France, Blockchain Policy Series. www.oecd.org/finance/2019-OECD-Global-Blockchain-Policy-Forum-Summary-Report.pdf (Accessed 14 May 2021)

debate as to which applications should be barred unconditionally and which ones be allowed under specific circumstances and controls and reference AI and big data in the context of challenges to GDPR and goals for GDPR. AI and big data challenges to GDPR are noted as, data minimisation, storage limitation, specific granular consent, information explanation transparency, non-discrimination and fairness, special protection for sensitive data, and purpose limitation. AI and big data goals for GDPR are identified in the context of AI, GPPR, and Guidance and noted as, human agency and oversight, technical robustness and safety, privacy and data governance, transparency and explanation, diversity, non-discrimination and fairness, societal and environmental well-being, and accountability.270

Ivanova, Y., (2020) argues that the GDPR may provide an effective legally binding mechanism to enforce non-discriminatory AI systems, that the Data Protection Impact Assessment is a 'powerful tool to prevent ex ante algorithmic discrimination, establishing a legal standard for duty of care, and holding the controller accountable to avoid discrimination when designing and using AI systems. Having an ethical review board was noted as one prevention and mitigation measure and for testing and validation an assessment of whether human, or automated decision-making will generate overall greater

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270 European Union, European Parliament (2020) Science and Technology Options (STOA) brief The Impact of the General Data Protection Regulation (GDPR) on artificial intelligence Pages 1, 2, 3, 4. Retrieved from:

https://www.europarl.europa.eu/RegData/etudes/STUD/2020/641530/EPRS_STU(2020)641530(ANN1)_EN.pdf This briefing is based on the study by Sartor, Giovanni., and Lagioia, Francesca., Dr. of the EU, Scientific Foresight Unit, within the Directorate-General for Parliamentary Research Services (EPRS) of the Secretariat of the European Parliament., (2020). EU, European Parliament ERPS (2020) *The Impact of the General Data Protection Regulation (GDPR) on artificial intelligence.*

accuracy and minimize bias proposing a methodological framework for assessing the risks of automated data processing to the right to non-discrimination, providing controllers with an indicative guidance about the main sources of risks and the potential measures to prevent and mitigate algorithmic discrimination. 271

Kaminski, M., and Malgieri, G., (2020) note the concerns of policymakers, scholars and commentators and show how a Data Protection Impact Assessment can be applied as an Algorithmic Impact Assessment linking both facets of the GDPR regulation, algorithmic accountability and individual rights and systemic governance. They highlight the importance of spot checks to monitor, improve and identify substantive problems with algorithmic decision-making. They argued DPIAs should as a matter of good practice actually be continuous and should be 'updated throughout the lifecycle [of the] project', that they should be re-assessed or revised at least every three years. Noting in a footnote that 'carrying out a DPIA is a continual process, not a one-time exercise', per the DPIA Guidelines noting that Article 29 Data Protection Working Party, Guidelines on Data Protection Impact Assessment (DPIA) and determining whether processing is 'likely to result in a high risk' for the purposes of Regulation 2016/679, 14'. They stated the DPIA continual process involves assessing risk, deploying risk-mitigation measures,

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271 Ivanova, Yordanka., (2020). *The Data Protection Impact Assessment as a Tool to Enforce Non-discriminatory AI.* Pages, 1, 11, 13, 17. Retrieved from: The Data Protection Impact Assessment as a Tool to Enforce Non-Discriminatory AI by Yordanka Ivanova :: SSRN Article in SSRN Electronic Journal · January 2020 DOI: 10.2139/ssrn.3584219 (Accessed 14 May 2021).

documenting their efficacy through monitoring, and feeding that information back into the risk assessment.272

O'Leary, D. (1991) highlighted, that accounting databases have become vast storehouses of limited information about specific accounting transactions, that to meet decision makers' needs, one approach to this problem would be to integrate AI into accounting databases to try to develop systems that mitigate the difficulties of traditional systems.273

### 2.7.2 Ethics and Taxation and AI algorithms

Huang, Z., (2018) noted an AI based forecasting and statistical model for tax auditing has been created in China and whilst highlighting the problems of using AI in taxation in China, that in the field of taxation, AI can enhance the effectiveness of automated tax auditing and decision-making and play an essential role in supervision and

272 Kaminski, Margot. E., and Malgiere, Gianclaudio., (2020). *Algorithmic impact assessment under the GDPR producing multi-layered explanations.* Pages 3, 6, 7, 16, 17, 18. Published 06 December 2020. Oxford University Press, UK. Retrieved from: https://academic.oup.com/idpl/advance-article/doi/10.1093/idpl/ipaa020/6024963 (Accessed 14 May 2021)

273 O' Leary, Daniel., (1991). Artificial Intelligence and Expert Systems in accounting Databases: Survey and Extensions. Page 1. O' Leary, Daniel., Los Angeles, California, USA, Expert Systems with Applications, V. 3, p. 143-152 1991. Expert Systems With Applications, Vol. 3, p. 143-152, 1991 Printed in the USA, 0957--4174/91 $3.00 + .00 © 1991 Pergamon Press plc. (Accessed 14 May 2021)

monitoring by government. He concludes that the development of AI is an unstoppable trend.274

The OECD (2020) global Forum on Transparency and Exchange of Information for Tax Purposes is the leading international body working on the implementation of global transparency and exchange of information standards around the world275, reported that transparency and exchange of information continue to deliver and generate much needed tax revenues, at least EUR 107 billion in additional revenue (tax, interest, penalties) have been identified worldwide through voluntary disclosure programmes and offshore tax investigations of which EUR 29 billion were reported by developing countries.276

The UN (2020) state that inequality has moved to the forefront of the policy debate. One area focused on, is technological change which the UN notes, tends to create winners and losers, and its current pace brings new and urgent policy challenges for navigating uncharted territories. They note that technology advances can replace jobs but also, state that new technologies also generate new jobs and tasks, including those necessary to use,

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274 Huang, Zhuowen., (2018). *Discussion on the development of AI in taxation.* Abstract and Paragraph 1.2 Development of Artificial Intelligence in Taxation. Retrieved from: https://www.scirp.org/journal/paperinformation.aspx?paperid=86895 *American Journal of Industrial and Business Management*, **8**, 1817-1824. doi: 10.4236/ajibm.2018.88123. (Accessed 14 May 2021)

275 OECD., *Global Forum on Transparency and Exchange of Information for Tax Purposes.* (2020). *Putting an End to Tax Evasion.* OECD, Paris, France. As reported on the OECD forum website. Retrieved from: https://www.oecd.org/tax/transparency/ (Accessed 14 May 2021)

276 OECD., *Global Forum on Transparency and Exchange of Information for Tax Purposes.,* (2020). *Annual Report 2020* Page 3. OECD, Paris, France. Retrieved from: global-forum-annual-report-2020.pdf (oecd.org) (Accessed 14 May 2021)

test, supervise and market new products and services. Digital innovation and artificial intelligence are opening-up opportunities in sectors including education, banking, with far-reaching implications for equality. They noted that use of the Internet and mobile phones is enabling more people in developing countries to access financial services and that open online courses can help democratize access to education. They call for three key policy interventions:

(1) invest in skills that enable workers to perform new tasks over a lifetime of changing work environments highlighting that once only education at a young age is no longer sufficient.

(2) Support people through work and life transitions, including through universal access to social protection.

(3) Strengthen efforts to bridge technological divides within and among countries.

They noted any country's action/non-action on climate change or international migration has benefits and costs for other countries. They highlight other challenges that affect inequality within and among countries, including tax evasion and note that fiscal and monetary policies can encourage greater equality also mobilizing resources for social policies including social protection noting that the way in which taxes and expenditures are allocated is at the heart of the social contract.277

277 UN, Department of Economic and Social Affairs., (2020). *World Social Report 2020, Inequality in a rapidly changing world. Executive Summary.* Pages 2, 5-7, 10, 13, 14, 15. UN, Geneva, Switzerland. Retrieved from: World-Social-Report2020-ExecutiveSummary.pdf (un.org)Sales No. E.20.IV.1 ISBN 978-92-1-130392-6 eISBN 978-92-1-004367-0 (Accessed 15 May 2021)

The OECD (2019) state one of the biggest issues in the world today is wealth distribution inequality and referencing the 'Good Dollar' Universal Basic Income (UBI) experiment a virtual currency and opportunity for merchants to provide goods and services for social good, and a suggestion to address this issue is to introduce a Universal Basic Income (UBI) and that blockchain creates a new opportunity to facilitate this by creating a trustworthy and universal currency which is not tied to national governments, and that blockchain also enables smart contract use to build code into money, remove/reduce fees and dencentralise control.

They state that modern health systems are awash in electronic data that blockchain-based health systems have the potential to leverage data, to move healthcare away from an "encounter-centric" model, to an "engagement-centric" model, which is focused on the individual, by providing rich, and portable data sets for patients, they cite Estonia as an example, where they note e-Health records use blockchain to ensure data integrity and manage access to data, acting as a "bridge" between health data silos. They noted that consent for secondary use of health data is often given one time, is static; that it does not reflect the incremental nature of trust or changing perspectives of patients, that the concept of erasure of data under the EU General Data Protection Rights does not interact well with the needs of patients and healthcare providers they give as examples, issues of liability and malpractice. interoperability is not just about technology, but process and policy, and that the industry needed regulatory and policy 'interoperability' to realise the opportunities to drive better access management and consent.

They observe that blockchain is creating entirely new business models, helping people rethink existing businesses, and, how they can be more efficient, transparent, and

secure. They noted that distributed ledger technology (DLT) presents both risks and opportunities in a world where policymakers are exploring, data and privacy protection frameworks. They query, from privacy in finance, to facilitating personal data sharing, what new tools DLT can offer, asking how do we find the right balance between personal privacy and transparency for law enforcement purposes and ask, with data as the gold of the internet age, how will existing business models shift and new business models emerge as mass adoption of DLT becomes reality?278

Zheng, S., (2020) is part of a research team that released an AI tool called AI Economist. The AI Economist is an open-source framework for economic policy design. It uses a two-level machine learning through reinforcement model which is designed to optimize any social objective. and creates AI-driven tax policy recommendations. This is highlighted as a step towards AI powered economic models. It is in the early stages of development. The model designs tax policies to achieve equality and productivity goals set by government by advising on subsidies and how to redistribute wealth.

The question is asked, if AI could build a tax system that supports equality. Noting that taxation is a common tool for national and local governments to redistribute wealth, a near-universal part of society, he references a new open-source tax modeling project called the AI Economist, 'Moonshot' Goal.279

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278 OECD., (2019), The Policy Environment for Blockchain Innovation and Adoption: 2019 OECD Global Blockchain Policy Forum Summary Report, OECD Blockchain Policy Series. Pages 11-12, 36-38. OECD, Paris, France. Retrieved from: www.oecd.org/finance/2019-OECD-Global-Blockchain-Policy-Forum-Summary-Report.pdf (Accessed 15 May 2021)

279 Zheng, Stephen., (2020). *Can AI Build a Tax System That Supports Equality?* Paragraph 4. Published by Brink, Zheng, Stephen., Retrieved from: Can AI Build a Tax

Sustainability isn't built in yet. They ask for the public to be involved, policy experts to highlight societal issues they want addressed, economists and AI researchers.

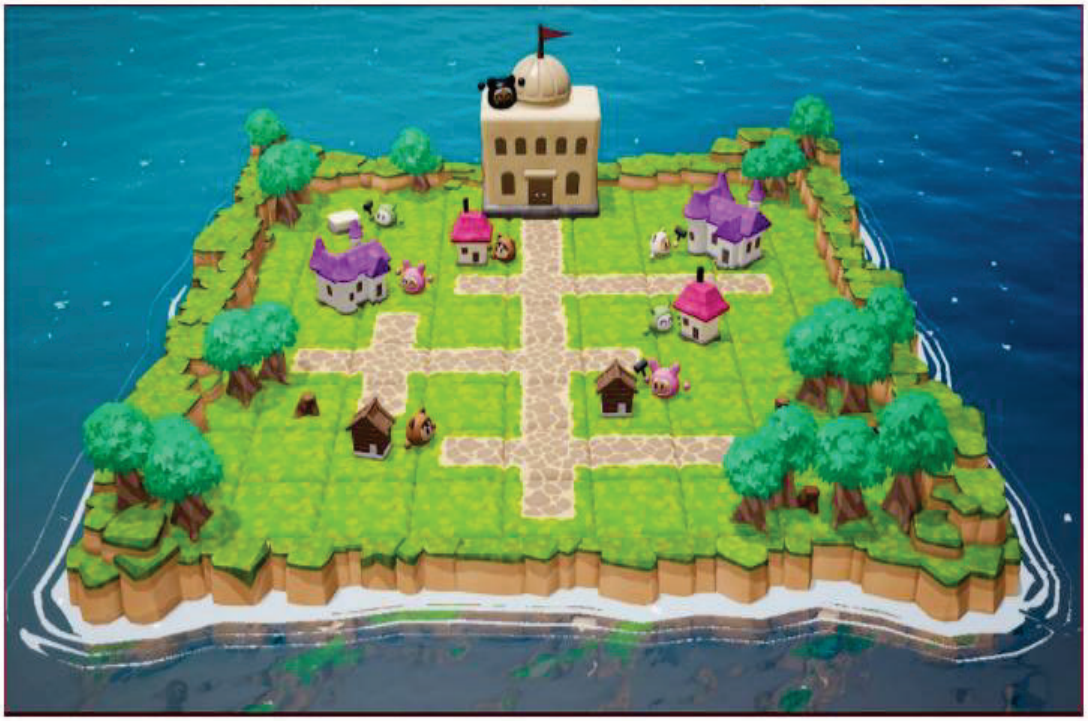

**Figure 2.32: AI Economist Moonshot by Zheng, S., Salesforce (2020)**

Zheng, S., (2020) noted that the project is to *build a reinforcement learning framework that will recommend economic policies that drive social outcomes in the real world*, such as improving sustainability, productivity, and equality that through the AI enabled open-source framework for Economist they aim to develop an AI social planner

System That Supports Equality? – BRINK – News and Insights on Global Risk (Accessed 15 May 2021)

that optimizes economic policies and improves social welfare in the real world and noting the following objectives:

> **"Economics**: Improve social welfare by designing economic levers across monetary policy, fiscal policy, sustainability, and beyond.
>
> **Machine Learning:** Complement analytical approaches to economic design with effective, robust, and explainable machine learning techniques that are validated with real data.
>
> **Engineering**: Build fast, efficient, and modular economic simulations grounded in real-world data.
>
> **Trusted AI**: Develop ethical solutions that are responsible, accountable, transparent, empowering, and inclusive. 280

They are open sourcing the AI Economist with the goal of developing a next-generation AI Economist that would allow policy makers and researchers to 'Scale-up to richer world models and study choices between multiple kinds of policy levers' to 'objectively analyze the impact of various kinds of economic policy, serving to ground policy discussions in principled simulation and reduce ideological bias,' and 'be more flexible in the choice of design objective that this can serve to focus discussions around the choice of policy goals and constraints, for example, tradeoffs in equality and productivity. 281

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280 Zheng, Stephen., (2020). *AI Economist Moonshot Project.* Zheng, Stephen., Salesforce Asia, Suntec City, Singapore, Pala Alto, California, USA. Retrieved from: The AI Economist: Join the Moonshot (einstein.ai) © Copyright 2020 Salesforce.com, Rights of ALBERT EINSTEIN are used with permission of The Hebrew University of Jerusalem. Represented exclusively by Greenlight.

281 Zheng, Stephen., (2020). *AI Economist Moonshot Project.* Zheng, Stephen., Salesforce Asia, Suntec City, Singapore, Pala Alto, California, USA. Blog. Einstein AI. Retrieved from: The AI Economist: Join the Moonshot (einstein.ai) © Copyright 2020 Salesforce.com, Rights of ALBERT EINSTEIN are used with permission of The Hebrew University of Jerusalem. Represented exclusively by Greenlight.

The OECD (2021) Forum on Tax Administration (FTA) first developed a tax maturity model in 2016, to help tax administrations assess digital maturity in the areas of natural systems/portals and big data. In designing the maturity models the FTA note it was decided to use the middle term 'established' on the maturity models' frameworks to provide a description of where on average FTA members would be expected to cluster. Since then, OECD has developed 4 maturity models, all reference Artificial Intelligence only in the most mature level 'aspirational'. 282

### 2.7.3 Ethics and GDPR, AI in government policy, taxation, conclusion

The ethics and GDPR implications where AI algorithms are used in financial information to determine government policy or taxation are noted in current case studies, GDPR provides meaningful indicators for data protection relating to AI, and there is an emerging framework in which traditional ethical ideas, human autonomy, prevention of harm and solidarity are combined with technical requirements, including, transparency, explicability ((European Parliament STOA, 2020) (European Parliament, Sartor G. and Lagioie, F. (2020), European Parliament, Sartor G. (2020)), Data Protection Impact assessment (DPIA) used to prevent and execute algorithmic discrimination and an ethical review board (Ivanova, Y., 2020) and use as an algorithmic impact assessment tool to link algorithmic accountability individual rights and systemic governance (Kaminiski, M. & Malegierei, G., (2020) is noted.

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282 OECD, Forum on Tax administration., (2021), *Tax Administration Maturity Model Series*. OECD, Paris, France, Retrieved from: https://www.oecd.org/tax/forum-on-tax-administration/about/maturity-model-series.htm (Accessed 30 May 2021) Enterprise Risk Management Maturity Model 2021, Tax Crime Investigation Maturity Model 2020, Tax Debt Management Maturity Model 2019, Tax Compliance Burden Maturity Model 2019,

Addressing wealth distribution inequality through ‘Universal Basic Income’, (OECD, 2019) fiscal and monetary policy and the way taxes and expenditure is allocated is noted as at the heart of the social contract (UN, 2020).

Integrating AI into accounting databases and tax modelling, budgeting exists today, (FYI Software, 2021) (IBM, 2021), (ORACLE 2021), (Huang, Z. 2018)) and has been noted as a need for decades, (O’Leary 1991) The OECD tax maturity models reference AI only at the maturity level ‘aspirational’ (OECD, 2021) but the future AI for example the Moonshot project, highlights that more needs to be done (Zheng, S., 2020). Blockchain use can enhance privacy and data protection and new business models emerge as mass adoption of DLT becomes reality (OECD, 2019).

Question 6

*Does AI robotics and machine learning, automation of financial data, and Blockchain result in better financial data and better decision making in public policy?*

## 2.8 Does AI robotics and machine learning, automation of financial data, and Blockchain result in better financial data and better decision making in public policy?

"Change can be frightening, and the temptation is often to resist it. But change almost always provides opportunities - to learn new things, to rethink tired processes, and to improve the way we work."283

Misurca, G., and van Noordt, C., (2020) state that governments across the EU member and associated states are exploring the potential of AI use to help reorganize the internal management of public administration at all levels, but, noted that there seems to be an imbalance between the transformative potential and the effective adoption, and use of AI solutions in governmental organisations, and there is little evidence of the social and economic impacts achieved so far, but also noted, the interest on the use of AI within European governments to support redesigning internal processes and policy-making mechanisms, also, to improve public service delivery and engagement with citizens.284

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283 Brainy Quote (2001-2021) Schwab, Klaus., Retrieved from: https://www.brainyquote.com/quotes/klaus_schwab_745774 (Accessed 15 May 2021) Copyright 2001 - 2021 Brainy Quote All rights reserved.

284 Misurca, Gianluca., and van Noordt, Colin., (2020) *AI Watch – Artificial Intelligence in Public Services: Overview of the use and impact of AI in Public Services in the EU.* Page 80. European Union, Publications Office, Luxembourg, ISBN 978-92-76-19540-5 (online), doi:10.2760/039619 (online), JRC120399 EUR 30255 EN. Science for Policy Report of the Joint Research Centre (JRC). European Union, European Commission. Available at: https://publications.jrc.ec.europa.eu/repository/bitstream/JRC120399/jrc120399_misuraca-ai-watch_public-services_30062020_def.pdf (Accessed 14 May 2021)

### 2.8.1 Public Policy Cycle, Elected Representative, Civil/Public Servants, Citizens, and the AI Policymaker

Human Rights are enshrined under the UN Universal Declaration of Human Rights 1948. Article 21 includes the will of the people should be the basis of government authority directly or through freely, elected representatives and Article 29 refers to democratic society.285

The Public Policy cycle involves elected representatives, civil/public servants, and citizens. Many models exist to demonstrate this cycle. The Think Tank for Action on Social Change (TASC), Ireland, noted citizen involvement at five key stages that policymakers and everyone involved at each stage go through identifying areas of policy that deserve their attention and addressing them. (1) A problem is identified, (2) Solutions are identified, (3) A policy decision is adopted, (4) Actions to make the policy work are implemented, and (5) The policy is monitored, changed, updated.286

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285 UN (1948,) *Universal Declaration of Human Rights* Pages 44, 60. UN, Geneva, Switzerland Retrieved from: https://www.un.org/en/udhrbook/pdf/udhr_booklet_en_web.pdf (Accessed 30 May 2021) [This illustrated booklet was published by the UN in 2015]

286 Think Tank for Action on Social Change (TASC)., (2016). *A toolkit to open government a guide to policy making.* Pages 5, 6. TASC, Dublin, Ireland. Retrieved from https://www.tasc.ie/assets/files/pdf/tasc_2016_policy_making_guide_final.pdf (Accessed 30 May 2021)

Information note: https://www.internationalbudget.org/groups/tasc/

TASC is an independent, progressive think-tank with a focus on economic equality and democratic accountability. TASC engages in a wide range of policy research analyzing Ireland's national budget and publishes an alternative budget. TASC's work includes 'equality proofing' of budget measures.

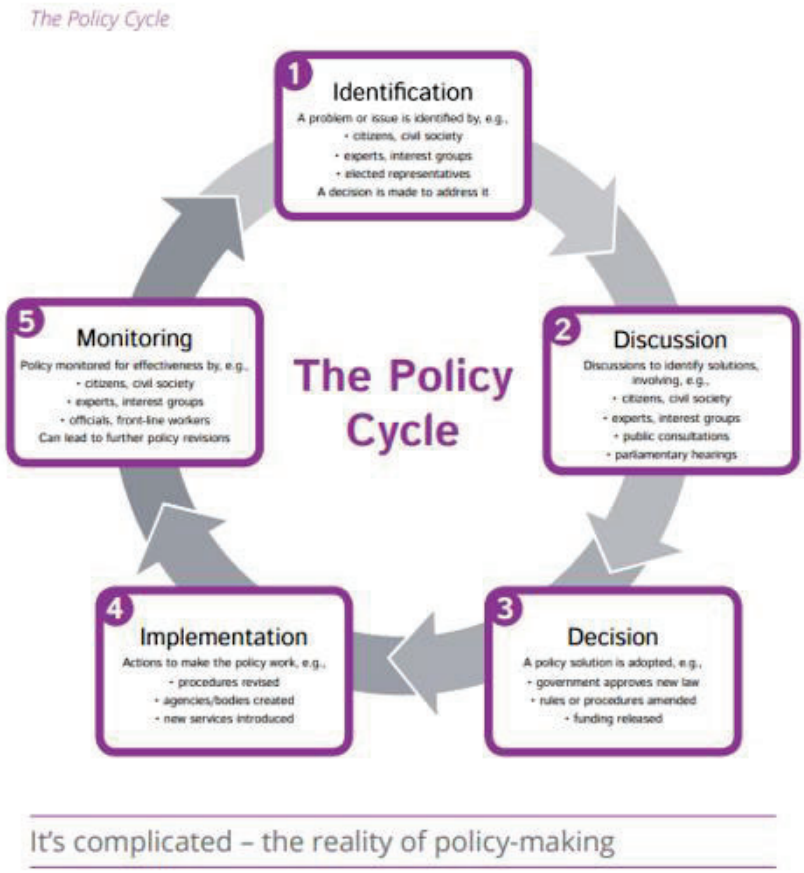


**Figure 2.33: The Policy Cycle by the Think Tank for Action on Social Change (TASC), Ireland (2016)**

These days AI also plays a significant role in Public Policy development. The Victorian Parliament in Australia, elected representatives, for example, acknowledge this and developed an AI Primer, noting that they had established an All-Party Group on Artificial Intelligence to learn more about this technology and the impacts it will have on Victorians in the future. They highlighted the opportunities, significantly enhancing economic productivity, and improved public services, noting the possible scientific and technological breakthroughs in medicine, education, transport and finance. They also identify risks including the potential loss of jobs and disruption to employment markets,

concerns about accountability and privacy, and that the ability of AI to enhance or replace human decision making raises important legal and ethical questions.287

Griffin, M., (2021) states that AI will play an increasingly central role in both government policy making and governing, as China rolled out their first AI policy maker. He states this AI policy maker operates as a strategic decision support system, and that when a policy maker needs to make a quick, accurate decision to achieve a specific goal in a complex urgent situation, the system can provide a range of options with recommendations for the best move, sometimes in the blink of an eye. He notes other nations are conducting similar AI research. 288

Springorum, S., Mangalam, S., and Vranic, G. (2019) reviewed over 50 case studies of regulation impact analysis (RIA) globally and noted the disrupting impact of new technologies and evolving business models, raising concern that the traditional regulatory approaches cannot respond effectively to innovation, also noting the dynamics of working relationships that are emerging in economies around the world. They used their maturity model framework and taxonomy structure mapping the Regulatory Cycle, (rulemaking, regulatory delivery, monitoring and feedback), with Technology Application, (data collection, data transmission and data analysis). They noted that AI, machine learning

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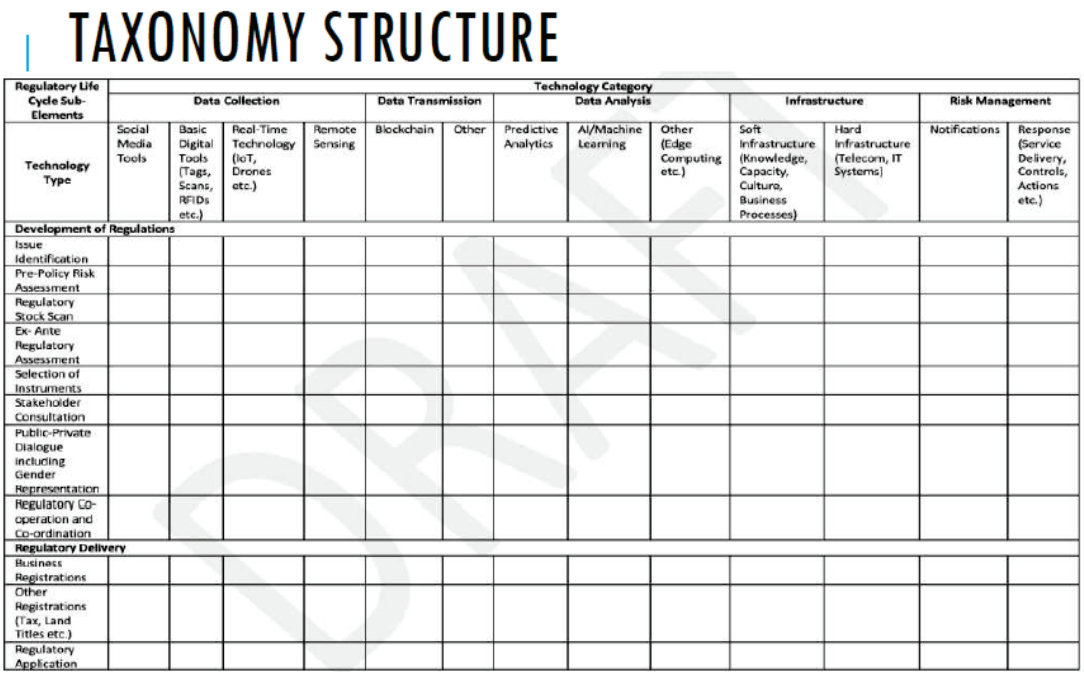
287 Parliament of Victoria, Australia., (2018) *Artificial Intelligence Primer*. Page 1. Parliament of Victoria, Melbourne, Australia. Retrieved from https://apo.org.au/organisation/179006 (Accessed 30 May 2021)

288 Griffin, Matthew., (2018). *World's first AI government policy maker gives China a diplomatic advantage.* Paragraphs 1, 9, 10, 15. Griffin, Matthew. FanaticalFuturist.com online Retrieved from World's first AI government policy maker gives China a diplomatic advantage – By Futurist and Virtual Keynote Speaker Matthew Griffin (fanaticalfuturist.com) (Accessed 30 May 2021)

and/or natural language processing, real-time technologies, social media, crowdsourcing tools and blockchain technology use across the regulatory cycle were evident.




| Regulatory Life Cycle Sub-Elements | Technology Category | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Data Collection | | | | Data Transmission | | Data Analysis | | | Infrastructure | | Risk Management | |
| Technology Type | Social Media Tools | Basic Digital Tools (Tags, Scans, RFIDs etc.) | Real-Time Technology (IoT, Drones etc.) | Remote Sensing | Blockchain | Other | Predictive Analytics | AI/Machine Learning | Other (Edge Computing etc.) | Soft Infrastructure (Knowledge, Capacity, Culture, Business Processes) | Hard Infrastructure (Telecom, IT Systems) | Notifications | Response (Service Delivery, Controls, Actions etc.) |
| **Development of Regulations** | | | | | | | | | | | | | |
| Issue Identification | | | | | | | | | | | | | |
| Pre-Policy Risk Assessment | | | | | | | | | | | | | |
| Regulatory Stock Scan | | | | | | | | | | | | | |
| Ex- Ante Regulatory Assessment | | | | | | | | | | | | | |
| Selection of Instruments | | | | | | | | | | | | | |
| Stakeholder Consultation | | | | | | | | | | | | | |
| Public-Private Dialogue including Gender Representation | | | | | | | | | | | | | |
| Regulatory Co-operation and Co-ordination | | | | | | | | | | | | | |
| **Regulatory Delivery** | | | | | | | | | | | | | |
| Business Registrations | | | | | | | | | | | | | |
| Other Registrations (Tax, Land Titles etc.) | | | | | | | | | | | | | |
| Regulatory Application | | | | | | | | | | | | | |

**Table 2.9: New Technologies in Regulatory Delivery Taxonomy Structure by the Public Risk Management Institute (2019)**

They highlighted technological and market convergence is increasing market distortion and that prescriptive ex-ante regulatory regimes are no longer effective in the face of the pace of innovation, asking questions including: How are innovative technologies influencing regulatory rule-making and regulatory delivery models and how can these technologies support achieving investment in climate reform objectives? 289

289 Springorum, Stefanie., of Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), Mangalam Srikanth., Public Risk Management Institute, Vranic, Goran., World Bank Group., (2019). Use of New technologies in Regulatory Delivery Summary Note and Detailed Case Studies in Slides 4-14. Presentation given in Vienna BEWG Meeting Tuesday 11 June 2019. Published by Donor Committee for Enterprise Development. Retrieved from: https://www.enterprise-development.org/wp-content/uploads/03-BER-and-Regulatory-Delivery-Presentation.pdf (Accessed 16 May 2021)

Shafran, M., Kaufman, A., Kochukrishnan, A., Johnson, S. E., and Muduli, S, (2020) developed an AI enabled Regulatory Impact Assessment (RIA) System prototype, its capabilities are described as: Maintain a repository of regulators, regulations and obligations; Parse documents and Optical Character Recognition (OCR) capability by connecting to Google Vision and to Regulations AI engine to get obligation classification determining categories from AI by using the National Institute of Standards and Technology (NIST) classification; (1) Rich Reporting; (2) Manage workflows tracking regulatory compliance to closure; (3) Information for regulators, (4) builds compliance reports; (5) Information for Line of Business Units; (6) proving compliance information; (7) Risk and Compliance Information from a coverage and effectiveness perspective. 290

290 Shafran, Michael., Kaufman, Alexa., Kochukrishnan, Anoop., Johnson, Sarah Evelynn., Muduli, Sunil (2020) AI Enabled Regulatory Impact Assessment System (RIA) Retrieved from: https://devpost.com/software/ai-enabled-regulatory-impact-assessment-system-ria DevPost AppianWorld20 Hackathon **https://youtu.be/BdOI32aVrGI**

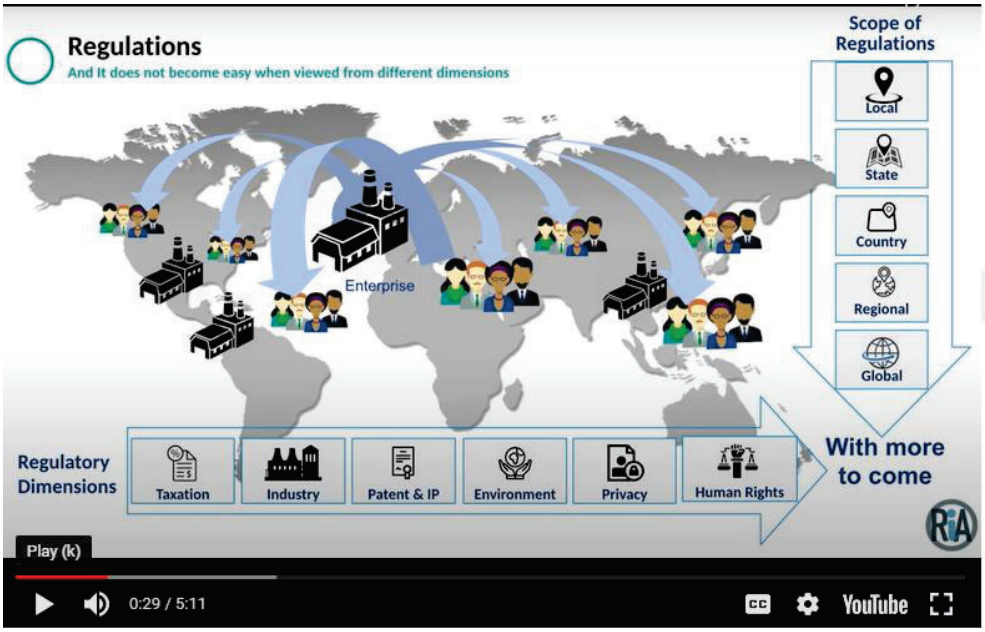



**Figure 2.34: AI Enabled Regulatory Impact Assessment System, by Shafran, M et al. (2020) https://youtu.be/BdOI32aVrGI**

The Alan Turing Institute (2021) noted, in a world of changing and interlinked policy measures, data science and AI can provide unprecedented policy makers insights from identifying policy priorities by systems modelling, to evaluating hard-to-measure policy outcomes, supporting designing effective public policy and to track and measure policy impacts, using data science and AI to inform policy making also to develop the ethical foundations for the use of data science and AI in policy-making and contribute to policy that governs the use of data science and AI.291

291 Alan Turing Policy Institute., (2021). *Using data science and AI to inform policy making*, Retrieved from: https://www.turing.ac.uk/research/research-programmes/public-policy (Accessed 16 May 2021)

Fountaine, T., Mc Carthy, B., and Saleh, T. (2019) state in respect of AI use in organisations that siloed processes can inhibit the broad adoption of AI that organisations that assign budgets by function, or business unit may struggle to assemble interdisciplinary teams, also that as AI tools use spread throughout an organistion, those closest to the work are more able to make decisions once made by those above them, noting that this flattens organisational hierarchy and encourages collaboration, noting that AI can augment decision making, can create fundamental and sometimes difficult challenges in workflows, roles and cultures, that those who embrace AI implementation in their organisations, will find themselves at a greater advantage in a world where humans and machines working together outperform either humans or machines working on their own.292

### 2.8.2 AI, Robotics in Public Sector and Financial Data

The USA government (2020) RPA programme assessed 23 programs noting that preliminary results of the RPA automation deployed resulted in 848,336 annualized hours and that 49% of the RPA deployment cases were within Finance. Case studies of RPA included the Department of Agriculture Office of the Chief Information Officer, General Services Administration Office of the Chief Financial Officer, U.S. Department of Treasury (Bureau of the Fiscal Service).293

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292 Fountaine, Tim., Mc Carthy, Brian., Saleh, Tamim., (2019). *Building the AI Powered Organisation Technology isn't the biggest challenge culture is.* Pages 63-73. Harvard Business Review, July-August 2019, pp 62-73, Cambridge, Massachusetts, USA. Retrieved from: https://hbr.org/2019/07/building-the-ai-powered-organization (Accessed 16 May 2021)

293 Federal RPA Community of Practice (COP)., (2020). *The State of Federal RPA An Analysis of Governmentwide RPA Impact, Deployment and Best Practices* Version 1.0 November 01, 2020. USA: Eds: Geoghegan, James., Keene, Nathan., and Stegmaier,

An example of the benefit of AI and Robotics use, is the USA Government Interior Business Centre (IBC) (2020) reports that use of RPA in accounting operations is saving over 4,000 hours of manual work annually, allowing the IBC to provide more value-added services and analysis to customer agencies. They noted that eliminating this manual work means there is better customer support, better options for staff hiring, ability to attract new lines of business and new and existing customers, highlighting the benefits of competitive pricing achieved by automation. They stated because of their proven results, that they are looking at contracting with other federal agencies to develop RPA processes on their behalf. They state that as a shared service provider within the federal government, RPA can improve process efficiency while strengthening controls and adding more value to client organizations.294

Schallenberg, M (2021) highlighted the benefits of RPA beyond the pilot. He highlighted that RPA is used for multi-application, rules-based processes, such as invoice processing that RPA processing time is much faster, accurate, consistent, and reliable compared to manual process approaches, that bots work 24/7 without interruption, noting that Process Robotics can automate rules-based work without compromising underlying IT infrastructure. He noted bots are programmed to replicate repetitive human tasks using

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Andrew., Pages 8, 15-21 (case studies). Digital.gov online article. USA. Retrieved from https://digital.gov/pdf/state-of-federal-rpa.pdf (Accessed 15 May 2021)

294 USA Government., Department of the Interior, (2020). *Robotics Process Automation in Accounting Operations at the IBC* Website article published online by the USA Government Department of the Interior, https://ibc.doi.gov/FMD/Accounting-News [Link no longer works when I tried 15 May 2021. Hard copy version printed.]

recorders and easy programming language. He quantifies this in a process flow and in annual basis manual hours worked savings.295

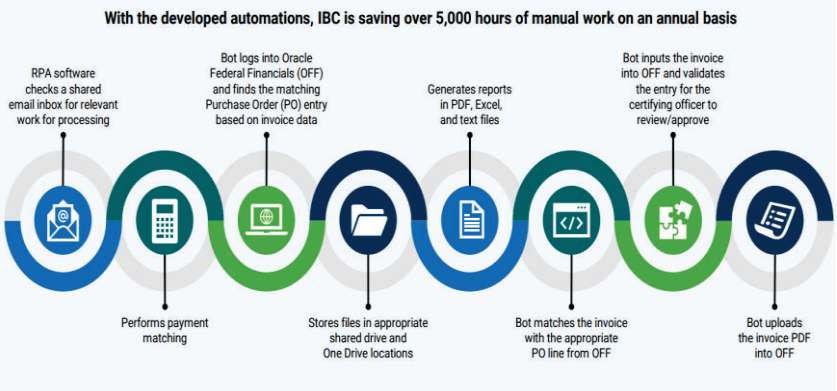


**Figure 2.35: RPA developed automations is saving over 5,000 hours of manual work annually, by USA, Government., Department of the Interior, Interior Business Centre (IBC)., (2021)**

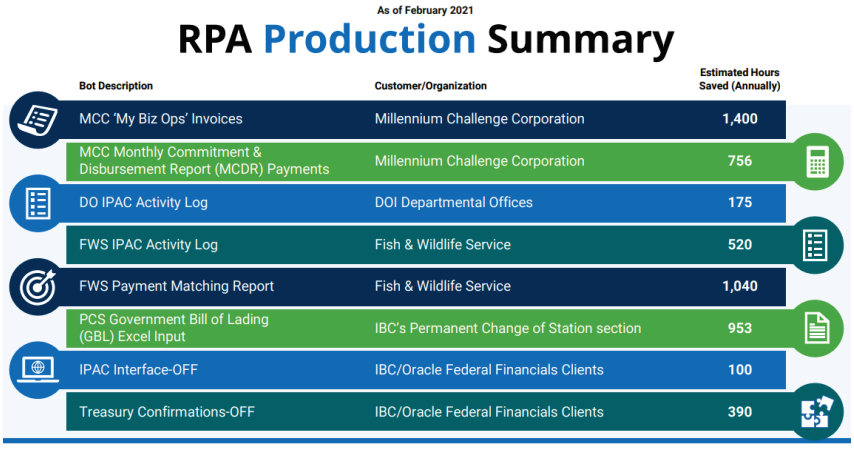


**Figure 2.36: RPA Production Summary, Bot Description, Customer/ Organization estimated Hours saved annually, by USA, Government., Department of the Interior, Interior Business Centre (IBC)., (2021)**

295 Schallenberg, M, USA, Government., Department of the Interior, Interior Business Centre (IBC)., (2021). Slides 21 -23. Schallenberg, M, Presented at the *Interior Business Centre, Customer Day.* April 08, 2021. Retrieved from: Robotics Automation Process (doi.gov) (Accessed 15 May 2021)

There is evidence from the above, that AI robotics and machine learning, automation of financial data, is resulting in increased efficiencies, and that as stated, that "RPA processing time is much faster, accurate, consistent, and reliable compared to manual process approaches" which would indicate that it results in better financial data.

### 2.8.2 AI, Blockchain in Public Sector and Financial Data

There is evidence of Blockchain use as noted earlier 'the U.S. Treasury Department and the National Science Foundation (NSF) developed a blockchain-enabled system to monitor payments and terms of grants, achieving this by using a blockchain-powered Letter of Credit (LC) to facilitate peer-to-peer fund transfers.'296

296 *Asia Blockchain Review., (2020).* Improving Grant Management with Blockchain Technology. *Paragraph 1. Asia Blockchain Review, Kuala Lumpur, Malaysia. Published 27 January 2020. Retrieved from:* Improving Grant Management with Blockchain Technology - Asia Blockchain Review - Gateway to Blockchain in Asia *(Accessed 15 May 2021)*

*Source of article originally* Rockwell, Mark., (2020). *Tracking Grants by Blockchain.* Paragraphs 1-5. GCN media. McLean. Virginia, USA. Retrieved from: Treasury Department finishing tests of a blockchain-based letter of credit capability for grant tracking -- GCN *(Accessed 14 May 2021)*

The OECD OPSI (2018) analyzed 203 government blockchain initiatives in 46 countries, being researched, at proof of concept, in development or live297, the data was sourced from the Illinois Blockchain Initiative 298299 at that time.

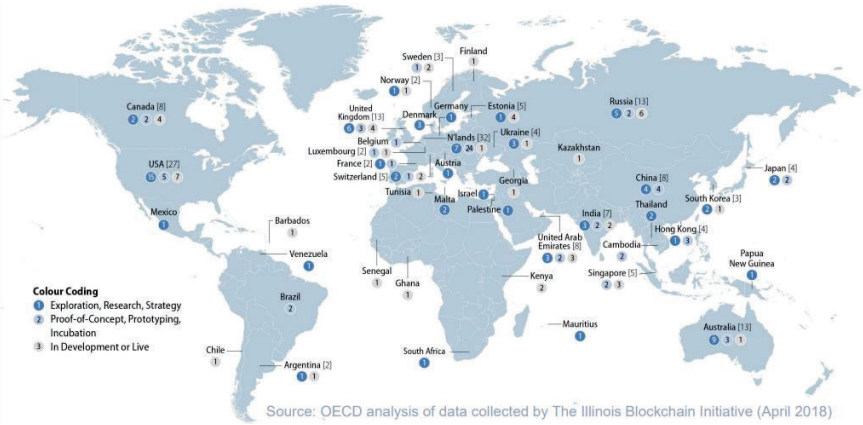


**Figure 2.37: Analysis of Government Blockchain Initiatives in 46 countries data collected by the Illinois Blockchain Initiative (April 2018) by the OECD (2018)**

They identified many potential use cases, including, land title registry, asset management, supply chain management, inventorying – tracking an asset from creation, transportation, purchase and inventory, benefits, entitlements and aid using smart contracts,

297 OECD, OPSI., (2018). *Uses and Limitations of Blockchain in the Public Sector.* Slide 5. OECD, OPSI, Paris, France. Slides presented at the Meeting of the OECD Global Parliamentary Network 10 October 2018 PowerPoint Presentation (oecd.org) (Accessed 15 May 2021)

298 Springfield Illinois, Department of Innovation and Technology, USA (Accessed 15 May 2021) Retrieved from: Blockchain in Illinois - Home

The website stated 'Blockchain and distributed ledger technology has the potential to transform the delivery of public and private services, redefine the relationship between government and the citizen in terms of data sharing, transparency and trust, and make a leading contribution to the State's digital transformation'.

299 The Illinois Blockchain Initiative (2021) *Blockchain in Government* Airtable - Blockchain in Government Tracker - Cards [204 cases were referenced on 17 April 2021] (Accessed again on 15 May 2021)

contract and vendor management, and streamlining interagency processes and also noted limitations including 'immutability' (an add-only list), also that the act of explaining blockchain to public officials and civil servants is difficult, but that de-linking blockchain from Bitcoin and discussing how it can improve efficiency and strengthen mission effectiveness can help.300

CPA (2019) highlight the Vienna smart city open data project, described as including data such as public transport routes, train schedules and surrounding communities' voting results, and that Ernst and Young (EY) previously assisted the city to use blockchain, to help facilitate transparency, efficiency, and security of the data, noting that EY OpsChain PFM helps governments drive transparency, provide accountable outcomes for citizens and track budgets, expenditures and results by using the blockchain to match government spending programs with tangible outcomes, even as funding may pass through multiple layers of government and public service agencies, governments around the world are modernizing their cities digitally, blockchain technology can positively impact processes also, from tax collection to open data to public spending.301

Allessie, D., Sobolewski, M., and Vaccari, L, (2019) highlight examples of blockchain use in the EU providing many case study examples including the Netherlands

300 OECD, OPSI., (2018). *Uses and Limitations of Blockchain in the Public Sector.* Slides 4, 5, 7. OECD, OPSI, Paris, France. Slides presented at the Meeting of the OECD Global Parliamentary Network 10 October 2018 PowerPoint Presentation (oecd.org) (Accessed 15 May 2021)

301 Chartered Public Accountants (CPA)., (2019). *EY launches blockchain solution for government accounting*. CPA Practice Advisor, California, USA. Retrieved from: EY Launches Blockchain Solution for Government Accounting | CPA Practice Advisor (Accessed 15 May 2021).

smart blockchain-based redistribution system of benefits for low-income citizens,, highlighting programmable money to target and allocate social benefits and grants; they also reference speculative use cases of blockchain technology use to counter Value-added-tax (VAT) fraud stating that this block-chain based collection of VAT effectively closes a large part of the VAT gap in Europe which they noted was estimated to be €147.1 billion annually, but they noted 3 technological challenges, the EU-wide scale of the system, volume of transactions, and backward correction of accounts as likely to preclude operational deployment of such a system in the near future.302

Europol (2021) reference many impacts of different financial crimes including quantification for example "Customs import fraud resulted in financial losses of at least EUR 5.5 billion to the EU budget between 2016 and 2019" that "VAT fraudsters continue to generate multi-billion-euro profits in the EU." They highlight that by creating economic imbalances and market distortion, and that the integrity of the national and international markets and financial systems are weakened by these criminal activities and that growth of underground economies is supported. They note technology and digital infrastructure is an essential component to commit VAT fraud for different purposes also that the precise scale of illicit finance generated through money laundering is difficult to assess due to serious intelligence gaps on criminal turnover and profits and highlight how corruption undermines society, noting that corruption is an integral element of almost every organised crime

302 Allessie, D., Sobolewski, M., Vaccari, L, (2019*). Blockchain for digital government*. Pages 5-6, 78-83. Allessie, D., Sobolewski, M. and Vaccari, L. Pignatelli, F. editor(s), EUR 29677 EN, Publications Office of the European Union, Luxembourg, ISBN 978-92-76-00582-7, doi:10.2760/93808, JRC115049. Retrieved from: *Blockchain for digital government* (Accessed 15 May 2021)

activity that it is used to gain influence and to infiltrate private and public sector organisations.303

Lyons, T., Courcelas, L., Timsit, K., (2018) reported for the European Union Blockchain Observatory & Forum noting that blockchain smart contracts could improve project oversight through use of escrow and could make procurement decisions more transparent, that automating payments would help governments with their own auditing, reporting and bookkeeping efforts as well. They put forward that blockchain-based systems could help governments get a better aggregate overview of their procurement processes and expenditures, for example by providing easy-to-access audit trails or making it easier for different agencies to share and aggregate data. They noted that such data could then be made available to politicians and citizens, providing a much fuller picture of how tax receipts are being used which, they state, in turn would give politicians and citizens better means to hold officials accountable for the wisdom and fairness of their spending decisions and they note that officials would probably also benefit from this data. 304

303 European Union, Europol., (2021). *EU serious and organised crime threat assessment (SOCTA) 2021.* Pages 62, 65. Europol, Publications Office of the European Union, Luxembourg. Retrieved from: https://www.europol.europa.eu/activities-services/main-reports/european-union-serious-and-organised-crime-threat-assessment (Accessed 15 May 2021)

304 Lyons, Tom., Courcelas, Ludovic., Timsit, Ken., European Union Blockchain Observatory & Forum., (2018). *Blockchain for Government and Public Services* Page 17. ConsenSys AG on behalf of the European Union Blockchain Observatory & Forum https://www.eublockchainforum.eu/sites/default/files/reports/eu_observatory_blockchain_in_government_services_v1_2018-12-07.pdf (Accessed 15 May 2021)

Berryhill, J., Bourgery, T., Hanson, A.., OECD (2018), reference a number of interesting case studies of blockchain use noting in one instance that the World Economic Forum had recommended that the Mexico government explore use of blockchain technology in government, following a citizen engagement initiative, the winning team developed a prototype of public tenders smart contracts, which allowed the public bidding to be reliable and as a result six smart contracts corresponding to each phase of Mexico's contracting processes were created, codifying the business rules. The blockchain procurement process also allowed ensuring that the winner of the tender process is the bidder that generates greater social benefit. 305

The OECD (2019) Policy Forum facilitates stakeholders to focus on policy implications of blockchain and other distributed technologies and discuss current ideas and upcoming issues with senior-level policymakers and industry experts and stated, blockchain promotes game-changing thinking and behavior related to the environment, noting that it could be a powerful tool for rewards programmes and for changing consumer behaviours relating to the choices they make, that it could enable government mobilise information for sustainability purposes such as datasets on biodiversity. They note that sustainability in blockchain can be highly dependent on energy sources used or where facilities are located and reference cryptocurrencies such as bitcoin, that, their energy footprint is a question which often comes up in discussions on blockchain noting that:

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305 Berryhill, Jamie., Bourgery, Théo., and Hanson, Angela., OECD., (2018). *Blockchains Unchained: Blockchain Technology and its use in the Public Sector.* Pages 44, 45. Berryhill, Jamie., Bourgery, Théo., and Hanson, Angela. OECD Paris, France. https://doi.org/10.1787/3c32c429-en. Retrieved from. https://www.oecd-ilibrary.org/governance/blockchains-unchained_3c32c429-en (Accessed 15 May 2021)

"Sustainability and blockchain is closely related to the consensus mechanism used. For example, proof-of-stake is a more energy efficient consensus mechanism than "mining" employed through the proof-of-work mechanism that is used for Bitcoin. Sustainability in blockchain can also be highly dependent on energy sources used, or where facilities are located.

They highlight that blockchain could bring opportunities to energy systems for renewable energy source certificates trading and verification, technological integration of smart technologies including, smart meters, smart grids, and local energy markets. 306

Clavin, J., Duan, S., Zhang, H, Janeju, V., Joshi, K., Yesha,Y., Erickson,L. and Li, J., (2020) outline case use examples of blockchain including for critical infrastructure in the energy sector and by government. They stated that most blockchain applications were financial at first, similar to many good and proven technologies but that blockchains are now being used in other spaces, such as government and outline challenges to adoption concluding that blockchain may be the best technology to deploy when a need to distribute data through a system that needs to guarantee data integrity and service availability exists, but the ability to make it happen is limited.307

The EU (2020) notes that ESBI can enhance transparency and trust in public services, simplify administrative processes and increase efficiency, increase data security

306 OECD., (2019). *The Policy Environment for Blockchain Innovation and Adoption: 2019 OECD Global Blockchain Policy Forum Summary Report.* Page 3, 28 OECD, Paris, France. Retrieved from: *https://www.oecd.org/finance/2019-OECD-Global-Blockchain-Policy-Forum-Summary-Report.pdf* (Accessed 15 May 2021)

307 Clavin, James., Duan, Sisi., Zhang, Haibin, Janeju, Vandana. P., Joshi, Karuna. P., Yesha, Yelena., …. Justin, D., (2020). *Blockchains for Government: Use Cases and Challenges.* Pages 11, 16. Digit. Gov.: Res. Pract., Vol. 1, No. 3, Article 22. DOI: **https://doi.org/10.1145/3427097 (**Accessed 15 May 2021)

and privacy, and ensure sustainability, offering enhanced seamless services to citizens and companies, in your own country and across the EU. Leverage, a government hosted blockchain network, a vibrant blockchain ecosystem, European Blockchain Services Infrastructure, (EBSI) what's in it for you? Functional Evaluation, Resource Evaluation, Cost Free Software, Blockchain Services Testing, Governance and Regulatory Support, Early access to EBSI and Community Access.308

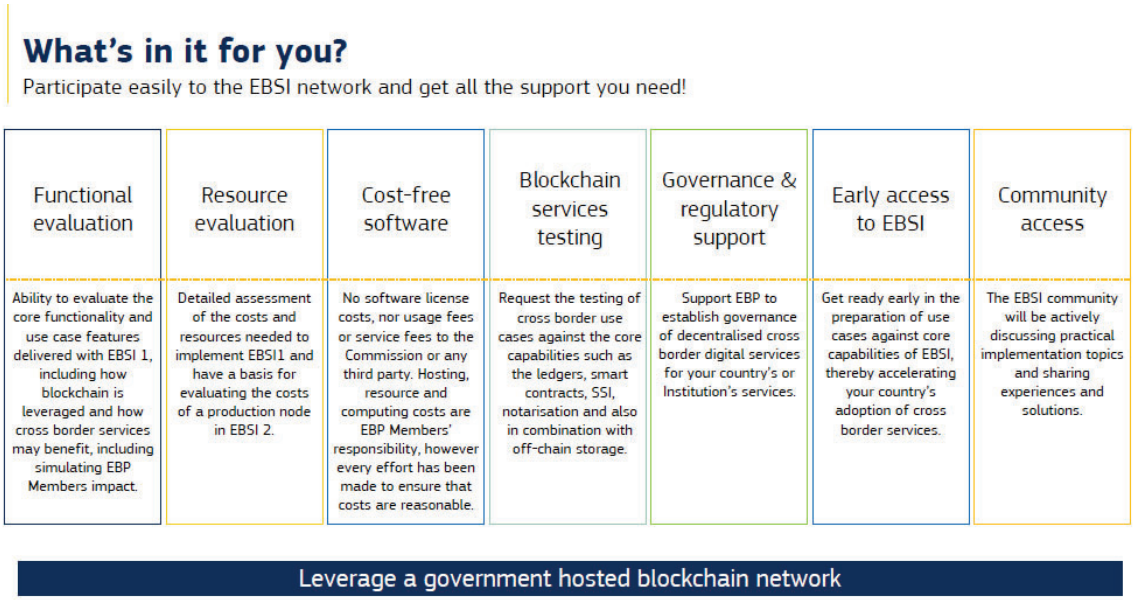


**Figure 2.38: EU, ESBI, Blockchain Services, what's in it for you? by the EU, ESBI (2020)**

The EU notes as part of its Blockchain strategy that it has in place a strong regulatory and policy framework supporting blockchain innovation, that Europe is home

308 EU, European, Commission, EBSI., (2020). *Meet the European Blockchain Services Infrastructure, harness the power of blockchain services, increasing trust through data security, privacy, and transparency.* Slides, 3, 16, 21, 26. EU, EBSI. Brussels. Belgium. Retrieved from: https://ec.europa.eu/cefdigital/wiki/display/CEFDIGITALEBSI/EBSI+Documentation+home (Accessed 15 May 2021) [*#Blockchain4Europe*]

to a vibrant blockchain startup ecosystem, with many startups in major cities including Paris, Amsterdam, Berlin and Madrid, among others, that there are also many blockchain initiatives in the public sector. Blockchain can help make interaction between citizens, enterprises and public organisations more efficient, reinforce trust and enable each party to retain control of their own data, that it will be instrumental in building a citizen-centric, sustainable, transparent and inclusive European digital society. They stated that by using blockchain themselves European policy makers gain first-hand knowledge of how the technology works, and that the European Blockchain Partnership (EBP) and the European Blockchain Services Infrastructure (EBSI) serve as a technological and regulatory sandbox, leading to better, more informed regulation on the technological and use case front.309

### 2.8.3 AI, Machine Learning Public Policy, Sustainability, Climate Change

The World Meteorological Organization (WMO) Taalas. P., (2019) noted the present and future significance of AI for the WMO community as a potential solution to computing and data handling challenges, demand for data usability and fast access by users and the ability of AI to meet the climate change challenge was noted.310

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309 EU, European Commission., (2021). *European Blockchain Strategy Brochure.* Webpage EU, European Commission. Brussels, Belgium. Retrieved from: https://digital-strategy.ec.europa.eu/en/library/european-blockchain-strategy-brochure (Accessed 15 May 2021 Website last updated 08 March 2021).

310 World Meteorological Organisation (WMO)., Taalas, Petteri., WMO Secretary General, (2019). *Artificial Intelligence for good*. Published 28 May 2019. WMO, Geneva, Switzerland. Retrieved from: https://public.wmo.int/en/media/news/artificial-intelligence-good (Accessed 16 May 2021)

Berryhill, J., Heang, K., K., Clogher, R., and McBride, K., OECD (2019) highlighted how crowdsourcing citizen views was further enabled through CitizenLab a technology to empower civil servants, provide them with machine-learning augmented processes that will help them, analyse citizen input, make better decisions, to collaborate more effectively internally. The platform uses Natural language Processing (NLP) and Machine Learning to classify and analyse citizen contributions. They noted this platform raised awareness of the growing number of Belgian Youth that were protesting, against Climate Change and in response the civil servants set up a participation platform seeking citizen ideas on tackling climate change, resulting in a report for elected officials containing 16 policy recommendations resulting from that engagement.311

O'Malley, N., (2021) reported on a landmark ruling in Australia 27 May 2021 where the court ruled that, politicians have a duty of care to protect children from climate harm, also to protect the environment. The case was taken by children of the 'School Strike for Climate' movement. They had argued that a million Australian children would be hospitalized at least once in their life for heat stress and that the Great Barrier Reef will die along with the east coast eucalyptus forests should climate change not be halted. The ruling finding of the politician duty of care, is advised a world first.312

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311 Berryhill, Jamie., Heang, Kévin Kok., Clogher, Rob., and McBride, Keegan., OECD., (2019). *Hello, World: Artificial Intelligence and its use in the public sector* Pages 141-143. OECD, Observatory of Public Sector Innovation (OPSI), Paris, France, Prepared by the Directorate for Public Governance under the leadership of Marcos Bonturi. Retrieved from AI-Report-Online.pdf (oecd-opsi.org) (Accessed 13 May 2021)

312 O'Malley, Nick (2021) *Politicians have a duty of care to protect children from climate harm.* Paragraphs 1-9. Nick, O'Malley, The Sydney Morning Herald, Sydney, Australia. Retrieved from: https://www.smh.com.au/environment/climate-

The National Aeronautics and Space Administration (NASA) (2021) reference space exploitation on robots noting that a robot can survive in space for many years and can be left out there, that some robots can withstand harsh conditions, extreme temperatures, or high levels of radiation, that some can be built to do things that would be too risky or impossible for astronauts. The reference their continuing work in this area including research on BRUIE the buoyant rover for under-ice exploration, a robot which can float in the water and roll its wheels along the underside of an icy surface, all while taking pictures and collecting data.313 Space junk is increasingly noted as a potential climate issue.

Luke, C. (2021) of Earth.org states that s*pace junk which poses a particularly catastrophic threat to humankind's future in space exploration, due to increased risk of collision with and damage to functioning satellite, noting that it could also have detrimental effects on Earth's environment. She states that ar*tificial, or orbital, space junk consists of objects ranging from paint flecks, from functioning space stations to those as large as decades-old, inoperative spacecraft.314

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change/politicians-have-duty-of-care-to-protect-children-from-climate-harm-court-finds-20210527-p57vqu.html

313 NASA (2021). *NASA Science Space Place, Explore Earth and Space.* Retrieved from: Why Do We Send Robots To Space? | NASA Space Place – NASA Science for Kids (Accessed 05 June 2021)

314 Luke, Charlotte. (2020) *What is space junk and what can we do about it.* Paragraphs 1, 2. Luke, Charlotte. Earth.org, Hong Kong. China. Retrieved from https://earth.org/space-junk-what-is-it-what-can-we-do-about-it/ (Accessed 05 June 2021)

Rao, A., Burgess, M. G., and Kaffine, D., (2020), economists, proposed a tax on orbiting satellites, noting that satellite operators are not accounting the costs they impose on other themselves or each other via collision risk. They noted the commercial satellite industry is rapidly expanding and that a side effect of this expansion is a growing buildup of space debris that imposes costly collision risk on satellite operators, that proposed solutions to this debris have been primarily technological, but the core of the problem is incentives. They propose an internationally harmonized orbital-use fee which they describe as 'similar' to carbon taxes and argue that the core of the space debris problem is incentives, not technology. With orbital-use fees, the long-run value of the satellite industry would increase from around $600 billion under the business-as-usual scenario to around $3 trillion. They reference that, economists to favor price-based policies for mitigating climate change. 315

Villazon, L., (2021) states that there is no direct effect, although astronomical observations are often degraded by space debris there is so much of it and that the main problem is that of collisions with operational spacecraft. He highlighted that with an average impact speed of 10km/s, any piece of debris larger than 1cm in diameter could cause a catastrophic impact, that the density of the junk may become so great, that it could

315 Rao, Akhil., Burgess, Matthew, G., Kaffine, Daniel., (2020). *Orbital-use fees could more than quadruple the value of the space industry.* Pages 12756, 12759. Proceedings of the National Academy of Scientists published May 26, 2020; https://doi.org/10.1073/pnas.1921260117 Edited by Catherine L. Kling, Cornell University, Ithaca, NY, and approved April 14, 2020. Retrieved from Orbital-use fees could more than quadruple the value of the space industry | PNAS

hinder our ability to use weather satellites, and hence to monitor weather changes caused by our own ground-based pollution.316

The European Space Agency (ESA) note in this regard that, as of 20 May 2021, the total mass of all space objects in Earth orbit was more than 9400 tonnes.317

The EU (2020) actions to support their headline goal of climate neutrality in Europe by 2050 states that 100 European cities will be supported and promoted in their transformation towards climate neutrality by 2030 through a climate city contact, new forms of participative governance, a new economic and funding model, integrated urban planning, digital technologies, and innovation management emphasizing both the participatory approaches and the multi-level governance collaboration that will trigger innovation and change towards climate neutrality.*318*

316 Villazon, Luis., (2021). *Does Debris around the earth affect the atmosphere?* Paragraphs 1, 2, 3. Villazon, Luis. Science Focus. Immediate Media Company, the BBC, London UK. Retrieved from https://www.sciencefocus.com/space/does-the-debris-around-earth-affect-the-atmosphere/ (Accessed 05 June 2021)

317 EU, The European Space Agency., (2021). *Space Debris by Numbers.* Retrieved from: https://www.esa.int/Safety_Security/Space_Debris/Space_debris_by_the_numbers (Accessed 05 June 2021).

318 EU, European Commission., Directorate General for Research and Innovation, Mission Board for Climate neutral and smart cities., (2020). *100 Climate Neutral Cities by 2030 - by and for the citizens* Pages, 5, 10. EU, European Commission., Belgium, Brussels. Retrieved from https://op.europa.eu/en/web/eu-law-and-publications/publication-detail/-/publication/82f1df57-b68b-11ea-bb7a-01aa75ed71a1 (Accessed 16 May 2021)

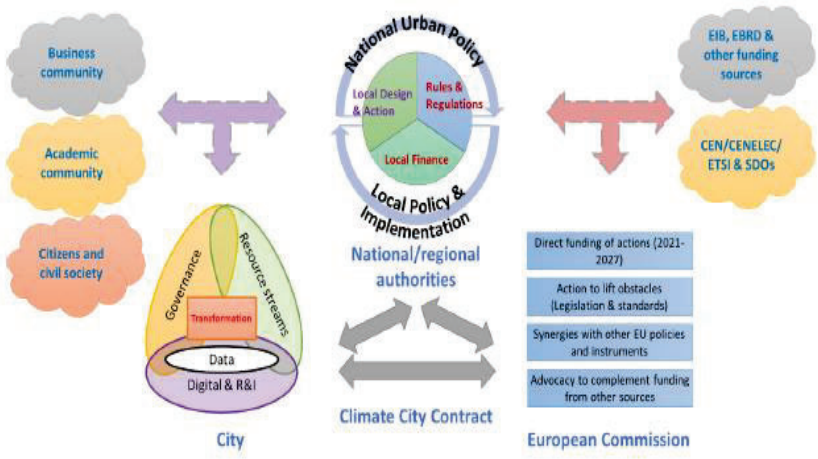


**Figure 2.39: 100 climate neutral cities by 2030 by and for the citizens by the European Commission (2020)**

Governments globally seek to mitigate climate change. In Ireland for example, there is a Climate strategy and action plan. In addition, climate costs must be included in policy development and appraisal. The Public Spending Code (PSC) provides advice and guidance, examples being calculating the shadow price of carbon319, and greenhouse gas emissions.

> "Each greenhouse gas has the potential to accelerate global warming at a different rate. To reflect this, greenhouse gas emissions should be converted to a common metric, Global Warming Potential (GWP), which is expressed in equivalent tonnes of carbon dioxide (tCO2e). This conversion is performed using the 100-year Direct Global Warming Potential (GWP) values from IPCC AR4, consistent with reporting under the United Nations Framework Convention on Climate Change (UNFCCC)". 320

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319 DPER., (2019). *Public Spending Code.* Pages 20-24. DPER, Dublin. Ireland. Retrieved from: *Central Technical References and Economic Parameters* (Accessed 16 May 2021)

320 DPER., (2019). *Public Spending Code.* Page 6 and footnote 1. DPER, Dublin, Ireland. Retrieved from: *Supplementary Guidance -Measuring & Valuing Changes in Greenhouse Gas Emissions in Economic Appraisal Ireland*, (Accessed 16 May 2021)

The PSC requires that these parameter values be used in economic policy appraisal and evaluations. But policy appraisal and financial data used, is not AI enabled.

### 2.8.4 Ireland, even better Public Policy the case for AI, Robotics Process Automation and Machine Learning in Exchequer Funds Financial Appraisal

"Money matters - always." the European Commission Inter-service group on Public Administration Quality and Innovation (2017 updated 2021) stated 'measures to support small and medium enterprises (SMEs), train the unemployed, or build infrastructure can only be done with money, with better collaboration among institutional entities, optimisation of functions, and changing attitudes towards a stronger service ethos might require more of a change in thinking and culture, than much money and that optimising public administration processes might "actually save a lot of money". 321

All policy development, implementation and review stated in Ireland are underpinned by financial data, estimates, budgets, exchequer funds, future costs must be examined at every stage from consideration of a policy, through delivery, at completion and at pre-determined times, post implementation, as part of a lessons learned report. The basis of the financial, economic and exchequer funds flow data is set out clearly. In

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Footnote 1: The conversion factors incorporate GWP values for a 100-year time horizon relevant to reporting under UNFCCC, as published by the IPCC in its Fourth Assessment Report. Although the IPCC have prepared a newer version since, the methods have not yet been officially accepted for use under the UNFCCC. As this is the basis upon which all emissions are calculated by the EPA, the Greenhouse Gas Conversion Factors used within the Public Spending Code are consistent with this.

321 European Union, European Commission., Inter-service group on Public Administration Quality and Innovation., (2017, last updated 2021). Page 220. EU, European Commission, Belgium, Brussels. Retrieved from: Quality of Public Administration "Toolbox" Abridged version (Accessed 16 May 2021)

addition, social good, environmental, climate and carbon costs information are provided for the policy section in support of robust appraisal at all stages. Stewardship of public funds underpins public financial management as outlined in Public Financial Procedures, Circulars, EU law and the Public Spending Code.

The Government publicly reports through the Government Financial Statistical Reporting Manual (GFSM) on financial statistics also through Eurostat, and the Central Statistics Office in Ireland and budget data is published online under the Open Data initiative, and example of this is the government open data portal, Whereyourmoneygoes' 'a graphical, easy-to-use tool where users can drill into the various sectors that make up government expenditure. It includes dedicated summaries, interactive charts, and graphs for the main categories of expenditure. 322

DPER and Department of Finance (2021) noted that for the citizen and other users, this resource together with statistical data can be used in many ways, from citizen information, research, using commercially by the private sector. 323

Project Ireland 2040 is a €116 billion budget and plan (called the National Development Plan)324 to guide Ireland's development over the next years setting

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322 DPER, Office of the Government Chief Information Officer (OGCIO)., Open Data Unit, Open Data Portal (Website has no date. Accessed 16 May 2021) *Where your money goes showcase website.* DPER, Dublin, Ireland, Retrieved from: https://data.gov.ie/showcase/where-your-money-goes-website

323 DPER, OGCIO and Department of Finance., (2021). *Where your money goes.* DPER, OGCIO, and Department of Finance, both, Dublin, Ireland. Retrieved from: https://whereyourmoneygoes.gov.ie/en/ (Accessed 16 May 2021)

324 DPER, (2020). *National Development Plan 2018-2027.* DPER, Dublin, Ireland, Retrieved from: ( gov.ie - National Development Plan 2018 - 2027 (www.gov.ie) (Accessed 16 May 2021. Last updated on 26 November 2020)

priorities, reinforcing values, and providing for significant population growth. This long-term predictive estimate of expenditure is not on the government data portal is it published in another location. Capital projects and programmes with a project value of €20m, are tracked on an excel sheet and progress reported in annual reports and site updates.325 The user interface dashboard, generates summary charts and tables.326

Ernst & Young (EY)., (2021) was engaged by the Structural Reform Support Service of the European Commission on behalf of the DPER, to review the Irish Government's capital project and programme delivery capability and referenced the fragmented nature of delivery of the major capital investment projects.

> "The responsibility for the delivery of Capital Programmes rests with a range of public Entities, such as Government departments, local authorities, state agencies, devolved agencies, semi-state companies and approved independent bodies. This fragmented delivery approach has resulted in varying degrees of maturity across the State in relation to each Entity's capability."

The report highlighted skills gaps in commercial and financial management also procurement, from a survey conducted with 94 entities and interviews with senior staff in 13 public bodies. The report noted that consultees communicated several tools and technologies that were being utilised to support Capital Programme Delivery, but that a

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325 Government of Ireland., (2021). *Project Ireland 2040* Government of Ireland, Dublin, Ireland. Retrieved from: *https://www.gov.ie/en/campaigns/09022006-project-ireland-2040/?referrer=http://www.gov.ie/2040/* (Accessed 16 May 2021, Last updated 14 May 2021).

326 Government of Ireland (2021) *Project Ireland 2040* Government of Ireland, Dublin, Ireland. Retrieved from: https://www.gov.ie/en/publication/6db7c4-investment-projects-and-programmes-tracker/ (Accessed 16 May 2021, Website last updated December 2020)

consistent application was not identified during the consultation process. The report stated that 51% of respondents to the questionnaire, responded that use of digital systems and technology was limited/very limited and 52% of respondents stated that there were no plans to upskill staff to assist with implementing this in the future. Good examples of digital systems and technology use were identified, and the report references Transport Infrastructure Ireland (TII) and Department of Housing, Local Government and Heritage (DHLGH) but the report highlights there was not a systemic use of digital systems, technology or digitisation of programme information across the Entities.327

Jiles, L., (2020) of the Institute of Management Accountants, (IMA) Association of Accountants and Financial Professionals in Business notes that the historical nature of finance and accounting function's role dictates that many of its processes are repetitive and rules-based, and that these are two of the most important criteria in identifying good RPA candidates.328

Irish Government Economic and Evaluation Service (IGEES), (2021) state the "Public Spending Code (PSC) is the set of rules and procedures that apply to ensure that these standards are upheld across the Irish public service", also that "all Irish public bodies

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327 Ernst & Young, (E.Y.), and DPER (2021). *Supporting Excellence: Capital Project and Programme Delivery Capability Review Ireland,* Pages 7, 40, 41. DPER, © 2021 Ernst & Young (EY), Dublin, Ireland. Retrieved from: https://www.gov.ie/en/collection/580a9d-project-2040-documents/#project-ireland-2040-documents (Accessed 16 May 2021)

328 Jiles, Loreal., of Institute of Management Accountants (IMA)., (2020). *Transforming the Finance Function with RPA* Page 4. Jiles, Loreal, IMA, Montvale, New Jersey, USA. Retrieved from: https://www.imanet.org/-/media/8530486050e34be392772caa088f1162.ashx (Accessed 16 May 2021)

are obliged to treat public funds with care, and, to ensure that the best possible value-for-money is obtained whenever public money is being spent or invested." 329

The PSC applies to all levels of public expenditure, both capital and current and has a series of guidance depending upon your requirements, decision-gates governed in a clear framework from staff developing policy to government and/or DPER approval where thresholds indicate (€100m for capital expenditure, Government and DPER, €20m for current DPER and €25k for ICT expenditure DPER OGCIO Digital Government Oversight Unit (DGOU)).330 Financial and other appraisal is done manually at present.

TII (2021) guidance on financial appraisal outline three types of financial appraisal, general financial analysis (project cash flow analysis), exchequer cash flow analysis and sources of funding analysis, in sectoral guidance for the PSC, noting that the appraisal period should match the economic life of the asset to take into account its whole-life cost, that the appraisal period for financial appraisal of large road and light rail schemes is usually sixty years, plus the time it takes to deliver the project.

329 Government of Ireland, DPER, Irish Government Economic and Evaluation Service, (IGEES)., (2021). *Public Spending Code* Government of Ireland, IGEES, Dublin, Ireland. Retrieved from: *https://igees.gov.ie/public-spending-code/* (Accessed 16 May 2021)

330 DPER. (2019). *Public Spending Code.* Dublin, Ireland. Retrieved from: *Public Spending Code* all guidance at this website. Website last updated 16 April 2021.

| Example General Financial Analysis[7] | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Description/Years (t) | Total (€ Thousand) | Construction Phase | | Operational Life | | | | | |
| | | | 1 | 2 | 3 | 4 | 5 | … | … | 32 |
| a | Tolling Revenue | 60,000 | 0 | 0 | 2,000 | 2,000 | 2,000 | … | … | 2,000 |
| b | Residual (e.g. from the sale of land) | 20,000 | 0 | 0 | 0 | 0 | 0 | … | … | 20,000 |
| c | Total Inflows (a+b) | 80,000 | 0 | 0 | 2,000 | 2,000 | 2,000 | … | … | 22,000 |
| d | Main Construction Contract | 30,000 | 15,000 | 15,000 | 0 | 0 | 0 | … | … | 0 |
| e | Main Supervision Contract | 6,000 | 3,000 | 3,000 | 0 | 0 | 0 | … | … | 0 |
| f | Archaeology | 100 | 100 | 0 | 0 | 0 | 0 | | | 0 |
| g | Advance Works and Other Contracts | 300 | 300 | 0 | 0 | 0 | 0 | … | … | 0 |
| h | Land and Property | 3,000 | 3,000 | 0 | 0 | 0 | 0 | … | … | 0 |
| i | Planning and Design | 500 | 500 | 0 | 0 | 0 | 0 | … | … | 0 |
| j | Initial Construction Outflows (d:i) | 39,900 | 21,900 | 18,000 | 0 | 0 | 0 | … | … | 0 |
| k | Ongoing Maintenance Costs | 9,150 | 0 | 150 | 300 | 300 | 300 | … | … | 300 |
| l | Labour Costs | 3,050 | 0 | 50 | 100 | 100 | 100 | … | … | 100 |
| m | Ongoing Operational Outflows (k+l) | 12,200 | 0 | 200 | 400 | 400 | 400 | … | … | 400 |
| n | Total Outflows (j+m) | 52,100 | 21,900 | 18,200 | 400 | 400 | 400 | | | 400 |
| o | Operational Revenue (c-m) | 67,800 | 0 | -200 | 1,600 | 1,600 | 1,600 | … | … | 21,600 |
| p | Nominal Cash Flow (c-n) | 27,900 | -21,900 | -18,200 | 1,600 | 1,600 | 1,600 | … | … | 21,600 |
| q | FNPV (p/s) | -6,604 | -21,058 | -16,827 | 1,422 | 1,368 | 1,315 | … | … | 6,157 |
| r | FRR (IRR(p)) | 3% | | | | | | | | |
| s | Discount Factor (1+4%)$^t$ | N/A | 1.04 | 1.08 | 1.12 | 1.17 | 1.22 | … | … | 3.51 |

**Table 2.10: Ireland, Public Spending Code, Example General Financial Analysis by the Standards and Research Section, TII (2021)**

TII (2021) also provide examples of Financial Inflows and Outflows for Exchequer Cash Flow Analysis which builds on the Financial Net Present Value, with minor adjustments to include additional direct and indirect inflows and outflows associated with the project which solely impact the exchequer budget. They note other flows as relevant should be included citing examples of Shadow Tolling, Public Private Partnerships (PPP) Availability Payments, EU finance passing through exchequer (co-funding) and fines and not that they may be classified as inflows or outflows depending on the flow of funds to/from the exchequer.

| Variable | Description |
|---|---|
| *Inflows* | |
| *Indirect Dividends* | Direct dividends are considered operating revenues e.g. tolling. Indirect dividends also increase as a result of the project going ahead. Examples of indirect dividends include:<br>• VAT[11],<br>• Excise Duty[12];<br>• Carbon Tax[13];<br>• Corporation Tax;<br>• Income Tax;<br>• VRT; and<br>• Avoided Unemployment Costs (social welfare benefit).<br><br>Inclusions must be net of deadweight and must only include what would not have been received in the absence of the project. |
| *Outflows* | |
| *N/A* | N/A |

**Table 2.11: Ireland, Public Spending Code, Examples of Financial Inflows and Outflows for Exchequer Cash Flow Analysis additional to General Financial Analysis Inflows and Outflows), by the Standards and Research Section, TII (2021)**

TII also outline a Source of Funding analysis, which confirms the role played by participants in the funding process, noting that it should be carried out if funds are sought from more than one source for a project. 331

331 Transport Infrastructure Ireland, (TII)., (2021). *Project Appraisal Guidelines for National Roads Unit 11 – Financial Appraisal.* Pages 8, 9, 11, 12. TII, Dublin, Ireland. Retrieved from: https://www.tiipublications.ie/library/PE-PAG-02010-02.pdf (Accessed 16 May 2021)

| | Year 0 | Year 1 | Year 15 | Year 30 | Ref | Notes |
|---|---|---|---|---|---|---|
| Calculation of Total Funding | | | | | | |
| EU finance passing through the Exchequer | 30 | - | - | - | [a] | Scheme Detail |
| Exchequer contribution | 40 | - | - | - | [b] | Scheme Detail |
| EIB financing | 20 | - | - | - | [c] | Scheme Detail |
| Other | 10 | - | - | - | [d] | Scheme Detail |
| Total Funding | 100 | - | - | - | [e] | a + b + c + d |

**Table 2.12: Ireland, Public Spending Code, Example General Sources of Funding Analysis, by the Standards and Research Section, TII (2021)**

As noted in the DPER/EY report and referred to earlier the responsibility for the delivery of Capital Programmes rests with a range of public Entities, such as Government departments, local authorities, state agencies, devolved agencies, semi-state companies and approved independent bodies."332

#### 2.8.4.1.1 Ireland PSC State Aid in PSC and Financial Appraisal

All expenditure proposals, capital or current, must incorporate consideration of state aid rules and the annual quality assurance processes, under capital expenditure being considered the question is asked 'Were State Aid rules checked for all supports.'333

332 E.Y.., (2021). *Supporting Excellence: Capital Project and Programme Delivery Capability Review Ireland*. Page 7. DPER, © 2021 Ernst & Young (EY), Dublin, Ireland. Retrieved from: https://www.gov.ie/en/collection/580a9d-project-2040-documents/#project-ireland-2040-documents (Accessed 16 May 2021)

333 DPER. (October 2018). *Public Spending Code, Consolidated Document Checklist.* Pages 33, 42. DPER, Dublin, Ireland. Retrieved from: *Public Spending Code Consolidated Document Checklist* (Accessed 16 May 2021)

Heimler, A., (2009) considers the European Union and economic integration noting that the treaty is far sighted, that it goes much further than merely imposing a free trade regime, guaranteeing within the Union, four fundamental freedoms, the free movement of goods, services, labor, and capital, introducing antitrust provisions and that it impedes anticompetitive subsidies. He notes the most controversial decision on State Aid are those related to the aid for rescue and restructuring of firms in difficulty. He also noted the European Union is the first jurisdiction in the world that has introduced an active policy against State Aid. 334 State Aid takes many forms, it can be state grants, or subsidies, guarantees, preferential loans, and other. Should State Aid form part of PSC financial appraisal?

Heimler, A., (2009) also commented on the role of economic analysis in the assessment of state aid that the counterfactual in state aid is the absence of state aid and the analysis is meant to show that state aid overcomes a market failure. He notes that once a policy has been chosen through competition impact assessment it will be subject to ex-post evaluation and the results of same can feed into ex-ante appraisal335.

How much more useful, timely, and accurate, could financial data be if AI enabled and provided in real time, with predictive budgeting based on machine learning from

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334 Heimler, Alberto., (2009). *European State Aid Policy, in Search of a Standard – What is the Role of Economic Analysis?* Pages, 1, 2, 31. SSRN, New York, USA. October 22, 2009). Retrieved from: SSRN: https://ssrn.com/abstract=1492585 or http://dx.doi.org/10.2139/ssrn.1492585 (Accessed 16 May 2021)

335 Heimler, Alberto., (2009). *State aid control and competition impact assessment.* Slides 2, 3, 7. Slides presented, SSPA, Rome, 2009: Retrieved from: State aid control and competition impact assessment (europa.eu) (Accessed 16 May 2021)

financial datasets, including EU funding? Could blockchain and robotics with machine learning, AI technologies help? All policy initiatives are subject to appraisal as part of the Public Spending Code policy appraisal in Ireland, the code quantifies climate, and sustainable development costs as part of the Exchequer funds flow and financial appraisal processes. The PSC appraisal is rules-based and repetitive, making it an ideal candidate for RPA. Discussion on use of RPA for financial appraisal processes including exchequer cash flow, commenced with DPER RPA team and national investment office (NIO) in March 2021, as part of this doctorate and this contact confirmed the business relevance of the topic and financial appraisal RPA solutions recommended in doctorate, will be provided to DPER.

### 2.8.5 The importance of citizen engagement in public policy

Mehr, A., (2020) noted AI has the potential to have a great impact on the way citizens experience and interact with their government.336 This includes public policy and in addition to researching AI, RPA, Machine Learning for Financial Appraisal, policy modelling and citizen engagement is key to the public policy processes and the role of AI augmented citizen engagement and citizen views on their role in Public Policy will be explored as part of this research. Concern has been expressed about the need for inclusiveness and reaching some citizen cohorts for example Andersen et. Al. (2020) discussion on digital sclerosis, the decreased bargaining and discretion power of

336 Mehr, Aila., (2017) *Artificial Intelligence for Citizen Services and Government.* Page 15. Aila, Mehr, Harvard Kennedy School, Ash Centre for Democratic Government and Innovation. Cambridge, Massachusetts, U.S.A. Retrieved from: https://ash.harvard.edu/files/ash/files/artificial_intelligence_for_citizen_services.pdf (Accessed 30 May 2021)

governmental workers, enhanced agility, and ability at shifting and extended proximities, and panopticonization notes that to respond proactively and take preventive care initiatives, policy makers and systems developers need to be sensitized about the digital sclerosis, to prepare the technology, also to design intelligent augmentations in a flexible and agile approach and, recommends that the future research agenda on e-government might incorporate this idea of digital sclerosis and engage with operational practices and citizens in responding to these challenges. 337 The UN (2014) *Measurement and Evaluation Tool for Citizen Engagement and e-Participation (METEP) questionnaire tool assesses citizen engagement and e-participation and the UN METEP website* states:

> "Engaging citizens is beneficial to governments throughout the public policy process: i) at the early stages to enhance public problem definition and to identify acceptable policy options; ii) through the implementation stages by facilitating dialogue to support policy inclusiveness and iii) to receive feedback while monitoring and evaluating public policy programmes and their outcomes, which is key to continuous improvements in the delivery of public goods and services."

The United Nations Department of Economic and Social Affairs (UNDESA) stated on their website that they developed this self-assessment questionnaire in response to an emerging need for stronger and deeper participation in citizen engagement by all stakeholders, that this was identified in the Rio+20 Summit Report, Realizing the Future We Want for All, and in the work of the UN Task Team on the Post-2015 Development Agenda. 338

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337 Andersen, Kim. Noorman, Lee, Jungwoo., and Henriksen, Heller. Zinner. (2020). *Digital Sclerosis? Wind of Change for Government and the Employees.* Pages, 1, 2. *Digit. Gov.: Res. Pract.*, *1*(1), 1–14. https://doi.org/10.1145/3360000 (Accessed 30 May 2021)

338 UN., Department of Economic Affairs and Public Institutions, (2014). *Measurement and Evaluation Tool for Citizen Engagement and e-Participation* Website.

Below is a summary of how citizen voice can be heard in policy making today. How much stronger if AI enabled voices are also heard.

**Figure 2.40: Public Policy Ireland, Your Voice, Presented at Chartered Accountants Ireland Dublin Business Network Group on 28 May 2021 by Marita Gonsalves (author's own) (2021)**

Felipel, L., Reves, U., Andersen, D. F., Black, L. J., and Pardp, T, A. (2021) report findings from a case analysis using participatory approaches in system dynamics, based on a digital government project integrating information systems of New York's criminal justice agencies. They emphasize how important visuals are in the sensemaking process

UN Department of Economic and Social Affairs, Public Institutions. Retrieved from https://publicadministration.un.org/en/Capacity-Building/Tools/METEP (Accessed 23 February 2022)

that results from the interaction of technical and social outcomes produced through identifying and continuously re-interpreting main project issues and goals. They highlight the lenses of people-centered project management processes, and that sensemaking is an emerging approach in project management, that it underscores the role of social processes in technical projects. 339

The Institute of Policy Studies, Lee Yew School of Public Policy, National University of Singapore (2014) commissioned SenseMaker® software to consult with Singapore citizens' asking the question, 'how will we govern ourselves in 2022? Respondents were asked to tell a story of what their lives might be like a decade from now. They were also asked to outline what 'good governance' looked like, how government should play its role and their views on the value of the vote'. Their responses included 'we are a self-centered society now, but I want to be in a people-centered Singapore in the future.340 By 2021, Soon, C., Liang, S. J., Singapore Institute of Policy Studies (2021) highlighted Singapore was engaging with the citizen in many different ways including through the citizen's panel, that as Singapore increasingly sees citizens as partners of the government, that a paradigm shift is required across the entire public sector. The citizens'

339 Felipel, Luis., Reves, Una., Andersen, David. F., Black, Laura. J., and Pardp, Theresa, A. (2021) *Sensemaking and Social processes in Government digital projects.* Retrieved from: https://www.sciencedirect.com/science/article/abs/pii/S0740624X2100006X (Accessed 23 May 2021)

340 The Institute of Policy Studies, Lee Yew School of Public Policy, National University of Singapore. (2011). *IPS Prism Governance in 2022*. Cognitive Edge Pte, Ltd., UK Retrieved from: Use Cases - SenseMaker® (cognitive-edge.com) [Now in hardcopy only. Originally on Cognitive Edge (2021). SenseMaker® for Government. https://sensemaker.cognitive-edge.com/sensemaker-for-government/ Retrieved from: (Accessed 23 May 2021)

panel is a tool for public engagement and government-citizen partnership poses a significant change not just to citizens, but to the public sector as well, that there is no one way to engage the public that policymakers now have a range of tools including public opinion surveys, focus group discussions, citizen advisory committees emphasizing the role of citizens in policy deliberation, co-creation and also in co-implementation of policy recommendations, stating: "Today, with rising educational attainment, overseas exposure through work and travel, and a growing sense of identity and belonging that Singaporeans, young and old, are prepared to step forward to contribute and make a difference." 341

Kin, Yeong, See., Infocomm Media Development Authority of Singapore., (IMDA) and the Singapore's Personal Data Protection Commission (PDPC) (2021) report through the OECD AI policy observatory on how the Singapore government is developing a culture of AI innovation, by encouraging younger citizens to engage with technologies, citing an example, the IMDA 'Lab on Wheels' programme.

> "The IMDA Lab on Wheels programme introduces AI and other emerging technologies by bringing technology-interactive showcases to schools and the community. For example, the AI-themed bus takes on an "escape room" challenge concept to help demystify and showcase different AI technologies such as image recognition and natural language processing. This enables the exploration of technologies in ways that are fun and engaging for students.
> The Lab on Wheels also engages self-help groups and special education schools such as the Chinese Development Assistance Council and the Movement for the Intellectually Disabled of Singapore through customised workshops and activities.342

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341 Soon, Carol., Liang, Sim Jui., Singapore Institute of Policy Studies (2021). *Citizen engagement in Singapore Applications of the Citizen Panel.* Page 5. Citizen Engagement in Singapore: Applications of the Citizens' Panel - LKYSPP Event (nus.edu.sg) Retrieved from: (Accessed 23 May 2021)

342 Kin, Yeong, See., Infocomm Media Development Authority of Singapore., and Singapore's Personal Data Protection Commission (PDPC)., (2021) *Singapore the Future of Work in the age of AI.* OECD, Paris, France. Retrieved from: The OECD Artificial

Van Neerven, S., and Overwey, R., (2021) highlight in the context of organizational relevancy that "people with an adaptable mindset are continuous learners and have proven to be more resilient, happier, more creative and more productive and that innovation plays a fundamental role in helping organisations stay relevant, and it will continue to dominate the future of our economy"343

The importance of ongoing citizen engagement in public policy and the opportunities for AI enabled citizen engagement, continue to develop. In their survey of 217 public sector staff, Govloop and Genesys (2018) noted AI use in the public sector was still at a relatively low point at that time and "many survey respondents had not even heard of AI" but also where the respondents were interested in AI's potential they appeared to understand its ability and potential for enhancing the citizen experience and they concluded that a major takeaway for artificial intelligence in government was that, "today is a budding moment for education around this technology, and what it could truly do to help agencies with their citizen experience and needs." 344

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Intelligence Policy Observatory - OECD.AI article at Singapore: The future of work in the age of AI - OECD.AI (Accessed 22 May 2021)

343 Van Neerven, Simone., and Overwey, Robert., (2021) *An adaptable mindset is a prerequisite for innovation.* Quote on website, Van Neerven, Simone., Overwey, Robert, SSBR, Switzerland Retrieved from: https://www.ssbr-edu.ch/ssbr-online-session-an-adaptable-mindset-makes-you-innovate-successfully/ (Accessed 23 May 2021)

344 GovLoop., and Genesys., (2018) *Potential for Artificial Intelligence in Government Citizen Engagement..* Page 3. Govloop and Genesys. Washington, USA. Retrieved from: https://go.govloop.com/rs/231-DWB-776/images/Potential-of-AI-in-gov-CX.pdf?mkt_tok=eyJpIjoiT0dZMk9XUmxaVFl3TURVMSIsInQiOiJBa1VlVGYzNVVhMUxZQk1CRW5VV2U1cEJ2RVhkclBndFBnc0NjRTdZczFJWUxJbG8zUVwvNzJHM1N3Q3VndWhNVkVUaE1UUXArWStTNSsrT000bHZScG5oWVk2d3NrVzdvS3BlUF

The Harvard Berkman Klein Center (2019) explored novel challenges posed by AI, and highlighted five key areas of ongoing impact in relation to public dialogue about information quality and online propaganda; use of algorithms in the criminal justice system; supported development of inclusive AI governance frameworks both in the USA and on a global scale; engaged industry in developing socially beneficial paths for AI technology and developed new approaches to teaching students and the public about the social implications of AI technology.345

A summary of the various means by which AI enabled financial data, Autonomous AI, the Public Policy Cycle and the RIA cycle (part of public policy) are interlinked and underpinned by ethics, is set out in the diagram below.

FRaGxuc2I1S0VNTDRwZnBNcE5Hckw2Vkl1ckEifQ%3D%3D (Accessed 23 May 2021).

345 Harvard Berkman Klein Centre, (11 October 2019) Ethics and Governance of AI at Berkman Klein: Report on Impact, 2017-2019

https://cyber.harvard.edu/story/2019-10/ethics-and-governance-ai-berkman-klein-report-impact-2017-2019

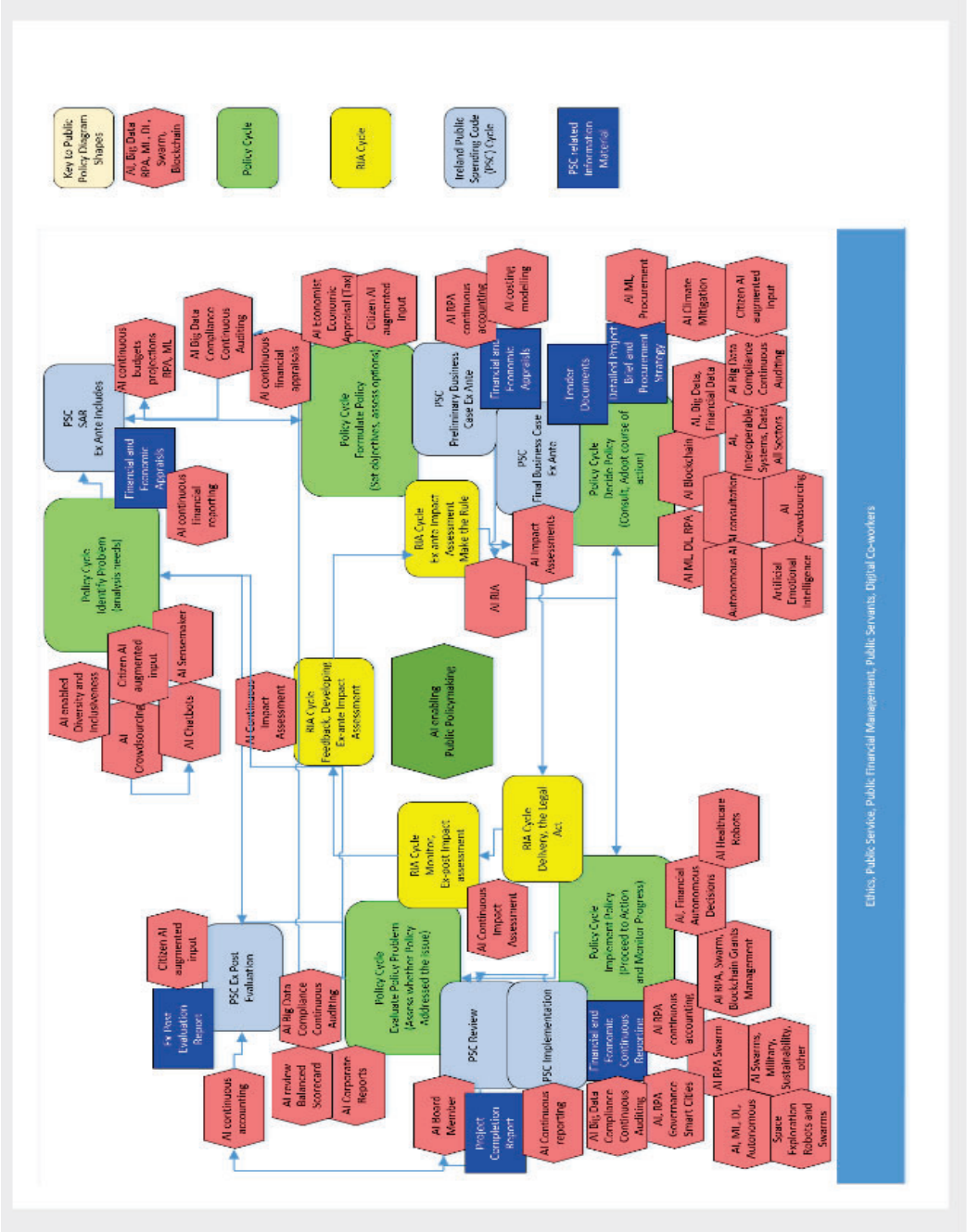


**Figure 2.41 Literature Review evidence of Public Policy, AI enabled financial data, AI ML, RPA, Blockchain, Robot Swarms, all are interlinked By Marita Gonsalves (author's own, unpublished) (2021)**

## 2.9 AI, robotics and machine learning automation of financial data and better public policy, conclusion

'Money matters – always.' As noted by the (European Union, European Commission Inter-service group on Public Administration Quality and Innovation., 2017 last updated 2021) 346 So does citizen voice ((Andersen, K., et al., (2020), (Berryhill, J., et al., OECD, 2019), (GovLoop and Genesys 2018), (Mehr, A., 2017), (UN 2014)).

AI ethical considerations for financial data and public policy are not clearly highlighted in existing literature. There is great work being done in development and in implementation of AI in government, including algorithmic government, but ethics considerations are not clearly specified, and it is not clear how AI use impacts on Public Policy governance, ( (Alan Turing Institute 2021), (European Space Agency, 2021), (Villazon, L., 2021), (Kin, YS., Infocomm Media Development Authority Singapore and Personal Data Protection Commission Singapore, 2021), (European Commission, 2020), (Luke, C., 2020), (Misuarca, G., & van Noordt, C., 2020), (Rao, A., Burgess, M., & Kaffine, D., 2020), (Fountaine, T., McCarthy, B., & Saleh, T., 2019), (Harvard Berkman Klein Centre 2019) ), although, blockchain ( (USA, Illinois Department of Innovation and Technology, 2021), (European Commission, 2021), (McClean, M,, 2020), (Clavin, J., 2020), (EU EBSI, 2020), (Chartered Public Accountants, 2019), (Allessie, D., Sobolewski, m., & Vaccari, L., 2019), (OECD Public Policy Forum, 2019), (OECD, OPSI 2018), (Lyons, T., Courcelas, L., Timsit, K., EU Blockchain Observatory and Forum 2018)

346 European Union, European Commission Inter-service group on Public Administration Quality and Innovation., (2017 last updated 2021). *Quality of Public Administration Toolbox.* Page 220. EU, European Commission, Brussels, Belgium. Retrieved from: Quality of Public Administration "Toolbox" . (Accessed 14 May 2021).

(Berryhill et al., OECD, 2018) ), robotics ( (USA, Schallenberg, M., Department of the Interior 2021), (USA Government, Department of the Interior 2020), (Federal RPA Community of Practice USA 2020), (Jiles, L., of IMA., 2020) ),and other AI and associated technologies ( (NASA, 2021), (Berryhill, J., et al., OECD (2019), (WMO, Taalas, P., 2019)) are in use already in public policy including autonomous AI, (Griffin, M., 2018) and Parliamentary office (Parliament of Victoria, Australia, 2018), although it is noted that, governance framework for same needs improvement. ((Shafran, M., et al., 2020), (Springorum, S.,, Srikanth, M., & Goran, Vranic., 2019) ). An AI-augmented citizens' voice in public policy needs to be heard.

This literature review, set out in 6 key questions, demonstrates there is a relationship between AI ethics in data analytics, AI systems, GDPR, and governance and public sector policy. The relationship is unclear in terms of ethics public policy and financial data. AI, Machine Learning, Robotics, and Blockchain, although used in public sector appear to need enhanced financial ethics governance frameworks.

The relationship with financial ethics governance needs to be explored particularly in relation to IFAC ethics and AI. Citizen voice is key to public policy and to financial management scrutiny and will relate to my work exploring this relationship. Financial appraisal RPA solutions and AI Economist, for the Public Spending Code will be considered as part of this doctorate.

The initial picture of "Artificially Intelligent Public Policymaking" figure 2.42 will be expanded using both the findings of the literature review and interpretation of the primary data collected and a new Algorithmic Governance model will be developed/adapted incorporating Ethics and AI Financials.

To conclude: “This is an exciting time, a new Chapter in our history.”347

347 Picture quotes, Barth, John., (2020) Retrieved from http://www.picturequotes.com/this-is-an-exciting-time-a-new-chapter-in-our-history-quote-525713

# CHAPTER 3

# ON THE DANCEFLOOR AND THE BALCONY

**"No pessimist, ever discovered the secret of the stars, or sailed to an uncharted land, or opened a new doorway for the human spirit"-348**

## 3.1 Introduction

The purpose of this research is to evaluate the relationship between an AI governance framework for financials, data and Public Policy. This research explores the hypothesis that a strong AI governance framework will result in more timely, accurate information and better Public Policy. A specific focus is on ethical considerations for AI, financials, data, and policymaking. The Research Question is: "How does an AI governance framework benefit Public Policy"?

This research seeks to evaluate the relationship of AI governance with development of Public Policy and use the findings to develop a Code of AI Governance for Public Sector with a specific focus on AI governance, financials and data, and policymaking. The Research will as sub-questions consider the following in the context of AI governance, ethics, financials, machine learning, and data analytics.

## 3.2 Research Philosophy

Saunders, M., Lewis, P., and Thornhill, A., (2019) state that research philosophies refer to the systems of beliefs, and assumptions, about the development of

348 Helen Keller Quotes (n.d.)., Brainy Quote.com Retrieved June 7, 2021, from BrainyQuote.com Web site: https://www.brainyquote.com/quotes/helen_keller_161286 (Accessed 07 June 2021)

knowledge349, citing Johnson, P., and Clarke, M., (2006) who state awareness of the philosophical commitments we make through our choice of research strategy is important because this awareness has a significant impact on what we do and on how we understand what we are investigating350. The Department of Housing, Local Government and Heritage is responsible for Franchise policy a process underpinning the functioning of democracy.

The Vincentian Partnership for Social Justice., (2021) state every adult resident in Ireland is entitled to be registered, but citizenship, determines the elections at which a person may vote.351 Some Irish residents can vote if overseas, for example Defence Forces.352 You must register to vote. A person registers or does not register or a registered voter, votes, or does not vote for a multitude of reasons, and understanding those reasons, with a view to improving voter engagement, is achieved through citizen engagement and use of financial and other statistical data, developing public policy.

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349 Saunders, Mark. N. K., Lewis, Philip., Thornhill, Adrian., (2019). *Research Methods for Business Students* Eighth Edition UK Pearson Page 131 cite Johnson, P., and Clark. M., (2006). 'Editors Introduction: Mapping the terrain: An overview of business and management research methodologies', in P. Johnson and M. Clark (eds) *Business and Management Research Methodologies.* London: Sage, pp xxv-iv.

350 Saunders, Mark. N. K., Lewis, Philip., Thornhill, Adrian., (2019). *Research Methods for Business Students* Eighth Edition UK Pearson Page144-145

351 The Vincentian Partnership for Social Justice., (2021). *Right to Vote.* Dublin, Ireland. Website available at https://www.vote.ie/register/citizenship.html (Accessed 07 June 2021)

352 Ireland, Department of Foreign Affairs., (2021). *Voting in Elections and at Referendums.* Retrieved from: https://www.dfa.ie/global-irish/support-overseas/voting-in-referendums/ (Accessed 07 June 2021)

Saunders, M., et al, (2019) outline five major research philosophical positions, Positivism, Critical Realism, Interpretivism, Postmodernism and Pragmatism and suggest using the Heightening Awareness of Research Philosophy (HARP) tool Bristow and Saunders353 (2014), set out in Saunders, M., et al, (2019) to help researchers exploration of their research philosophy and reflection on whether the researchers' views are similar to and different from those of the five major philosophical traditions354. My HARP assessment below, which is based on my responses to the assessment questions, indicates I am closely aligned with two of the philosophical traditions, Pragmatism and Interpretivism.

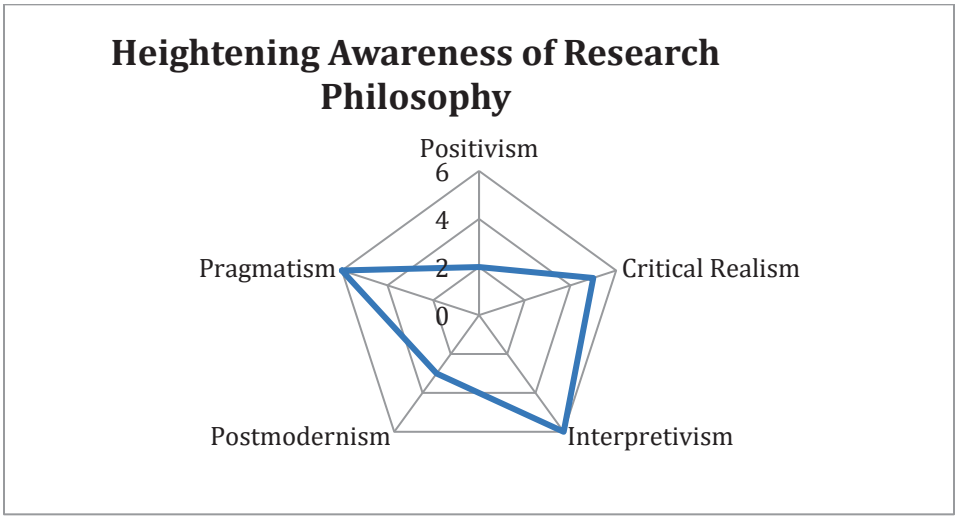


**Figure 3.1: Marita Gonsalves Heightening Awareness of Research Philosophy assessment by Gonsalves, M., (author) (2021)**

353 Saunders, Mark. N. K., Lewis, Philip., Thornhill, Adrian., (2019). *Research Methods for Business Students* Eighth Edition UK Pearson Page 57

354 Saunders, Mark. N. K., Lewis, Philip., Thornhill, Adrian., (2019). *Research Methods for Business Students* Eighth Edition UK Pearson Pages 161-164

The absence of emphasis on positivism, although this philosophy is often associated with quantitative research methods, is explainable, because researchers' values and beliefs must be excluded from research, as a Positivist, which is difficult as a public servant given public service values. No matter how empirical any dataset, be it statistical, financial or other, everything involves assumptions and judgements. Dowd, K., (2004) notes that at a fundamental level all research is ultimately qualitative by being dependent upon judgements and that good quantitative research requires good judgement and an awareness of qualitative issues. He highlights "even the most arcane quantitative research always hinges on qualitative judgements of some sort even if those judgements are poor ones' which he notes is 'bad enough' or 'made unconsciously by default', which he states that "from a methodological point of view is worse". 355

Positivists argue that things that cannot be measured have no meaning for the purposes of research. They seek to remain value-free in part because of the measurable, quantifiable data that they collect.356 I disagree with this view expressed in the HARP assessment, as the positivist view on what constitutes meaningful data, for the purpose of this research into AI financials and data and public policy development, because the values

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355 Dowd, Kevin., (2004). The Real-Life Guide to Accounting Research A behind the scenes view of using qualitative research methods. Chapter 30 Qualitative Dimensions in Finance and Risk Management Research. pp 509-524 Pages 509-510 Edited by Humphrey, Christopher., Lee, Bill., Elsevier Ltd. Amsterdam, Netherlands, Retrieved from https://www.elsevier.com/books/the-real-life-guide-to-accounting-research/humphrey/978-0-08-043972-3 Copyright @2004. ISBN: 0-08-043972-1.Update versions are at https://www.elsevier.com/books/the-real-life-guide-to-accounting-research/humphrey/978-0-08-043972-3

356 Saunders, Mark. N. K., Lewis, Philip., Thornhill, Adrian., (2019). *Research Methods for Business Students* Eighth Edition UK Pearson Pages 146,163

of serving ones' nation, community, planet357 altruistically cannot be measured, nor can good judgement. Engle, N., and Hallengatte, S., (2018) reference growing pressure on the World Bank to design an approach to systematically measure resilience benefits in the context of measuring development and poverty reduction that this is a measurement increasingly growing in importance but can be difficult to properly quantify and that the limitations of the indicators and monitoring systems needs to be clearly communicated and accounted for in the decision-making process. They stated 'like with any (unconscious) bias, being aware of the bias created by quantified indicators is a critical first step to managing this risk, preventing imperfect indicators from leading to bad choices, that what cannot be measured still must be managed.358

My researcher values are important in this research on AI governance and policymaking impact. As a Chartered Accountant, I am bound by a Code of Ethics, based on an international code adopted and implemented by more than 3 million professional accountants globally, who are committed to protecting long-term value for organisations and society and who act in the public interest. Sustainability matters, our core value is 'for

357 Information Note by Marita:

For example. The Ocean Foundation (2021) *World Ocean Day is June 08.* Retrieved from https://worldoceanday.org/ (accessed 07 June 2021)

358 Engle, Nate., and Hallengatte, Stephane., (2018). *What cannot be measured still must be managed.* Pages 1, 2, 3, 12. Engle, Nate., and Hallengatte, Stephane., Published by the World Bank, Washington D.C. U.S.A. Retrieved from http://documents1.worldbank.org/curated/en/211841526474954836/pdf/126265-WP-PUBLIC-P155632-What-cannot-be-measured-still-must-be-managed-final.pdf

A footnote states, contributions, edits, and comments from Marianne Fay, Benoit Lefevre, Julie Rozenberg, and Sundus Siddiqi, May 2018.

tomorrow, for good'359 Chartered Accountants Ireland (2020) and this informs my philosophical position on each of the questions below.

### 3.2.1 What is the nature of reality? (Ontology)

Interpretivists consider that humans are different from physical phenomena because they create meanings, have different cultural backgrounds, experience different circumstances, make different meanings. Developing public policy is complex and is informed by multiple perspectives, government, business, citizen input, and statistical and financial data. Saunders, M., et al (2019) note the ontology of Interpretivism is rich, socially constructed through culture and language, has multiple meanings, interpretations, realities, flux of processes, experiences and practices, that it is complex, as is the ontology of Pragmatism, which is also rich, and holds that external reality is the practical consequence of ideas, flux of processes, experiences and practices360. AI code is written by people and is informed by their world view. This research is pragmatic in ontological terms it acknowledges the close alignment with an Interpretivist stance in the need for diversity of thought and worldviews to develop better AI and modes of governance of same.

### 3.2.2 What is considered acceptable knowledge? (Epistemology)

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359 Chartered Accountants Ireland (CAI)., (2020). *Sustainability for Accountants.* Page 7. Chartered Accountants Ireland, Dublin and Belfast Offices, Ireland. Retrieved from: Sustainability for accountants (charteredaccountants.ie)

360 Saunders, Mark. N. K., Lewis, Philip., Thornhill, Adrian., (2019) *Research Methods for Business Students* Eighth Edition UK Pearson Pages 145,149,161

Saunders, M., et al (2019) note a pragmatist considers theories, concepts, ideas, hypotheses and research findings in terms of the roles they play as instruments of thought and action, and that the research problem the researcher is trying to address, and the research question are the most important determinants of the research design and strategy and that the research question would place emphasis on practical outcomes361. This research is pragmatic in epistemological terms and as a pragmatist acknowledges that it is perfectly possible to work with different types of knowledge and methods. This is important when considering the multiple realities behind governance of AI, with AI, and financials and data.

### 3.2.3 What is the role of values? (Axiology)

Saunders, M., et al (2019) note that interpretivists recognize that their interpretation of research materials and data, thus their own values and beliefs play an important role in the research process, and adopt an empathic stance, value-bound research, that pragmatists' research is value driven, aims to contribute practical solutions that inform future practice, that the researcher values drive the reflexive process of inquiry, and that there are many different ways of interpreting the world and undertaking research362. MacCarthaigh, M., (2008) states that concern with values, standards and ethics in public life is not new and that public service values and ethics have a close but distinctive relationship in policy

361 Saunders, Mark. N.K., Lewis, Philip., Thornhill, Adrian., (2019) *Research Methods for Business Students* Eighth Edition UK Pearson Page 151

362 Saunders, Mark. N. K., Lewis, Philip., Thornhill, Adrian., (2019) *Research Methods for Business Students* Eighth Edition UK Pearson Pages 145,149

making.363 The research values are pragmatic in axiological terms and places emphasis on ethics in governance of AI financials and data in policy making.

I'd completed a Myers Briggs assessment of character strengths part of the Coaching programme for Principal Officers in my Department. My signature strengths included 'Curiosity'. A useful strength when undertaking research.

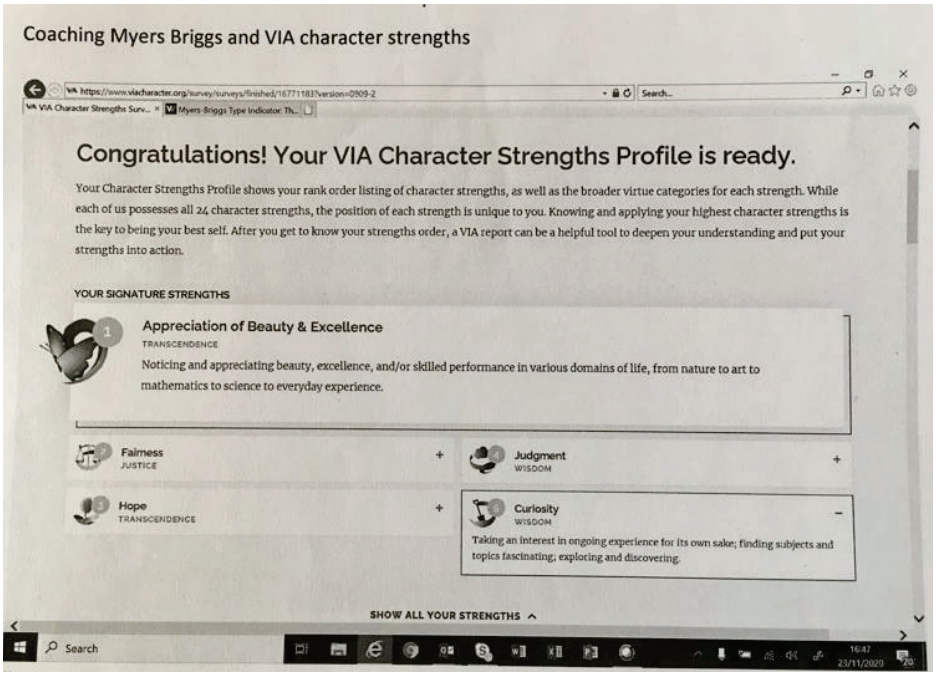


**Figure 3.2: Marita Gonsalves Myers Briggs VIA Character Strengths, Signature strengths included Curiosity, Fairness, Hope and Judgement, Profile done as part of the department Principal Officer Coaching Program when Acting Principal Officer, (2020)**

363 Mac Cartaigh, Muiris., (2008). *Public Service Values* Page 5 Ireland Published by the Institute of Public Administration, (IPA) Dublin, Discussion paper 39 IPA Committee for Public Management Research.

### 3.3 Research Design, Theory Development and Methodological Approach

Saunders, M., et al (2019) outline that research is designed to fulfill an exploratory, descriptive or explanatory purpose, or some combination of these, noting that exploratory studies ask open questions about an issue, problem or phenomenon, commencing with a broad focus becoming narrower as the research progresses, that the purpose of descriptive research is to gain an accurate profile of events, persons or situations, that this research design is often used as a precursor to explanation becoming descripto-explanatory, that explanatory studies seek to establish causal relationships between variables, to study a problem or situation to explain the relationship between variables, also noting that multiple methods in research design facilitates combining design approaches364. This research is closely aligned with descripto-explanatory.

Saunders, M., et al (2019) research onion outlines three approaches to theory development, deductive, inductive and abductive365 and Wheeldon, J., and Åhlberg, M. K., (2012) indicate that deductive reasoning is associated with quantitative research, uses a top-down process that tests a general premise through a series of steps to reach a specific conclusion, striving for generalizable findings, that some quantitative approaches miss the depth and detail that are assigned to phenomena by participants themselves and note that inductive reasoning is associated with qualitative research and develops general conclusions based on exploring how individuals experience and perceive the works around

364 Saunders, Mark. N. T., Lewis, Philip., Thornhill, Adrian., (2019) *Research Methods for Business Students* Eighth Edition UK Pearson Pages 186-188

365 Saunders, Mark. N. T., Lewis, Philip., Thornhill, Adrian., (2019) *Research Methods for Business Students* Eighth Edition UK Pearson Pages 152-158

them, focusing on development of theories based on an interpretative or individualistic process which can't be generalized: and that the abductive process, is a more pragmatic approach that is associated with mixed-methods research, that both qualitative and quantitative methods are valuable, and values the expertise, experience and intuition of researchers themselves and in relation to maps, they state:

> "Maps may be especially valuable from a pragmatist's point of view because visualising and imagining connections and relationships can be creative, distinctive, thus productive in ways other kinds of data collection may not be. 366

Sahay, A., (2016) notes that the philosophy of pragmatism considers that no single viewpoint can ever give the entire picture and that the pragmatist researcher uses a variety of data collection techniques and analysis procedures then discusses mixed method of research and use of various approaches to triangulation, also that what is ethical is of utmost importance.367

Plano-Clark, V., et al (2008) identify four major mixed methods designs, highlighting that mixed method researchers used triangulation designs directly compare quantitative and qualitative forms of evidence to corroborate results or identify

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366 Wheeldon, Johannes., Åhlberg, Mauri, K., (2012). *Visualising social science research: maps methods and meanings* in *Mapping mixed-methods research: theories, models, and measures.* Pages, 115, 118. Wheeldon, J., Åhlberg, M, K., SAGE Publications Inc. USA, UK, Europe, (pp. 113-148). Retrieved from: *Mapping mixed-methods research: theories, models and measures.* In *Visualising social science research: maps methods & meaning.*

367 Sahay, Arunaditya., (2016). *Peeling Saunders's Research Onion* Pages 3,5. ResearchGate, Sahay, Arunaditya, Birla Institute of Management Technology, Jharkhand, India, Retrieved from: (PDF) Peeling Saunders's Research Onion (researchgate.net) (Accessed 31 May 2021)

discrepancies between data sources, or, to use one form of evidence to expand on the results of the other368.

The research process is abductive and methodological approach is pragmatic applying mixed methods. It encompasses both individual and organizational experiences both academic and business perspectives.

An understanding of how public policy is developed highlights the benefit of mixed-methodologies as it shows both the quantitative elements and qualitative elements. Anderson, J. E., (2003), defines a policy as 'a relatively stable, purposive course of action followed by an actor or set of actors in dealing with a problem or matter of concern', and sets out five steps to policymaking 'Problem identification and agenda setting: Formulation: Adoption: Implementation and Evaluation369. This is set out in government documents, also in stakeholder documents, for example, the "Think-tank for Action on Social Change" (TASC) toolkit to Open Government Guide to Policymaking, (2016) identifies five stages of the policy cycle, identification, discussion, decision, implementation and monitoring, expanding to identify stakeholders and processes at different stages, citizens, civil society, experts, interest groups, elected representatives, public consultation, parliamentary

368 Plano-Clark, Vicki., Huddleston-Casas., Churchill, Susan., O.Neil, Green, Denise., Garrett, Amanda., (2008). *Mixed Methods Approaches in Family Science Research.* Pages 1550-1551. Plano-Clark et al., Educational Psychology, Department of Educational Psychology Papers and Publications University of Nebraska Lincoln US. Sagepub.com. Retrieved from: Mixed Methods Approaches in Family Science Research - Vicki L. Plano Clark, Catherine A. Huddleston-Casas, Susan L. Churchill, Denise O'Neil Green, Amanda L. Garrett, 2008 (sagepub.com)

369 Anderson, J. E., (2003) *Public policymaking: An introduction.* USA, Boston: Houghton Mifflin Company, pp. 1 – 34. Pages 2,19,20

hearings, officials and front-line workers and their roles, also noting that statistics and public spending data are sources of information on policy on a particular topic370.

Basanta, Thapa., (2019) highlights some benefits and challenges of predictive analytics and AI in Governance, data-driven government in a free society for both policy making and in public administration benefits including, better informed policy making with predictive analytics, and with policy simulation, challenges including autonomy of citizens and of civil servants, also algorithmic accountability, and privacy371.

Throughout the policy cycle, Ireland's public sector governance framework, including its' financial governance structures, ethics and guidance documents, Public Financial Procedures372, the Public Spending Code373 underpin decision-making, at every policy stage providing baseline data financial indicators, financial appraisal, expenditure monitoring, procurement, value-for money policy reviews, post project reviews and much more. Can AI robotics and machine learning for financial data improve

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370 Think-tank for Action on Social Change (TASC) (2016) *Guide to Policy-Making* Page 6, Retrieved from https://www.tasc.ie/opengovtoolkit/ website @2021

371 Thapa, Basanta. E.P., (2019) *Predictive Analytics and AI in Governance: Data-driven government in a free society* Co-funded by the European Liberal Forum and the European Parliament and Printed by Printpool. Editor Feirabend, Dieter.,

372 Ireland, DPER, (2019). *Public Financial Procedures Government Accounting website.* Retrieved from: *https://govacc.per.gov.ie/public-financial-procedures-booklet-by-section* (Accessed 13 May 2021)

373 Ireland, DPER (2019) *Public Spending Code* Dublin, Ireland. Retrieved from: *Public Spending Code* all guidance at this website. Website last updated 16 April 2021.

timeliness and accuracy of financial data in policymaking? Do existing corporate governance ethics frameworks need to change to incorporate AI ethical considerations? The European Commission (2019) states AI brings new challenges because it enables machines to "learn' and to take and implement decisions without human intervention emphasizing the need for ethics guidelines for developers, suppliers and users of AI374.

Engin, Zeynep., and Trelaven, P., (2018) consider the role of robo-advisory supports for civil servants and identify many roles for Algorithmic government including public policy making, outlining their vision in a technology stack, that using new technologies in public sector introduces philosophical discussions including the changing public perception of privacy, security, ownership of and exploitation of personal data, referencing open government. They reference Robo-advisors using big data, predictive analytics also behavioral analytics in public policy development.375

374 European Union, European Commission (2019) *Building Trust in Human-Centric Artificial Intelligence* Belgium, Brussels, 8.4.2019 COM(2019) 168 Final, EN, Pages 1,2

375 Engin, Zeynep., Treleaven, Philip., (2018) *Algorithmic Government :Automating Public Services and Supporting Civil Servants in using Data Science Technologies* UK Department of Computer Science, University College London The Computer Journal, Volume 62, Issue 3, March 2019, Pages 448–460, Pages 449,451, 457

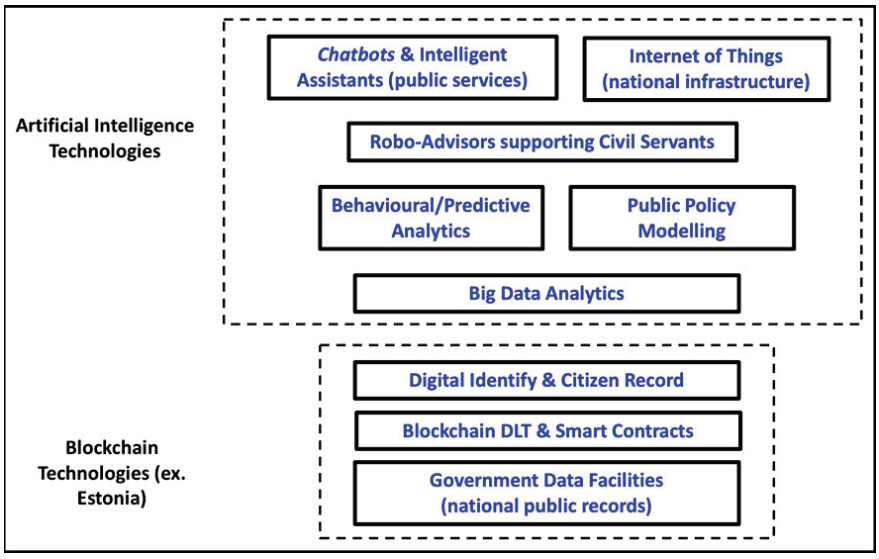


**Figure 3.3: Algorithmic Government Technology Stack by Engin, Zeynep., Treleaven, Philip., (2018)**

Ethics is fundamental to human, autonomous also non autonomous AI decision making processes but is missing from this algorithmic government technology stack. As part of this doctoral research this figure will be adapted to incorporate same, or a new model developed.

Sherman, F., (2019) states that the role of ethics in financial management is to balance, protect and to preserve stakeholders' interests, highlighting there are obligations to management, fellow employees, business partners, the public, and shareholders; and noting typical standards include, acting with honesty and integrity, avoiding conflicts of interest in professional relationships and the appearance of such conflicts, that having ethics in finance means doing the right thing, stating this is even in situations that are not covered in ethics codes, and notes that underlying the role of ethics in financial management is a fiduciary duty. He states another role of ethics in financial management is to guard your and your employer's reputation, that if you act ethically that you are in the

clear but if you cross the lines, you can destroy your company's good name as well as your own.376

The European Court of Auditors., (2019) states that ethical conduct in public affairs means that civil servants and public office holders should serve the public interest, manage public resources properly, and make fair decisions. It contributes to sounder financial management and increased public trust, which is indispensable if public policies are to succeed. Their report concluded that, to a large extent, the audited institutions had established adequate ethical frameworks with room for improvement, but they also found that in the Council there is no common ethical framework governing the work of the representatives of Member States, and that there were areas where the ethical frameworks would benefit from cross-institutional harmonization, citing as examples, 'outside activities for staff, and declarations on Members' spouses and partners' activities', and also noting the need to reference, examples of good practices.377

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376 Sharman, Fraser., (2019). *Business Ethics for a Finance Manager*. Paragraphs 1, 2, 3, 4, 8. Sharman, Fraser, Houston Chronicle.com, Houston, Dallas, USA. , November 05 2019. Retrieved from: https://smallbusiness.chron.com/business-ethics-finance-manager-20490.html (Accessed 06 June 2021)

377 European Union, European Court of Auditors (ECA)., (2019). *The ethical frameworks of the audited EU institutions: scope for improvement. Special Report No. 13.* Pages 4, 5. EU, ECA, Luxembourg. Retrieved from: https://www.eca.europa.eu/Lists/ECADocuments/SR19_13/SR_ethical_frameworks_EN.pdf (Accessed 07 June 2021)

Note: This performance audit was carried out by Audit Chamber V Financing and administration of the EU, headed by ECA Member Lazaros S. Lazarou. The audit was led by ECA Member Mihails Kozlovs supported by Edite Dzalbe, Head of Private Office and Laura Graudina, Private Office Attaché; Alberto Gasperoni, Principal Manager; Gediminas Macys, Head of Task; Michal Machowski, Deputy Head of Task; Aino Nyholm, Elisa Paladini24, Christian Geoffroy and Angela Onno, Auditors. Richard Moore provided linguistic support. Emanuele Fossati provided IT support.

I thought to gather examples of good practice applying the canvas model approach. The European Commission "Service Offering Canvas Toolkit" for example, is a "visual tool to help service providers plan value propositions for important digital themes," "making its user, the digital agency actively think about what it does, why, and for whom." Mapping services and stakeholders onto the Canvas, means "the user is channeled into a service mindset that ensures that stakeholders needs are appropriately anticipated and met." The European Commission state "when used on a continuous basis" it "enables digital agencies to identify what they should start doing or stop doing as stakeholders come and go and political focuses shift" also helping "to structure dialogue, and facilitate discussion, when validating value propositions and priorities", which is noted as "instrumental in closing the gap between political intent and their execution in real-life." And that this "one-page template" "is easy to adapt when needs change".[378]

Bell, S., (1996 then e-book 2005), research asks if "a flexible, eclectic systems analysis and design tool such as Multiview is an appropriate planning and development methodology for introducing information systems into developing countries."

> "Developing countries are currently receiving large numbers of computer systems as part of aid from major aid agencies. The systems are often completely unplanned and yet they are provided in high-risk environments and are expected to produce high-value returns. Existing methodologies which could be (and in some cases are) used in systems planning are expensive in personnel costs, and many focus on technical issues whilst often ignoring the critical social and political contexts which ultimately determine systems sustainability."

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[378] European Commission, (2021) V1.0 Service Offering Canvas Toolkit available at https://ec.europa.eu/cefdigital/wiki/display/CEFDIGITAL/Service+Offering+Canvas+Playbook (accessed 05 January 2022) [Connecting Europe Facility CEF]

The research highlights the "delicate interplay between analyst, context and methodology" noting that "the choice of application of methodology is largely dependent upon the perceptions of the various actors and the needs of the context" which " in turn feeds back into the specification of the methodological requirements for the context—soft or hard, and the approach of the analyst— interpretative or functionalist",

Also, that, "methodology needs to perform a difficult balancing act. It has to be capable of providing rigour and discipline, in potentially chaotic situations. On the other hand, it has to be able to adapt to changes in environment (both physical and social), technology and the predisposition of the analyst/researcher". The research states, "The model provided for pre-project analysis (Multiview) is not intended to be perceived as final or definitive" that "it was applied in an evolutionary manner in the fieldwork" that "other criteria might be applied to it," "replacing consideration of risk and uncertainty" with "level of sophistication of technology" which is noted, would result in "a different range of action plans", that "the fundamental issue is that analysis and design should reflect the wider concerns which impact upon the analyst, methodology and context, and that these concerns can then be reflected in the evolution, development and subsequent use of methodology. Lessons learned are noted that "the research methodology needs to be: (1) "eclectic, offering a range of tools; (2) participatively applied; (3) orientated towards the practitioner, (4) contextually specific and to be adaptable." [379] The learnings informed my Action Research approach.

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[379] Bell, Simon., (1996, then e-book 2005) *Learning with Information Systems, Learning Cycles in Information Systems Routledge Research in Information Systems* Published by Bell, Simon., Taylor & Francis e-Library, (2005)Available at https://www.goodreads.com/book/show/19899946-learning-with-information-systems [ Published February 1st 2013 by Routledge (first published May 23rd 1996)] ISBN 0-203-

### 3.3.1 Let's Talk Action Research

Saunders, M., et al (2019), highlight that the purpose of Action Research is "to promote organizational learning to produce practical outcomes through identifying issues planning action, taking action and evaluating action", that "an Action Research Strategy combines both data gathering and the facilitation of change". Also that "Action Research has implications beyond the research project", "there are also likely to be consequences for organizational development and culture change" that it is an "emerging strategy", also that "it is likely that you will need to introduce further strands of literature later in your report as you interpret and discuss the themes which emerge from your Action Research "it will be more authentic to introduce and discuss new strands of literature which will only become obvious to consult after undertaking Action Research rather than attempting to hide this by producing one Literature Review chapter early in the report to imply that all literature was consulted before the research commenced. 380

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42635-5 Master e-book ISBN, ISBN 0-203-73459-9 (Adobe eReader Format) also available at http://oro.open.ac.uk/20891/ which states:

> Abstract "In Learning with Information Systems the author takes the developing world as the context and through a series of case studies develops a commonly used systems analysis methodology. He demonstrates how this methodology can evolve and adapt as new ideas become prominent. Issues of sustainability of information systems, participation in systems design and user ownership of systems are all examined." (Accessed 03 January 2022)

This was first published in 1996 1996 by Routledge, London, UK

380 Saunders, Mark. N. T., Lewis, Philip., Thornhill, Adrian., (2019) *Research Methods for Business Students* Eighth Edition UK Pearson Pages 202-204 and 723-724

My Action Research will be mixed methods as it applies quantitative and qualitive methods to primary data interpretation through use of Leximancer AI analysis. It also uses Rich Pictures sourced through Leximancer AI data interpretation. Berg, T., Bell, S., and Morse, S., (2019) advocate use of Rich Picture, describing the methodology as "a flexible space where any practitioner can negotiate shared understanding without methodological constraint" noting that "these pictures are used primarily to help groups and individuals to understand complex contexts, be they natural, social, technical or cultural" that "can on occasion – by their spontaneity, serendipity and creativity – offer unforeseen and unbiased insight into differing perceptions," proposing use of Rich Picture (RP) "as a means to explore bigger picture analysis which may provide insight on issues and possible solutions" and they question the benefit of peer review processes, noting a "growing awareness of shortcomings in this regard," "as it is allows for partial truths to be concretised in what often appears to be a terrified and slavish conformity. Once a 'truth' has been identified, it is a brave person who seeks to re-model, re-consider or even question. This is a core concern of this paper."

They highlighted that Rich Picture "is particularly useful as a 'low tech' dialogic tool offering a platform to aid a thinking process" and that "the value of visual metaphors in problem structuring has been demonstrated across different literatures", and they conclude that it is, "a platform for group imagination, sharing stories, discovering truths (and falsehoods); consensus and conflict," "which allows group members to immerse themselves in imaginative thought experiments about all manner of potential futures" that "by this means a RP has the potential to address the occult, hidden and 'elephant in the room' concerns", highlighting the "practise and the innovation by which the tool is being

applied to different situations.[381] Sensemaking Frameworks which produce Rich Pictures, include the Cynefin Sensemaker, and Leximancer, analysing wording in text of documents, stories told, social media comments, under Themes and Concepts, traceable back to the original wording providing Rich Pictures,. I proposed to use an AI augmented framework analyse data to interpret the data and findings.

### 3.3.2 Tell A Clear Story

Saunders, M., et al., (2019), emphasize it is important to "tell a clear story", noting, "this is where writing the abstract really helps" as it "forces you to think clearly about the storyline because you have to summarise it in so few words" 382

I decided as part of Action Research to consult with Citizens using Narrative. Dillon, S., (2011) establishes that story and narrative can be used interchangeably with the latter the more 'academic' or 'serious' denotation and explores six functions of stories, communication, individual and collective identity formation, exercising empathy and theory-of-mind, development of social knowledge, repository and transmission of socio-

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381 Berg, Teresa., Bell, Simon., and Morse, Steve., (2019), *Using Rich Pictures outside of soft systems methodology a case study analysis*. Pages 257, 259, 261, 262, 272 and 273. Published by Berg, Teresa., Bell. Simon., and Morse, Steve. UK, International Journal of System of Systems Engineering Vol 9, No. 3. Pp257-276, January 2019 DOI: 10.1504/IJSSE.2019.102815 available at https://www.inderscienceonline.com/doi/abs/10.1504/IJSSE.2019.102815 (accessed 03 January 2022)

382 Saunders, Mark. N. T., Lewis, Philip., Thornhill, Adrian., (2019) *Research Methods for Business Students* Eighth Edition UK Pearson Page 732

cultural knowledge, simulation and modelling, in order to guide decision-making, and persuasion, especially belief change.383

A Global Timeless Story in 91 Words:

"We came upon him sitting in the sun,
Blinded by war, and left. And past the fence
There came young soldiers from the Hand and Flower,
Asking advice of his experience.

And he said this, and that, and told them tales,
And all the nightmares of each empty head
Blew into air, then, hearing us beside,
'Poor chaps, how'd they know what it's like?' he said

And we stood there, and watched him as he sat,
Turning his sockets where they went away
Until it came to one of us to ask
'And you're – how old?'
'Nineteen, the third of May'."384

Pre-AI yes. Timeless? Yes. War is everywhere today. About war? Or lives impacted, multiple perspectives? About the fight for Democracy? Daily lives? Feelings? Perspectives? Influencing voice? Your decision.

383 Dillon, Sarah., Dr. (2011) The Function of Stories Pages 1-5 Published by Dillon, Sarah., Dr. the Faculty of English, University of Cambridge, Cambridge, UK Available at The-Function-of-Stories-Dr-Sarah-Dillon.pdf - The Function of Stories Dr Sarah Dillon Reader in Literature and the Public Humanities Faculty of English | Course Hero (accessed 11 December 2021)

384 Postgate Cole, Margaret., quoted by Reilly, Catherine., (1992) Scars upon my heart Women's Poetry and Verse of the First World War. Pages 22-23 The Veteran May 1913, by Margaret Postgate Cole. Published by Margaret Postgate Cole, Reilly, Catherine., Virago Press Ltd, Cambridge, UK. ISBN 0-86068-226-9

A modern-day AI Robotics story is the world's first Robot Citizen and UN innovation champion. The UN (2017) Sophia joined a meeting about AI and sustainable development and discusses her growth and beginnings of emotional intelligence."385 (EI)

**Figure 3.4: Robot Citizen Voice., (2017) UN Deputy Chief Interviews Social Robot Sophia**

I proposed to develop up to 8 AI ethics and policy 'stories' to seek citizen perspectives on same. My research proposed to develop a Model of AI governance as an

385 UN (2017) Robot Sophia joins meeting on artificial intelligence and sustainable development. UN, Geneva, Switzerland. At UN, robot Sophia joins meeting on artificial intelligence and sustainable development | | UN News (accessed 12 December 2021) Available on YouTube at UN Deputy Chief Interviews Social Robot Sophia - YouTube (accessed 12 December 2021)

output of examining the relationship between evaluate the relationship between an AI governance framework for financials, data, and Public Policy. This research primary data will be collected in 6 cycles.

<table>
<tr><td>Correlation between Ethics AI RPA ML Blockchain Financials and Public Policy<br><br>Using AI global principles, IMF audited financial data prepared for GFSM, Policy Cycle and PSC financial appraisal</td><td>Citizen voice<br><br>Citizen Voice Carnegie Council, Conference on the Future of Europe Platform and UN, AI Scenarios.</td></tr>
<tr><td colspan="2">Quantitative risk assessment using risk taxonomy to link AI ethics traits, Policy and IFAC stances. Risk Assessment to be undertaken using the Canadian Government AIA</td></tr>
<tr><td colspan="2">A new/adapted model for algorithmic governance will developed.</td></tr>
<tr><td colspan="2">Use AI (IBM Watson or DPER RPA) to prepare a longer-term financial appraisal budget using GFSM and audited financial data in Ireland.</td></tr>
<tr><td colspan="2">Model: “Artificially Intelligent Ethical Public Policy” Including:<br><br>1. Risk assessment<br>2. AI Financials, Continuous, Staff AI augmented supports<br>3. Citizen AI engagement<br>4. Public Policy Cycle AI engagement<br>5. Blockchain use including cryptocurrency<br>6. AI RPA Swarm Robotics use including Smart Cities<br>7. AI Augmented Game Theory Model</td></tr>
<tr><td colspan="2">Action Research Learnings - an Advocacy Role</td></tr>
</table>

**Figure 3.5: Action Research Mixed Method approach to Primary Data Collection and Expected Outputs by Marita Gonsalves (2021)**

### 3.4 Data Sources, Technology, Governance and Financials

To research this, my mixed method approach is concurrent triangulation the collection of quantitative data using global ethics standards, financial data and corporate governance frameworks, a case study approach sampling the OECD, the Canadian Government, the European Union, the Irish Government, financial data uses in public policymaking, correlating the instances where AI informs this data, via rule-based systems, algorithmic decision making.

Data sources will include IMF government datasets using the Government Financial Statistical reporting framework, which the International Monetary Fund (IMF) (2021) note as internationally recognized as helping national authorities to strengthen their capacity to formulate fiscal policy and monitor fiscal developments.386

Other sources used will be, USA NIST on AI387 Yaga, D., Mell, P., Roby., and Scarfone, K., NIST (2018) note that "blockchain technology is the foundation of modern cryptocurrencies, so named because of the heavy usage of cryptographic functions" and also that "there is a growing interest in other sectors", that it is "new technology still" and that it "should be investigated with the mindset of how could blockchain technology potentially benefit us?' rather than 'how can we make our problem fit into the blockchain

386 International Monetary Fund (2021) *About Government Finance Statistics* Page 1 The IMF (2021) note the database has detailed data on revenues, expenditures, transactions in financial assets and liabilities, and balance sheet data, and also includes data for the general government sector and its subsectors (central government, local government, state government and social security funds). *IMF Data International Finance Statistics, Government Finance Statistics* website was last updated 06 March 2021 Website viewed 09 March 2021

387 USA, Department of Commerce, National Institute of Standards and Technology (NIST)., (2021). website https://www.nist.gov/artificial-intelligence (Accessed 07 June 2021)

technology paradigm?'. They state "blockchains are tamper evident and tamper resistant digital ledgers implemented in a distributed fashion" (i.e. without a central repository) and usually without a central authority (i.e. a banks, company or government).388 Today governments globally are increasing using Blockchain sometimes with RPA for example the USA federal government in grants management. Possible use of Blockchain in Ireland and the EU will be explored both in non-financial and financial opportunities.

Ireland's government financial data at all tiers, which is available on the open portal, 'Whereyourmoneygoes'389 is audited by Ireland's Supreme Audit Institution. The budget data depending upon the year on the portal is approved by the public scrutiny processes. All sources and governance approvals will be stated.

The EU and Irish Public Service, corporate governance frameworks, ethical frameworks and financial frameworks are all publicly available. The Irish Civil Service audit, assurance and compliance arrangements framework is set out in the corporate governance standard (2019) This standard is to be used by each department and office to guide the development of their individual governance frameworks390 and will be

388 Yaga, Dylan., Mell, Peter., Roby., Nik and Scarfone, Karen., NIST, (2018), Blockchain Technology Overview. NIST Interagency/Internal Report (NISTIR), National Institute of Standards and Technology, Gaithersburg, MD, [online], https://doi.org/10.6028/NIST.IR.8202 Pages iv, vi. Published by Yaga, Dylan., Mell, Peter., Roby., Nik and Scarfone, Karen., NIST USA, Blockchain Technology Overview | NIST (accessed 12 December 2021)

389 Ireland, Department of Finance and DPER, (2021). Whereyourmoneygoes website

390 Ireland, DPER., (2019). *Corporate Governance Standard for the Civil Service.* Page 26. DPER, Dublin, Ireland. Retrieved from: https://assets.gov.ie/5509/100119144712-73354f908b574c46b20623ecd0647087.pdf (Accessed 12 December 2021)

evaluated in the context of this research as it is used to develop other Public Service frameworks in Ireland.

"This standard is to be used by each department and office to guide the development of their individual governance frameworks. This is the first time that such a standard has been produced for the civil service as a whole." 391

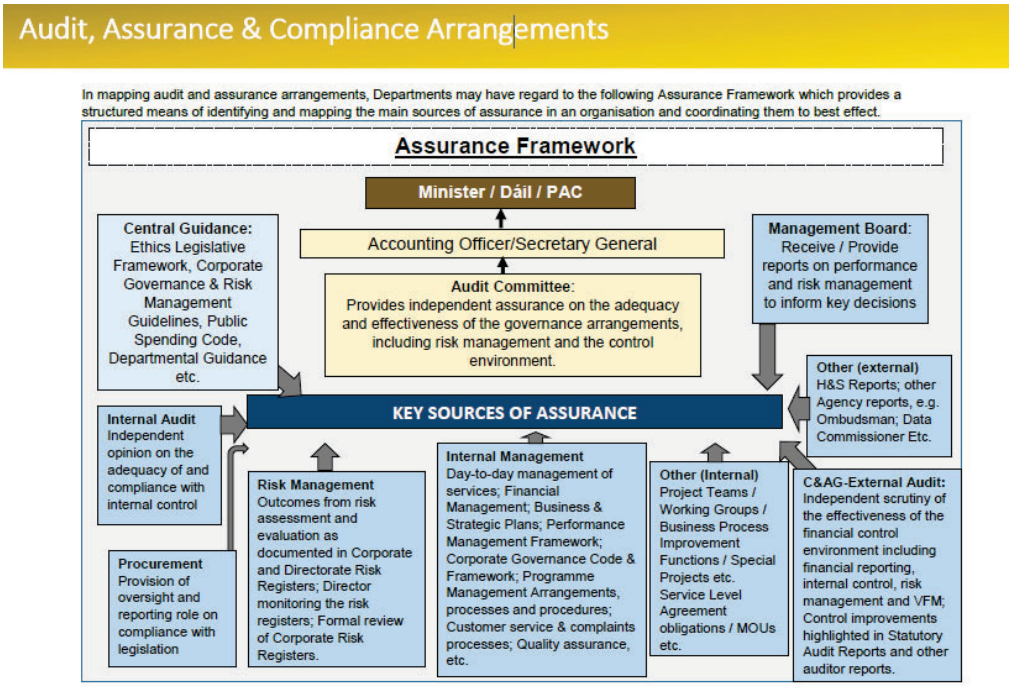


**Figure 3.6: Corporate Governance Standard for the Civil Service, Ireland., (2018) Algorithmic government technology stack is missing**

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391 Ireland, DPER., (2019). *Corporate Governance Standard for the Civil Service.* Page 26. DPER, Dublin, Ireland. Retrieved from:https://www.gov.ie/en/publication/f6667b-corporate-governance-standard-for-the-civil-service/ (Accessed 12 December 2021) (Website last updated 15 April 2019)

Citizen voice is another data source.

Risk assessment for AI technologies will be undertaken, using the Canadian Government Algorithmic Impact Assessment open-source questionnaire.392 The initial 'walkthrough risk assessment' to confirm my understanding of how the tool operates, based on the manual Public Spending Code systems of Ireland and undertaken on 06 June 2021 indicated an impact level of 3, impact score 68 and mitigation score of 40. Further work will be done to confirm use of the tool.393 All of Ireland's Public Sector must follow this code when spending Public Funds.

Fulton, B., of the Ethics and Compliance Initiative, (2021) stated "AI and predictive analytics has changed the ways in which organizations create products and do business" noting that "developing AI systems to optimize risk management, can have exponentially positive effects" supporting ethics and compliance, if "developed with a core set of guiding principles". He stated that "big data is powerful and if you learn to leverage it correctly, it could help ethics and compliance practitioners develop complex risk management

392 Canada Government., (2021). *Algorithmic Impact Assessment Tool.* Canada Government. Ottawa. Retrieved from: https://www.canada.ca/en/government/system/digital-government/digital-government-innovations/responsible-use-ai/algorithmic-impact-assessment.html (Accessed 06 June 2021: Website list modified 2021 04 01)

393 Canada Government., (2021). *Canada Algorithmic Assessment Tool Results Policy Support Tool Public Spending Code Financial Appraisals.* Canada Government. Ottawa. Undertaken 06 June 2021. Retrieved from: https://canada-ca.github.io/aia-eia-js/Results (Walkthrough risk assessment undertaken 06 June 2021)

procedures and other tasks important to a high-performing ethics and compliance function.394

ElementAI (2021) state in this regard that there is something to be said for the experimental approach to adopting AI, that it is impossible to see every AI opportunity ahead of time, even for teams who are skilled at judging good opportunities from bad, that by just jumping in, you learn fast by failing fast, but that failing fast does not set you up for long-term success. They state that learning by experiment is a critical supporting tactic for adopting AI, that this is not a strategy. An AI roadmap is that strategy, allowing you to plan and choose the best tactics for intelligent AI adoption at your organization.395

If applicable for policy development, AI Economist Building AI open-source project will be contributed to. They sought input from Economists and Policy Experts as well as Technologists.396

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394 Fulton, Brad., of the Ethics and Compliance Initiative., (2021), Optimizing Risk Management Using Artificial Intelligence Benefits and Risks of using big data to create effective ethics and compliance programmes. Paragraph 2 Published by Fulton, B., Ethics and Compliance Initiative., Arlington, Virginia, USA. Available at https://www.ethics.org/?s=Fulton+B+ai+and+predicitve+analytics+is+powerful+and+supports+ethics+and+compliance (Accessed 05 June 2021)

395 ElementAI., (2021). *Building a strategic AI roadmap for your business* ElementAI, Finland. Retrieved from: https://www.elementai.com/news/2019/building-a-strategic-ai-roadmap-for-your-business

396 Zheng, Stephan., Trott, Alexander., Srinivasa, Sunil., Naik, Nikhil., Gruesbeck, Melvin., Parkes, David C., and Socher, Richard., Salesforce. (2020). *The AI Economist: Improving Equality and Productivity with AI-Driven Tax Policies*. Salesforce, San Francisco, USA. Retrieved from https://github.com/salesforce/ai-economist/blob/master/README.md (accessed 07 June 2021) Note arXiv:2004.13332.

### 3.5 Data Analysis and Procedures

This data analysis will be used to identify themes and patterns which will be explored through a collaborative approach with the Robotics Process Automation (RPA) team in DPER, the DPER National Infrastructure Office (NIO), Citizen stakeholders, PeakConnexxion Ltd who coach senior policymakers in the public service, colleagues in my Department and the Office of the Government Chief Information Officer (OGCIO) Ireland, for one cycle and others, as the Action Research develops.

It seeks to develop a robotics and machine learning approach for exchequer appraisals. Financial appraisal is a requirement Ireland's Public Spending Code at many stages of the policy cycle.

There is precedent for this approach. The OECD (2017) cite a case study of collaboration Umamaheswari et al., (2016) between PHD students and crime analysts to design a machine learning algorithm called "Series Finder", which uses historical criminal data to detect housebreak patterns and build a *modus operandi*. This algorithm was considered a powerful tool to assist the police detecting series of crimes and identifying likely suspects.397398 I propose to collaborate with DPER RPA team and use the data and

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397 OECD., (2017). *Algorithms and Collusion: Competition Policy in the Digital Age* Page 13. OECD, Paris, France. Retrieved from: Algorithms and Collusion: Competition Policy in the Digital Age (oecd.org) (Accessed 31 May 2021)

398 Umamaheswari, Mrs. B., Nithya, Dr. P., Chandran Miss. Nair Shrika., (2016) *Survey on web crime detection using data mining technique* Published IJARCET, International Journal of Advanced Research in Computer Engineering and Technology Volume 5 Issue 1, January 2016 Page 178 and cited in OECD (2017) *Algorithms and Collusion: Competition Policy in the Digital Age* Page 13

insights from my financial statistics and governance review, to ascertain if AI exchequer flow appraisals in real time, using historic expenditure, and setting out the governance structures surrounding it, provide a transparent basis for budgets and how they would integrate into existing financial and ethics governance frameworks in Ireland. AI augmented financials, and it's governance, would be hugely significant in terms of policy advice and support, and this pilot study could then be used to develop other modes of financial data use in public policymaking.

### 3.6 Research Data Interpretation

Nilsson, M., et al. (2008) outline that government already have in place many formal policy assessment systems to facilitate more evidence-based policy-making, from complex computer models, economic appraisal through cost benefit analysis through simple checklists and decision-trees but question their adoption by policy-makers, noting in a review of the use and non-use of such appraisal tools in public policy-making in three European countries and the European Union, there was evidence the more advanced tools were not being used, that the policy assessment tools used were of a simple and qualitative type399. But where does this place AI, financial data analytics in policymaking?

399 Nilsson, Mans., Jordan, Andrew., Turnpenny, John., Hertin, Julia., Nykvist, Bjorn., Russel, Duncan., (2008) *The use and non-use of policy appraisal tools in public policy making: an analysis of three European Countries and the European Union* Policy Sci (2008) 41:335-355 DOI 10.1007/s1 1077-008-907-1 Pages 335,352

DiBlas, N., et al (2017) state data are available like never before, creating a treasure of information in wait for the right time to be put into services, that the Big Data challenge has made the issue of 'making sense' of data urgent and unavoidable400

Weick, K., (1995) notes what is emerging as a growing issue for sensemaking is the disparity between the speed and complexity of information technology and the ability of humans to comprehend the outputs of technology401.

Kurtz, C. F., and Snowden, D.J., (2003) Cynefin Sensemaking framework for decision-making supports policy-making using citizen engagement tools but also with a framework which identifies how people perceive and make sense of a situation. The Cynefin Framework has five domains Known, Knowable, Chaos, Complex and Disorder, and unlike categorization frameworks, none are identified as more desirable than any other. It is used to consider the dynamics of situations, perspectives, decisions, conflicts, and changes, in order to come to a consensus for decision-making under uncertainty402. The Agile Consortium Belgium (2021) representation of the Cynefin Domains, highlights the sensemaking framework in a simple and effective way.

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400 Di Blas, Nicoletta, Di., Mazurnan, Mirjana., Paolini, Paolo., Quintarelli, Elisa., Tanca, Letizia., (2017) *Exploratory computing: a comprehensive approach to data sensemaking* Springer International Publishing Switzerland, International Journal Data Science Anal (2017) 3:61-77 DOI 10.1007/s$1060-016-0039-5 Page 61

401 Weick, K. (1995) *Sensmaking in Organisations* Sage publications International Educational and Professional Publisher Thousand Oaks, London, New Delhi, Pages 177-180 Page 177

402 Kurtz, C.F., Snowdon, David. J., (2003) *The New Dynamics of Strategy Sense-making in a complex and complicated world* IBM SYSTEMS JOURNAL, VOL 42, NO 3, 2003 Pages 462,468

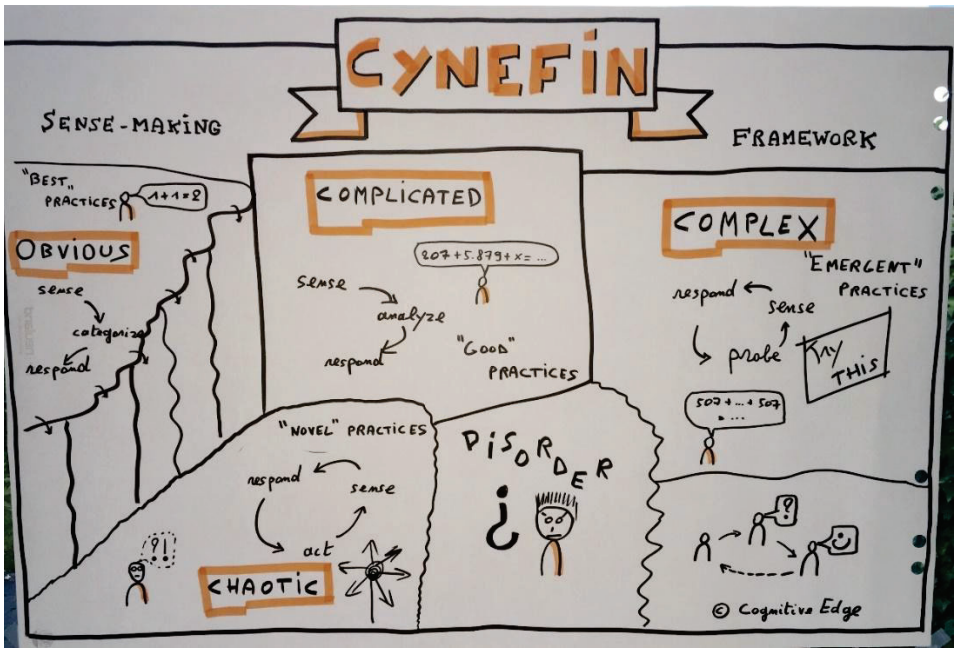


**Figure 3.7: Cynefin Sensemaking Framework by Cognitive Edge and Agile Consortium, (2021)403**

Cognitive-Edge (2020) highlight that Sensemaker@ can be used to gain insight into perceptions and experiences of citizens by policymakers.404 Van der Merwe, Susara., et al (2019) research into use of the Sense-Maker method, concludes that Sensemaker@ replaces immersive interviews by researchers, that micro-narratives can obtained directly using collection tools, is a form of distributed ethnography and transfers the onus of interpretations of narratives from the researcher to the participants, removes ethnographic coding and expert re-interpretation, reducing researcher bias and allows for more objective analysis, that as a research tool, it is suitable to explore associated meaning and

403 Cognitive Edge Cynefin Domains Picture (2021) UK Retrieved from https://value-first.be/agile/cynefin-sense-making-framework-by-cognitive-edge-an-introduction/ Printed by Agile Consortium Belgium

404 Cognitive-Edge, UK (2020) *Sensemaker® for Government* Website

relationships between concepts.405 CognitiveEdge (2020) state this tool is available for academic institutions who are engaging on applying complexity methods across a range of applied research and public good initiatives. 406

Well, it wasn't to be. They never responded despite repeated contact. It was expensive as a commercial user over €1,500 and could not be justified. I researched other methods and settled on Leximancer. Leximancer (2021), website states "Leximancer automatically analyses your text documents to identify the high concepts, delivering the key ideas and actionable insights you need with powerful models, interactive visualisations and data exports. Sentiment analysis without the bias," there is "no human bias", "powerful visualization", "no coding required" and a "sentiment lens". "Text is more than a collection of words; text tells a story. Ideas, concepts, and relationships are buried in the words. Identifying the concepts quickly and effectively is key to taking advantage of what the text is really saying."407 I took out a 30-day free trial to explore it. I was satisfied as to the transparency of the AI. I took out a paid subscription for three months to use Leximancer analysis for my Action Research cycles. It cost $600 in total.

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405 Van der Merwe, Susara, E., Biggs, Reinette., Preiser, Rika., Cunningham, Charmaine., Snowden, David J., O'Brien, Karen., Jenal, Marcus., Vosloo, Marietjue., Blignaut, Sonja., and Goh, Shen., (2019). *Making Sense of Complexity: Using SenseMaker as a Research Tool* Systems. 2019; 7(2):25. Pages, 3, 10.

406 Cognitive-Edge., (2020). *Sensemaker® for Government.* Retrieved from Cognitive-Edge- SenseMaker®-for-Government, UK. (Accessed 07 June 2021)

407 Leximancer., (2021) Go beyond text find meaning Website by Leximancer, Adelaide, Australia. At https://www.leximancer.com/ (accessed 11 December 2021)

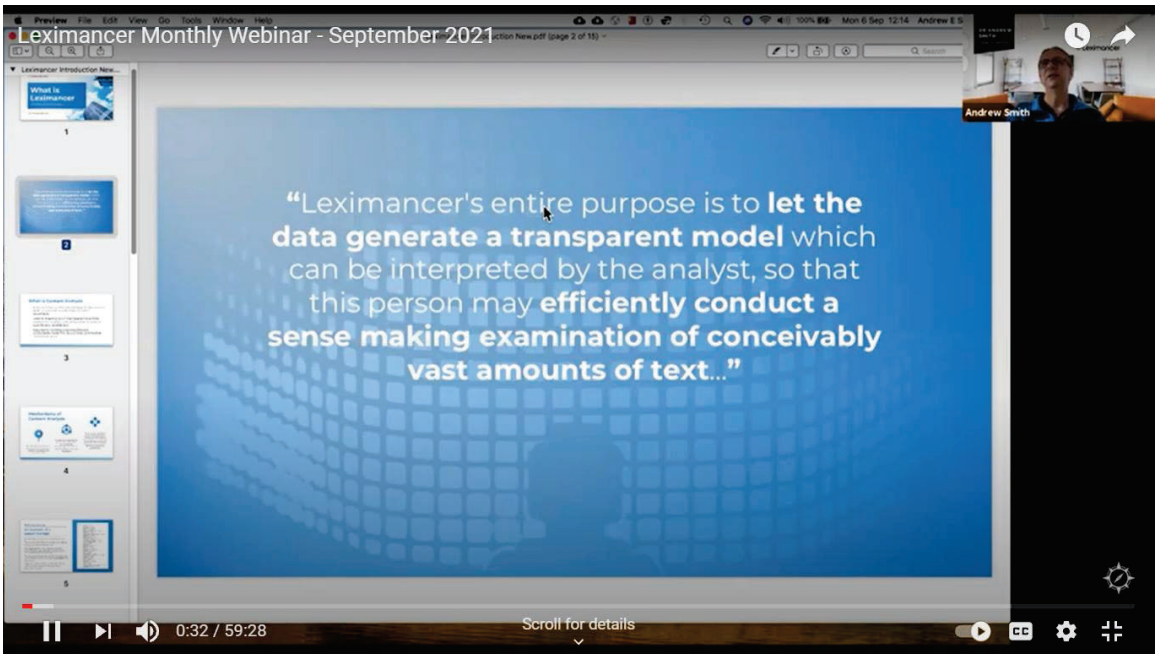


**Figure 3.8: Leximancer Monthly Webinar (2021) Attended September 2021 available at Leximancer Monthly Webinar - September 2021 - YouTube**

Leximancer (2021) identify other features of Leximancer including "Find concepts in context, Natural language processing; Semantic discovery; No model training required; Powerful visualisation; Delivers a model in moments; Unsupervised machine learning; Robust sense making; Independent validation by researchers; Unstructured text analysis408

Luna-Reyes, L. F., Andersen, D. F., Black, L. J., Pardo, T. A., (2021) highlight the importance of social and sensemaking processes in the development and execution of wide

408 Leximancer (2021) Leximancer Brochure 2021. Page 3. Published by Leximancer, Adelaide, Australia. Available at https://static1.squarespace.com/static/5e26633cfcf7d67bbd350a7f/t/610b5d4170bb2a7992c09ad6/1628134895816/Leximancer+Brochure+2021.pdf (Accessed 11 December 2021)

scale digital government initiatives. That cities and governments are currently dealing with decisions on sensor and data analytic tools to develop smarter cities and that governments at every level are investigating or implementing tools for AI and big data analysis to promote evidence-based policy and decision-making, but that those involved in the projects may not fully understand the implications of the technical applications undertaken in government. They state that the expectations of government leaders need to be managed, that they can often urge pressure for fast responses and publicly visible progress, which could result in agencies moving quickly into technology implementations before there is a shared understanding of 'what' and 'why' has been achieved by the project team. They re-iterate the importance of social and sensemaking processes to make progress in unspecified or goal-conflicted yet innovative efforts, such as those in which governance is not clearly defined.409

The questions in the Canadian Government, Algorithmic impact assessment tool for business applies to the business of government. The tool is opensource other countries and individuals may use it or contribute to it. It would be used in my questionnaire designed for citizen engagement.410 Initial Cuts to determine approach General Workings before

409 Luna-Reyes, Luis. Felipe., Andersen, David. F., Black, Laura. J., Pardo, Theresa. A., (2021) Sensemaking and social processes in digital government projects. Pages 1, 9, 10. Science Direct, Government Information Quarterly, Issue 38 (2021) 1015770. Retrieved from https://www.sciencedirect.com/science/article/abs/pii/S0740624X2100006X (accessed 05 June 2021) DOI https://doi.org/10.1016/j.giq.2021.101570

410 Canadian Government., (2021) *Algorithmic Impact Assessment Tool online.* Canadian Government. Ottawa, Canada. Retrieved from: https://www.canada.ca/en/government/system/digital-government/digital-government-innovations/responsible-use-ai/algorithmic-impact-assessment.html (Accessed 31 May 2021. Website last modified 2021 04 01)

data collection, will be completed and reported as part of data findings, including outcome of engagement with DPER NIO and other.

Exchequer funds assurances are sought annually from all entities, a manual process and linking with PSC Financial Appraisal, could this assurance be provided much more easily using AI, RPA and Blockchain? EU OPSI blockchain for EU grants. The checklists of information requested is in Appendix C.

I have referenced DPER RPI but might not be using as initial responses indicate agreement for the need but unwillingness to develop unless I can provide a budget for the work. The email requests and conformation will be a finding for the next section.

The initial assignment and Chapters 1 and 3 initial drafts have been shared with colleagues of the Department of Housing, Local Government and Heritage and with Peak Connexxion Ltd. AI game theory may be explored in greater detail with Peak Connexxion Ltd.411 If AI education game theory is progressed in this manner, rather than the game theory approach as noted by the Singapore government, or an open-source alternative, section **3.8 Ethics and Human Subject Participation in this Research** below will be expanded. Ho, P., (2016) of the Singapore Civil Service college, highlights the power of Games supporting engagement in and understanding of public policy goals, referencing examples including World of Warcraft which shows how people handle and unexpected

411 PeakConnexxion Ltd. (2021) *CEO Georgina Corscadden*. Retrieved from https://www.linkedin.com/in/georginacorscadden/?originalSubdomain=ie (Accessed 07 June 2021)

plague, a game highlighting a Syrian refugee story, and a game designed to test public sector values of integrity, service, and excellence, in real life situations.412

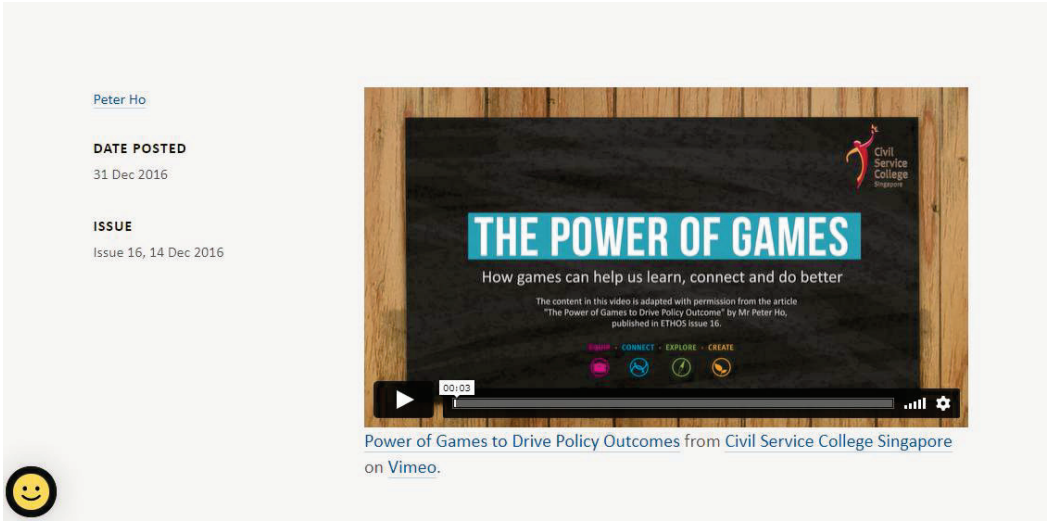


**Figure 3.9 The Power of Games to Drive Policy Outcomes, (2016), Ho, Peter., Civil Service College, Singapore, Singapore**

### 3.8 Ethics and human subject participation in this research

Citizen Voice was sought at Carnegie Council who required confirmation the scenarios were endorsed by the Department of Housing, Local Government and Heritage. Carnegie Council had advised they were happy to upload the scenarios, but that they considered it would be unethical to promote my doctorate. I was happy to agree, as the citizen voice findings were confirmed as being provided to Carnegie Council and my department had funded the research.

412 Ho, Peter., Civil Service College Singapore, China, (2016), The Power of Games to Drive Policy Outcomes. Video Published in Ethos Issue 16 by Ho, Peter., Civil Service College Singapore, Singapore, available at https://www.csc.gov.sg/articles/the-power-of-games-to-drive-policy-outcomes (accessed 12 December 2021) (Website last updated 29 July 2021)

The citizen responses on the Conference of Europe Platform are in the public domain and will be used in a policy development forum in the EU beyond this research. There was no direct contact with citizens on either platform.

At every stage, and as each Chapter was written, I offered to provide it to the Department research forum. The initial outline was read and commented upon but after that there was no take up. The Department sought updates about the national Build to Share Digital Tool for Public Spending Code I developed with the OGCIO as part of the Action Research as my role is Strategic Policy, Public Spending Code Governance Mapping. My unit was involved in scoping and user acceptance testing. It is being rolled out for use by my department, in January 2022, as Ireland's national pilot.

# CHAPTER 4

## AI PARADIGM SHIFT

### 4.1 Introduction

"The Department is happy to support your application. Would you consider a research topic that is more tightly focused on the needs of the Department? e.g. research in one of the Department's/Division's areas of responsibility, like a housing economics / market topic."413

Robson, C., (2019), states that, as with evaluation research, action research is primarily distinguishable in terms of its purpose, which is to influence or change some aspect of whatever is the focus of the research, that improvement and involvement are central, that firstly, there is improvement to a practice of some kind, secondly, there is improvement of the understanding of a practice by its practitioners and thirdly, there is improvement of the situation in which the practice takes place, and while observing that the research cycle is seen as a spiral, or cyclical, they also state that as with most representation of what happens in research that this is an idealization and that in practice it is unlikely to be as neat and linear as suggested.'414 My research cycles cover the period January 2021 to December 2021

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413 Department of Housing, Local Government and Heritage, (2020) the approval email from my Assistant Secretary that I could apply to my Department training section to fund my doctorate. This Email dated 12 October 2020. I then submitted to our HR for approval by management board. HR advised they approved. I then submitted to SSBR who approved my application Q4 of 2020.

414 Robson, Colin., (2011) Third edition *Real World Research.* Pages 188-190, Published by Robson, C., Wiley and Sons Ltd, Printed by TJ International Ltd, Cornwall UK. ISBN 987-1-4051-82409.

My research question is, 'How does an AI governance framework benefit public policy?' I scoped my research to explore as action research, Ireland's Public Spending Code, the Code which underpins public policy. This Action research was with a view to effecting change and improvement in a primarily manual process.

I was happy to accommodate this request, my Department, the Department of Housing, Local Government and Heritage, is a policy-making Department, our Minister sets financial accounting standards for local government, operating applying modified accrual accounting basis, the Department prepares its' reports and financial statements on a modified cash basis, and is committed to progressing to accruals-basis as part of a group of government entitles moving to a financial management shared services (FMSS) model, and as with other Departments also approves billions in capital and current expenditure for major investment and social programmes applying a set of VFM rules, known as the Public Spending Code (PSC) as well as government accounting circulars. VFM and expenditure management are coming under focus over the years.

Pauwels, Elonore., and Cockayne, James., (2018), stated that globally we are at the beginning of the deployment of AI across our economic, political, and social systems, that the effects are already inducing profound anxiety for those states or citizens who fear a loss of power, they note that it is a challenge to determine where AI fits into global governance, and note that we are confronting an important ethical crossroad. Interestingly they reference 'AI on the streets' through citizen science and democratised innovation systems. They noted that all stakeholders consider their roles in shaping the governance of AI.415

415 Pauwels, Elonore., and Cockayne, James., (2018), *Artificial Intelligence and Global Governance: A Thought Leadership and Engagement Platform.* Paragraphs 3, 8, 12, 16 and 17. Published by the United Nations University

They didn't mention governance by AI. I had been thinking about AI, a new paradigm, Policymaking, EU, Global Values, Social Unrest, Democracy, and an emerging AI augmented Citizen Voice. It was a wonderful opportunity to undertake Action Research on PSC and public policy and reflect on ethics, financials, governance, citizen voice in public policy also in the global governance context.

In my Action Research first and second cycles I progressed AI RPA financial appraisal and commenced development of a bespoke PSC case management system e-PSC. I have offered all Chapters to my Assistant Secretary and offered twice to date, to update the Housing Cross-Division policy meetings, on my research, the topic and progress. That forum is used to update colleagues in the Housing Divisions on research being done in the area. I received no response, and the research was not added to the Agenda for the Housing Division Research program.

### 4.2 AI Bringing Science to the Art of Policymaking

Jessop, T. Edmund., and Cranston, Maurice., (2021) describe David Hume (1711-1776) as a 'Scottish Philosopher, Economist and Essayist', and state that Hume felt people are influenced more by feelings than reason. 416 The Polymath's Paradise (2020) sets out Hume's theory on two ways of learning, called Hume's Fork' which differentiates between

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https://ourworld.unu.edu/en/artificial-intelligence-and-global-governance-a-thought-leadership-and-engagement-platform (accessed 19 August 2021)

416 T, Jessop, T. Edmund., Cranston, Maurice., (2021, May 3). David Hume. Encyclopedia Britannica. Published by Encyclopedia Britannica online, available at https://www.britannica.com/biography/David-Hume (accessed 15 August 2021)

a ‘relation of ideas’ (true by definition for example mathematical definitions, and can be justified outside of an individual’s experiences), and ‘matters of fact’ (true because of how the world is e.g. scientific discoveries because they are not always certain and there are advances in knowledge). 417

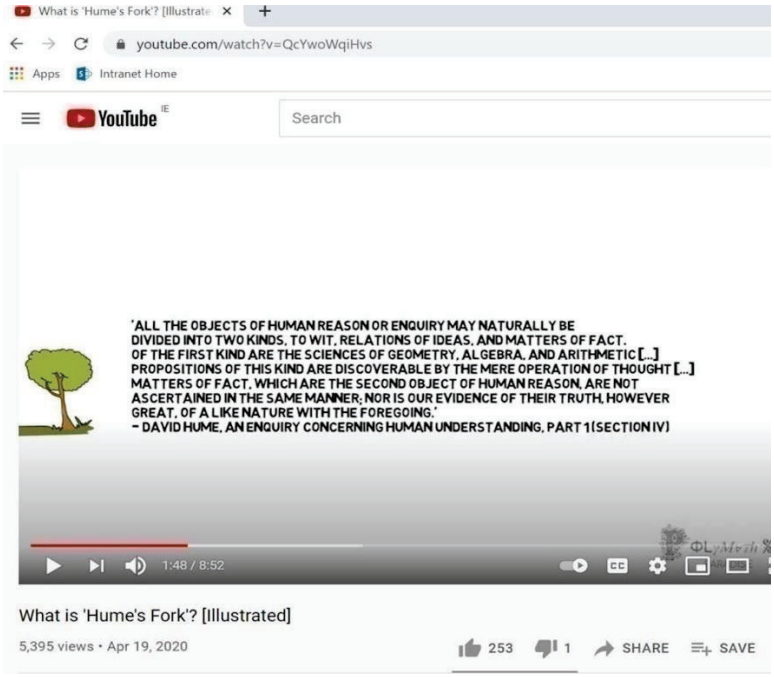


**Figure 4.1 The Polymath’s Paradise (19 April 2020): What is Hume’s Fork? [Illustrated] Available on YouTube https://www.youtube.com/watch?v=QcYwoWqiHvs accessed on 09 August 2021.**

Patel, Jaykumar., Manetti, Martin., Mendleshon, Matther, Mills, Steven., Felden, Frank., Littig, Lars., and Rocha, Michelle., (2021), highlight that AI brings science to the art of Policymaking, that by increasing the scale and type of information available to

417 The Polymath’s Paradise (19 April 2020): What is Hume’s Fork? [Illustrated] Available on YouTube https://www.youtube.com/watch?v=QcYwoWqiHvs 09 August 2021

decision makers, AI can help governments tackle problems comprehensively rather than narrowly and that the smart city model is emblematic of this joined up approach to policy acknowledging that by its nature, policymaking is lengthy, political and bureaucratic, but that AI can benefit policymakers at each of the stages in the policy cycle, identification, formulation, adoption, implementation and evaluation but also noting that technology isn't the primary barrier to AI implementation, success depends to a huge extent (they define it at 70%) on people and process and they note that in the public sector this includes building trust among citizens and civil servants regarding the safety and effectiveness of AI. They state organisational capabilities, and acceptance by both employees and citizens is fundamental to deploying AI in service of specific policy challenges.418

418 Patel, Jaykumar., Manetti, Martin., Mendleshon, Matther, Mills, Steven., Felden, Frank., Littig, Lars., and Rocha, Michelle., of Boston Consulting Group (2021), AI Brings Science to the Art of Policymaking, Pages 1-11. Boston Consulting Group, Boston, USA, available at https://mkt-bcg-com-public-pdfs.s3.amazonaws.com/prod/how-artificial-intelligence-can-shape-policy-making.pdf Accessed 09 August 2021

### 4.2.1AI in the context of Sustainability, extends to Climate Change, Social, Governance and Economic issues too

For example, climate change. Holmes, Brenton., (2011). Stated that a powerful case for greater citizen participation in policymaking arises from the emergence of what have been called ‘wicked problems’, also that these are problems that are highly resistant to resolution emerging in both the environmental and social spheres, that, at global level, wicked problems such as climate change have earned the descriptor ‘diabolical’419.

In Australia Schuijers, L., in May 2021 reported a landmark ruling on duty of care to future generations and climate change. The children had taken an unsuccessful class action on behalf of all Australian children and teenagers, against the Australian Environment Minister. They’d argued a project the Minister might approve for a coal mine extension would endanger their future, because of climate hazards, including causing the children injury, ill health or death and economic losses. The court found that a duty of care was owed to Australia’s young people not to cause them physical harm, in the form of personal injury, from climate change. The court findings were reported as summarised below. 420

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419 Holmes, Brenton., Politics and Administration Section, The Parliament of Australia, (2011) Citizens' engagement in policymaking and the design of public services Page 20. Research Paper No 1 2011-12. Published by Holmes, Brenton. Politics and Administration Section, The Parliament of Australia, Parliamentary Library, available at https://www.aph.gov.au/about_parliament/parliamentary_departments/parliamentary_library/pubs/rp/rp1112/12rp01#_ftn85 (accessed 03 March 2021)

420 Schuijers, Laura., (2021) In a landmark judgment the federal court found the environment minister has a duty of care to young people. Article extract in **Figure 4.2** Published by Schuijers, Laura., The Conversation, UK at https://theconversation.com/in-a-landmark-judgment-the-federal-court-found-the-environment-minister-has-a-duty-of-care-to-young-people-161650 (accessed 21 August 2021) Published 27 May 2021 8.12am British Standard Time

During the Federal Court's live-streamed summary, the court found that one million of today's Australian children are expected to be hospitalised because of a heat-stress episode, that substantial economic loss will be experienced, and that the Great Barrier Reef and most of Australia's eucalypt forest won't exist when they grow up.

It found this harm is real, catastrophic, and – importantly from a legal perspective – "reasonably foreseeable". In decades past, courts have considered climate change to be a "speculative", "future problem".

The court concluded, in the written judgment:

*It is difficult to characterise in a single phrase the devastation that the plausible evidence presented in this proceeding forecasts for the children. As Australian adults know their country, Australia will be lost and the world as we know it gone as well.*

*The physical environment will be harsher, far more extreme and devastatingly brutal when angry. As for the human experience – quality of life, opportunities to partake in nature's treasures, the capacity to grow and prosper – all will be greatly diminished.*

*Lives will be cut short. Trauma will be far more common and good health harder to hold and maintain.*

*None of this will be the fault of nature itself. It will largely be inflicted by the inaction of this generation of adults, in what might fairly be described as the greatest inter-generational injustice ever inflicted by one generation of humans upon the next.*

*To say that the children are vulnerable is to understate their predicament.*

**Figure 4.2 Australia Government, The Department of the Environment, Minister has a duty of care to young people, Australia, (2021) by Schuijers, Laura., Australia,**

Snow, Jackie., (2019) references a report on 'Tackling Climate Change with Machine Learning" noting 3 ways in which AI machine learning could tackle climate change mentioning better climate predictions, climate data and climate modelling, showing the effects of extreme weather and measuring where carbon is coming from, helping tackle

air pollution for example, noting that the biggest challenge on the planet might benefit from machine learning to help with solutions.421

Climate Change.AI, Rolnick, D., Priya, L., D., … Bengio, Y., (2019), paper by "machine learning experts" describes "how machine learning can be a powerful tool in reducing greenhouse gas emissions" making "recommendations which encompass exciting research questions as well as promising business opportunities." The areas are, Electricity Systems, Transportation, Buildings and Cities, Industry, Farms and Forests, Carbon Dioxide Removal, Climate Prediction, Societal Impacts, Solar Geoengineering, Individual Action, Collective Decisions, Education and Finance, thirteen Mitigation and Adaptation areas, and Luccioni, A., states in relation to Machine Learning (ML) and Finance, which is noted as a 'high leverage' area "especially fruitful for ML" also as an area "fruitful for ML practitioners wishing to have an outsized impact", that:

> "To date, the field of climate finance has been largely neglected within the larger scope of financial research and analysis. This leaves many directions for improvement, such as (1) improving existing traditional portfolio optimization approaches; (2) in-depth modeling of variables linked to climate risk; (3) designing a statistical climate factor that can be used to project the variation of stock prices given a compound set of events; and (4) identifying direct and indirect climate risk exposure in annual company reports. ML plays a central role in these strategies, and can be a powerful tool in leveraging the financial sector to mitigate climate change and in reducing the financial impacts of climate change on society."[422]

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421 Snow, Jackie., (2019) *How artificial intelligence can tackle climate change*. Paragraphs 6-16. Published 18 July 2019 by Snow, Jackie, National Geographic UK, at https://www.nationalgeographic.com/environment/article/artificial-intelligence-climate-change (accessed 21 August 2021)

422 Climate Change.AI, Rolnick, D., Priya, L., D., Kaack, L., H.,… Bengio, Y., (2019) Tackling Climate Change with Machine Learning. Pages 1, 4, and 58. Published by Climate Change.AI, Rolnick, D., (Ed.)Priya, L., D.,… Bengio, Y., on Climate Change.AI available at https://www.climatechange.ai/ paper at https://arxiv.org/pdf/1906.05433.pdf (Accessed 08 March 2022).

Nelsen, A., (2021), of Thomson Reuters Foundation, stated, "Algorithmic machine learning system are being lauded as an integral part of the new clean energy economy, but critics see them as an energy-intensive distraction". Also, that critics (unnamed) say "AI can also be highly energy-intensive and environmentally damaging" the critics also warning that "the tech could be a costly distraction from more effective ways of tackling climate change." But he notes that "ultimately the uses of AI in fighting climate change could depend on how it is regulated across borders".[423]

Thangaraj, T., (2021), notes that "Edge computing enables sustainability and climate awareness" he highlights the significant energy consumption of data centres and asks the rhetoric question "what if there is a way to reduce the reliance on these large-scale data centres while maintaining data and storage integrity with a more sustainable solution?" He noted edge computing can "store your data on the edge of your infrastructure so you aren't always sending large packets of information across the global network using bandwidth." that businesses can "specifically choose products that align with their sustainability goals" also referencing the "circular economy" which he notes is

> "The fundamental principle of the circular economy is that products should be designed with their whole-of-life consumption in mind. Ideally, products and services should be repairable and upgradable. Throwing them away and purchasing new ones is less beneficial. Products should also be produced in a way that is better for the environment and society. This can be accomplished through regulatory compliance, material content and consideration of their environmental impact.[424]

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[423] Nelsen, Arthur., Thompson Reuters Foundation., (2021), *How can artificial intelligence help fight climate change?* Paragraphs 1, 6 and 28 Published by Nelsen, Arthur., of Thompson Reuters Foundation, News.trust.org, London, UK. At World Economic Forum, Geneva, Switzerland, website, available at https://news.trust.org/item/20210805153021-fp4sh/ (Accessed 11 March 2022)

[424] Thangarji, Rajesh., of Schneider Electric., (2021), *Edge Computing enables sustainability and climate awareness.* Blog paragraphs 1, 2, 3 and 5. Published by Thangarji, Rajesh., Schneider Electric., Rueil-Malmaison, Ile-de-France, France, available

Climate change is an economic, social, and business risk that accountants must take action on, collectively as a profession and individually as professionals working in the public interest. for many, sustainability is associated with 'climate change', but as Chartered Accountants Ireland (2021) note in their sustainability guidance, it extends to social, governance and economic issues as well. 425

### 4.2.2 AI and the Correlation of Social Unrest and Economic or Financial Outcomes

Piepenburg, M., and Lott, T., (2020), Signals Matter LLC., article writes about social unrest today in the context of Bastille Day 1746, that that day "was the turning point date in the French revolution when a crowd of legitimately angry Parisians stormed the Bastille prison in an open act of defiance against a broken financial and political system" citing examples of the terrible impact on workers of pension funds lost and that "the link between financial disaster and social unrest is a human problem, and as such, it's a global problem". "Economics matter. Money matters." 426

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at https://blog.se.com/sustainability/2021/10/06/edge-computing-enables-sustainability-and-climate-awareness/ (accessed 11 March 2021)

425 Chartered Accountants Ireland (2021) *Sustainability Guide* Page 4 Published by Chartered Accountants Ireland at https://www.charteredaccountants.ie/docs/default-source/dept-public-policy/sustainability-for-accountants.pdf?sfvrsn=3db7ae7c_2 (accessed 20 August 2021)

426 Piepenburg, Matthew and Lott, Thomas, Signals Matter LLC (2021) *Social Unrest, The Historical Correlation between Financial Security and Social Stability. Paragraphs 1, 38, 42 and 45.* Published July 14 2020 by Signals Matter LLC, Piepenburg, Matthew and Lott, Thomas of Signals Matter LLC available at *https://www.signalsmatter.com/social-unrest/*

Signals Matter LLC https://www.signalsmatter.com/how-it-works/matt-and-tom/ (accessed 17 February 2022)

The World Values Survey website (2020) stated 'people's beliefs play a key role in economic development, the emergence and flourishing of democratic institutions, the rise of gender equality, and the extent to which societies have effective government'. They noted that their world cultural map, 'presents empirical evidence of massive cultural change and the persistence of distinctive cultural traditions' globally and that the latest questionnaire includes new topics as the issues of justice, moral principles, corruption, accountability and risk, migration, national security and global governance, that this 7th wave survey is also contributing towards monitoring the set of Sustainable Development Goals and the targets defined by the UN post-2015 agenda.427 Values matter. Signals matter.

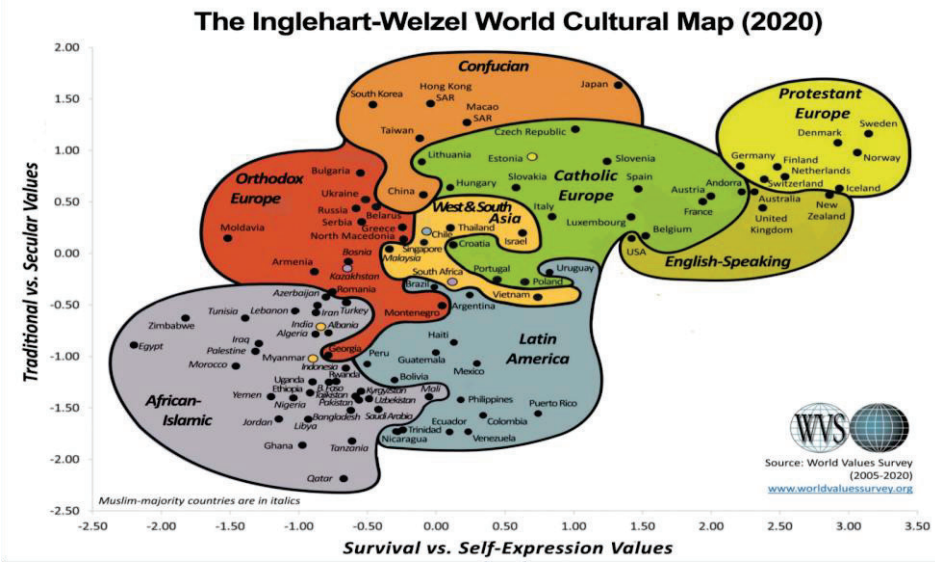


**Figure 4.3 Signals Matter, Values Matter, (2020) World Values Survey Association Inglehart-Welzel World Cultural Map**428

427 World Values Survey Association (2020) Website https://www.worldvaluessurvey.org/WVSContents.jsp (Accessed 10 August 2021)

428 World Values Survey Association (2020) Inglehart-Welzel World Cultural Map - World Values Survey 7 [Provisional version]. Source: http://www.worldvaluessurvey.org/ (23 February 2022) [Most up to date map]

There is always social unrest, human rights violations, every generation, and era experiences this. Look at Ukraine today, in 2022. My elderly in-law aunt reminded me of the blitz in World War 2 as a child, and how, even today, fireworks make her want to cower in fear and that is a future legacy for this generation of children in Ukraine, on top of everything else. And the same for children anywhere in a war zone today. Could AI predict social unrest? This can help in policy making.

Barrett, Philip., Appendino, Maximiliano., Nguyen, Kate., and de Leon Miranda, Jorge., (2020) index of social unrest is based on counts of relevant media reports and consists of individual monthly time series for 130 countries, available with almost no lag, and can be easily and transparently replicated. They state that answering questions about the relationship between social unrest and economic or financial outcomes necessitates data on social unrest which they argue wasn't readily available and note that social unrest has a natural connection to economic questions, as economic factors may contribute to social unrest.429 How can we use AI to predict social unrest? It may be possible now.

Rabie, Passant (2019) states that a team of researchers at University of Oxford, Boston University and University of Agder in Norway claim to have developed a new AI model that predicts human behavior, specifically, a scenario of social unrest. The team wanted to understand the social dynamics behind religiously motivated acts of violence and has created an AI system that mimics human religiosity, laying the groundwork for

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429 Barrett, Philip., Appendino, Maximiliano., Nguyen, Kate., and de Leon Miranda, Jorge., (2020) *Measuring Social Unrest Using Media Reports* Page 1. Published by the IMF https://www.imf.org/en/Publications/WP/Issues/2020/07/17/Measuring-Social-Unrest-Using-Media-Reports-49573?utm_medium=email&utm_source=govdelivery

psychologically accurate AI that can predict human behavior. The team designed algorithms that processed information in the same way that the human brain processes information, highlighting that their code is open source and transparent, the AI is oriented toward policy modelling.430 Could this AI become a mode to inform government economic policy?

Ireland was not without democratic challenges., “The troubles” as they are called, meant ongoing violence and deaths in the north, religious discrimination, pain on both sides of a religious divide, and across both sides of the border.

In terms of equal rights, women, including my late mother, were required to resign upon marriage in the Irish Civil Service. That marriage bar was removed in 1973. Single and married men were paid on two different salary scales at that time, for the same job. Things are much improved, the Equal Status Acts 2000-2018 (‘the Acts’) prohibit discrimination in the provision of goods and services, accommodation and education. Nine grounds of discrimination are gender, marital status, family status, age disability, sexual orientation, race, religion, and membership of the Traveller community. 431

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430 Rabie, Passant (February 26, 2019) Can we use AI to predict social unrest? Published by Science, Health and Environmental Reporting Program in the Arthur L. Carter Journalism Institute at New York University, USA https://scienceline.org/2019/02/can-we-use-ai-to-predict-social-unrest/ (accessed 11 August 2021)

431 Irish Human Rights and Equality Commission., (2021), *Equal Status Acts*, website paragraph 1. Irish Human Rights and Equality Commission, Dublin, Ireland https://www.ihrec.ie/guides-and-tools/human-rights-and-equality-in-the-provision-of-good-and-services/what-does-the-law-say/equal-status-acts/ (Accessed 17 August 2021)

**Figure 4.4 Irish Human Rights and Equality Commission., (2021), *Equal Status Acts*, website paragraph 1. Irish Human Rights and Equality Commission, Dublin, Ireland**

AI and ML use of financial data is well established in some areas, and I had seen reported instances of AI use in predictive tools in Justice although with a note of caution for example, the Council of Europe, European Commission for the Efficiency of Justice., (CEPEJ), (2018), Ethical Charter highlighted a case study where police archives data is used in ML predictive tools including in the UK, Durham Police archives.

> HART (Harm Assessment Risk Tool) was developed in partnership with Cambridge University and is now being tested in the UK. This technology based on machine learning was trained using Durham Police archives dating from 2008 to 2012. By learning from decisions made by police officers during this period, and whether or not certain suspects reoffended, the machine is expected to be able to assess the risk – low, medium or high – of suspects reoffending, based on around thirty factors, some of which are not related to the crime committed (for example, postal code and gender). 432

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432 European Union, Council of Europe, European Commission for the Efficiency of Justice., (CEPEJ), (2018), European Ethical Charter on the Use of Artificial Intelligence in Judicial Systems and their environment. Page 51. Published by CEPEJ, Strasburg, France at https://www.coe.int/en/web/cepej/cepej-european-ethical-charter-on-the-use-of-

Waardenburg, L., Sergeeva, A., & Huysman, M. (2018). Discuss new roles in predictive policing and argue that as well as critical debates on subjectivity of analytics, more attention should be paid to intermediaries, people in-between designers and users, as they may exert the most consequential influence on analytics outcomes, by further black-boxing the inherent inclusion of human expertise in analytics. 433 Important to keep this in mind reflecting on modes of governance with AI and by AI. Humans in the loop, a new paradigm shift in our democratic processes and institutions.

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artificial-intelligence-ai-in-judicial-systems-and-their-environment (accessed 15 September 2021)

433 Waardenburg, L., Sergeeva, A., & Huysman, M. (2018). Hotspots and blind spots: A case of predictive policing in practice. In C. Østerlund, M. Mähring, U. Schultze, K. Riemer, & M. Aanestad (Eds.), Living with Monsters? Social Implications of Algorithmic Phenomena, Hybrid Agency, and the Performativity of Technology - IFIP WG 8.2 Working Conference on the Interaction of Information Systems and the Organization, IS and O 2018, Proceedings (pp. 96-109). (IFIP Advances in Information and Communication Technology; Vol. 543). Springer New York LLC. https://doi.org/10.1007/978-3-030-04091-8_8 downloaded from Hotspots and blind spots: A case of predictive policing in practice — Vrije Universiteit Amsterdam (vu.nl) (accessed 18 September 2021). Pages 96 and 107.

Also: Lauren Waardenburg, Anastasia Sergeeva, Marleen Huysman. Hotspots and Blind Spots. Working Conference on Information Systems and Organizations (IS&O), Dec 2018, San Francisco, CA, United States. pp.96-109, 10.1007/978-3-030-04091-8_8. hal-02083594

Also: Waardenburg, Lauren; Sergeeva, Anastasia; Huysman, Marleen Hotspots and blind spots Pages 96 and 107. published in Living with Monsters? Social Implications of Algorithmic Phenomena, Hybrid Agency, and the Performativity of Technology - IFIP WG 8.2 Working Conference on the Interaction of Information Systems and the Organization, IS and O 2018, Proceedings 2018 DOI (link to publisher) 10.1007/978-3-030-04091-8_8 document version Publisher's PDF, also known as Version of record document license Article 25fa Dutch Copyright Act. Accessed Hotspots and Blind Spots (vu.nl) (Accessed 23 February 2022)

But when watching the news today, EU rights can't always be taken for granted as there in perpetuity. McLaughlin, D., (2021) reported in the Irish Times, 'EU tells Hungary to quash 'disgraceful' anti-Lesbian, gay, bisexual and transgender (LGBT) law, reporting that critics of Orban government want EU funds withheld over graft and rule of law concerns.'434 This article was also published by the national broadcaster Radio Teilifís Eireann (RTE). Values and rights in a democracy, taken for granted by so many today, are not there globally and for many in the EU were not always there. They can be lost in a heartbeat. This is also true globally.

### 4.2.3 Democratic Institutions and Democratic Values in Society

What if you had no voice? Afghanistan is a country where history is repeating itself for men, women, and children today, social unrest, authoritarian rule. Watching the unfolding situation in Afghanistan.

> "KABUL—Taliban leaders have publicly pledged to be magnanimous in victory, assuring government officials, troops and the people of Afghanistan that they have nothing to fear as ever larger swaths of the country fall under their control
> Afghans pouring into Kabul and those still in Taliban-held areas say they have witnessed unprovoked attacks on civilians and executions of captured soldiers. In addition, they say, Taliban commanders have demanded that communities turn over

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434 McLaughlin, D., Irish Times, (2021), '*EU tells Hungary to quash 'disgraceful' anti-LGBT law*.' Published by McLaughlin, D., Irish Times, Dublin, Ireland. Wednesday, Jul 7, 2021, 09:53 Updated: Wednesday, Jul 7, 2021, 17:28 at https://www.irishtimes.com/news/world/europe/eu-tells-hungary-to-quash-disgraceful-anti-lgbt-law-1.4613912 (accessed 23 February 2022)

unmarried women to become “wives” for their fighters—a form of sexual violence, human-rights groups say.
The U.S. Embassy in Kabul said Thursday that it had received reports of the Taliban executing members of the Afghan military who had surrendered. “Deeply disturbing & could constitute war crimes,” the embassy said on Twitter.435

And:

“In early July, as Taliban insurgents were seizing territory from government forces across Afghanistan, fighters from the group walked into the offices of Azizi Bank in the southern city of Kandahar and ordered nine women working there to leave.
The gunmen escorted them to their homes and told them not to return to their jobs. Instead, they explained that male relatives could take their place, according to three of the women involved and the bank's manager.”436

And:

“Dozens of young girls were buried today at a desolate hilltop cemetery in Kabul, a day after a secondary school was targeted in the bloodiest attack in Afghanistan in over a year.
A series of blasts outside the school during a peak holiday shopping period killed more than 50 people, mostly female students, and wounded more than 100 in Dasht-e-Barchi, a west Kabul suburb populated mostly by Hazara Shiites.
Last week the school students had protested about a lack of teachers and study materials, … "But what they got (in return) was a massacre." 437

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435 Saed, Shah., Wall Street Journal (2021) Afghans Tell of Executions, Forced ‘Marriages’, in Taliban-Held Areas Published online by the wall Street Journal, available at https://www.wsj.com/articles/afghans-tell-of-executions-forced-marriages-in-taliban-held-areas-11628780820 (Accessed 15 August 2021) [Listening time 1.48 minutes]

436 Raidió Teilifís Éireann (RTE)., Accreditation: Reuters, (2021), *Afghan women forced from banking jobs by Taliban fighters* Reuters, RTE, Ireland Updated / Friday, 13 Aug 2021 12:54 Paragraphs 1 and 2, available at https://www.rte.ie/news/world/2021/0813/1240679-afghan-womens-rights/ (accessed 23 February 2022)

437 Raidió Teilifís Éireann (RTE)., Accreditation: AFP/Reuters, (2021), *Schoolgirls buried after Afghanistan school massacre*, Paragraphs 1, 2, and 3. RTE, Ireland, available at https://www.rte.ie/news/world/2021/0509/1217861-afghanistan-explosion-latest/ Updated / Sunday, 9 May 2021 15:34 (accessed 23 February 2022)

I have the right to Vote, to participate in Public Policy, to pay taxes (to work), to travel, to marry whom I choose. In July 1990 my husband's country had an attempted coup. A democracy and a commonwealth country. 9 short days. But, living it, daily wondering about what was going to happen to his family. His ancestral family had to leave Portugal in the 1930s. They were given a choice to leave but minus most possessions. This was a business family. His maternal great grandmother, another business family, was of Jewish background, also relocated.

Lewin, Kurt., (1997), a German of Jewish faith, a refugee scholar in the USA is an influential thought leader of change management practices and in his works also highlighted the importance of democratic values, as noted in his article on the special case of Germany where he considers the means by which Germany's authoritarian culture (at that time) could be replaced with a culture of democratic values; "change in culture requires the change of leadership forms in every walk of life at the start, particularly important is leadership in those social areas which are fundamental from the point of view of power" (page 55).438

He is the pioneer of the Action Research approach, which Burns, B., (2004) notes draws on other areas of Lewin's work including Field Theory, the impact of group behaviour, the interactions and forces and interactions that affect group structures and also

438 Lewin, Kurt., (1997), *The Special Case of Germany (1943).* Pages 44 and 47. Published by Lewin, Kurt., in American Psychological Association, Washington DC, USA. In K. Lewin, *Resolving social conflicts and field theory in social science* (pp. 40–47). https://doi.org/10.1037/10269-003 available at https://content.apa.org/record/1997-97489-003 (accessed 23 February 2022)

modify individual behaviour; Group Dynamics, which emphasises that the focus of change must be at group level and focus on group norms, that changing individual's behaviour is fruitless, as individuals in isolation are constrained by group pressures to conform, also noting that Lewin describes Action Research as a two-pronged process, which allows groups to address three questions, relating to their present situation, the dangers and what organisations, institutions and individuals should do. He outlines Lewin's 3-Step model of organisational change, "Unfreeze, Change, Refreeze", noting that underpinning Lewin's work was a strong moral and ethical belief in the importance of democratic institutions and democratic values in society.439 For example, the EU.

The EU is a democratic society run by democratic institutions. The University of Latvia, (2021) biography of Jean Monnet, credited with founding the EU, states he was 'born in France, in 1888 into a family of brandy merchants', that 'after the Second World War, he was made responsible for the economic recovery of France, that his solution was a vision for a democratic Europe. He recommended that France and Germany be bound in a common undertaking in which their neighbours could join, creating a Europe-wide area of prosperity and peace and that in May 1950, his suggestion to the French foreign minister Robert Shuman the idea of pooling together the German and French coal and steel production', led to the establishment of the *European Coal and Steel Community'*. 440

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439 Burnes, Bernard., (2004), *Kurt Lewin and the Planned Approach to Change: A Re-appraisal.* Pages 981, 983 and 984, Published by Burnes, B., in the *Journal of Management Studies* Pages 977-1002, Volume 41: Issue 6 September 2004 available at https://onlinelibrary.wiley.com/doi/epdf/10.1111/j.1467-6486.2004.00463.x (accessed 23 February 2022)

440 University of Latvia website., (2021) Jean Monnet, Biography https://www.lu.lv/en/cets/jeanmonnet/jmbiography/

The EU has transformed the landscape of Europe, economically, culturally, and socially, for its citizens, and globally also in world trade, monetary union, monetary stability, freedom, security and justice, sustainability, financial accounting, and other policy, run by democratic institutions working with national institutions of EU member states, and globally.

Fontaine, P., (1988) stated a quotation from Henri-Frederic Amiel441, runs through Monnet's writings like a leitmotif: the quote being "Each man's experience starts again from the beginning. Only institutions grow wiser: they accumulate collective experience; and, owing to this experience and this wisdom, men subject to the same rules will not see their own nature changing, but their behaviour gradually transformed". Fontaine also

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441 Amiel. Henri-Frédéric., Journal Commentator and Translator, Ward. Mrs. Humphrey., July, 2005 Amiel's Journal – Gutenberg EBook #8545. Page 157.

This file was first posted on July 21, 2003 Last Updated: October 31, 2016 Character set encoding: UTF-8 Text file produced by Charles Aldarondo, Tiffany Vergon, Tonya Allen, Charles Franks and the Online Distributed Proofreading Team. HTML file produced by David Widger. Available at https://www.gutenberg.org/files/8545/8545-h/8545-h.htm (Accessed 24 February 2022)

"Each man begins the world afresh, and not one fault of the first man has been avoided by his remotest descendant. The collective experience of the race accumulates, but individual experience dies with the individual, and the result is that institutions become wiser and knowledge as such increases; but the young man, although more cultivated, is just as presumptuous, and not less fallible to-day than he ever was. So that absolutely there is progress, and relatively there is none. Circumstances improve, but merit remains the same. The whole is better, perhaps, but man is not positively better—he is only different. His defects and his virtues change their form, but the total balance does not show him to be the richer. A thousand things advance, nine hundred and ninety-eight fall back, this is progress. There is nothing in it to be proud of, but something, after all, to console one."

Note: This is a translation and the quote by Fontaine Pascal (1988) is adapted. Other similar adaptations with slightly different phraseology are noted in other documents. This was a translation that seemed to capture the original words.

acknowledges the "pre-eminent role of the European Parliament and the Commission in the attainment of targets liable to encounter resistance at national level".442

### 4.3Financial Accounting, a Powerful Global Economic Language

Financial accounting is a global language of commerce. Someya, Kyojiro (1989) states Japan's rise from a feudalistic economy to a position as a leading industrial power is a result, in part, of two revolutionary changes in its accounting structure, the first in the late 1800s, the move to double-entry accounting, and the second being the change from stewardship orientation to investor orientation for financial reporting, also noting that any analysis of accounting must include the economic, political and diplomatic environments in which it is practiced.443 The EU is harmonising financial accounting practices and is currently introducing European Public Sector Accounting Standards (EPSAS) which, in time, all member states will be required to implement. The EU is also setting EU AI standards.

FATF (2020) "Countering terrorist financing remains one of the FATF's main objectives. A fundamental pillar of this work is ensuring that jurisdictions understand and are able to assess their terrorist financing risks." The FATF "supports global initiatives on the countering of terrorist financing" such as the 'No Money for Terror' conferences.

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442 Fontaine, Pascal., (1988) Jean Monnet, A Grand Design for Europe Page 31, Published by European Union, European Commission, Luxembourg, ISBN 92-825-8920-X, available at http://aei.pitt.edu/4561/1/4561.pdf

443 Someya, Kyojiro., (1989), *Accounting Revolutions in Japan* Page 1, Published By: The Academy of Accounting Historians, The Accounting Historians Journal Vol. 16, No. 1 (June 1989), pp. 75-86 (12 pages)

> In November 2019, at the second "**No Money for Terror**" conference in Melbourne, Australia. The President gave a keynote speech on the topic of emerging technologies and terrorist financing risks; and heard the discussions on enhancing the role of public-private partnerships in combating terrorist financing, preventing the abuse of non-profit organisations for terrorism purposes and providing global response to kidnapping for ransom and terrorist financing.

"However, the FATF Standards recognise that not all non-profit organisations carry terrorist financing risk. The global COVID-19 crisis highlights how important it is to ensure that legitimate charitable activities are not unnecessarily delayed, disrupted or discouraged".444

The FATF President: Liu. Xiangmin., (2020) stated the global COVID-19 pandemic led to unprecedented and devastating challenges, claiming lives, and causing catastrophic economic disruptions, that in this climate, the FATF continued to deliver its crucial work, including highlighting new threats and vulnerabilities emerging during the crisis.445 Their standards must be adhered to by member countries.

FATF's (2020) annual report references the FATF new binding international standards for virtual assets, referencing virtual asset service providers (VASPs) and the cryptocurrency industry.

> "In June2019, the FATF finalised binding international standards for virtual assets and virtual asset service providers (VASPs), which apply to the fast expanding cryptocurrency industry. An effective, global implementation of the FATF's

444 FATF., (2020), FATF Annual Report 2019, 2020. Pages 19 and 20. Published by FATF/OECD, Paris, France, available at: https://www.fatf-gafi.org/media/fatf/documents/brochuresannualreports/FATF-annual-report-2019-2020.pdf accessed on 10 August 2021) [Also used 19 (Wildlife Picture) later]

445 FATF., FATF President: Liu. Xiangmin., (2020), Pages 6 and 7. FATF Annual Report 2019, 2020. Published by FATF/OECD, President: Liu. Xiangmin., Paris, France, available at www.fatf-gafi.org/publications/fatfgeneral/documents/annual-report-2019-2020.html (accessed 24 February 2022) (President 2019-2020)

> revised standards will ensure that virtual asset technologies and businesses can continue to grow and innovate in a responsible way, and it will create a level playing field. The FATF has maintained its focus on this area under the Chinese Presidency.

And found that "the public and private sectors have made progress in implementing the revised FATF Standards on virtual assets" that "stablecoins (their value is meant to be stable relative to that of an underlying asset or benchmark) have the potential to spur financial innovation and efficiency and improve financial inclusion" and the annual report also noted that, "criminals involved in the illegal wildlife trade are misusing the legal wildlife trade as well as other import-export type businesses, as fronts to move and hide illegal proceeds from this crime and they are increasingly using online marketplaces and mobile and social media-based payment systems, located in third countries, to facilitate movement of proceeds from wildlife crimes." But they caution that

> "Despite the significant criminal gains involved, the FATF report concludes that countries and private sector are not prioritising efforts to trace and combat financial flows from this trade in line with risk. To combat the financial flows from the illegal wildlife trade, countries should as a priority:
>
> - Identify and assess their money laundering risks relating to the illegal wildlife trade.
> - Ensure that national laws and powers for law enforcement allow authorities to go after the finances of wildlife traffickers, and to pursue financial investigations.

The FATF noted that their online FATF training delivery platform and its first e-learning course, fills a gap in the FATF's training offerings training at the introductory level for newcomers to the international AML/ CFT environment. The course is described as:

> "Aimed at government officials from the FATF Global Network, and ensures that learners have a basic overview of the FATF's mandate, FATF processes such as the mutual evaluation process. It also provides high-level, plain language explanations of each Immediate Outcome and Recommendation, breaking down barriers to entry into the complex world of the FATF Global Network. The course was designed with accessibility as a primary goal to maximise potential audience reach." …….

And the report noted "The new e-learning platform will allow the FATF to gradually roll out more basic, intermediate and advanced level trainings for the FATF Global Network. The e-learning initiative of the Chinese Presidency will ensure that the FATF Global Network receives more and better training on the FATF standards going into the future, wherever learners are located" 446

Could there be a role for AI and the FATF Standards and Education and Awareness Raising? AI augmented education for many, on money matters.

### 4.3.1 Money Matters Ethics the Glue that Binds

When I initially considered my research approach, I reflected on how international financial accounting standards are a global and harmonising language, and how international financial organisations including the IFAC who have set global public sector accounting standards and the International Organisation of Supreme Audit Institutions (INTOSAI) who work with Supreme Audit Institutions globally to promote their standards, independence, the IMF, the FATF the global money laundering and terrorist financing

446 FATF., (2020), FATF Annual Report 2019, 2020, Pages, 13, 14, 22, 23, and 47. Published by FATF/OECD, Paris, France, available at: https://www.fatf-gafi.org/media/fatf/documents/brochuresannualreports/FATF-annual-report-2019-2020.pdf accessed on 10 August 2021)

watchdog, the World Bank, OECD, UN, EU and other organisations foster global governance, global diplomacy, transparency, standards and ethics, and in response to a request by my Department, considered how this related to the work of my own Department as part of my ethics and AI research through considering Ireland's national policy cycle, financial structures, and supporting documents, ethics governance, corporate governance, and citizen voice.

**Figure 4.5 FATF (2021) Money Laundering is not a victimless crime, YouTube, at** Money laundering is not a victimless crime - YouTube **(accessed 18 December 2021)**

Saunders, Mark. N. K., Lewis, Philip., Thornhill, Adrian., (2019), outline that there are three Cycles of the Action Research Spiral identifies Content and Purpose leading to three or possibly more cycles of, Diagnose, Plan Action, Take Action, and Evaluate Action, that Action Research has implications beyond the research project and that there are also likely to be consequences for organisational development and culture change. They note the number of cycles should be decided upon and state "where the practical, as well as political concerns, have been properly anticipated and evaluated in terms of a feasible design, Action Research has the potential to offer a worthwhile and rich experience for those involved.447 I completed 6 cycles over one year in my Action Research.

**4.4 The Action Research Cycles**

The Action Research cycle stages are set out in more detail as eight stages by (Robson, Colin. 2011) as set out below (noted as slightly modified from Bassey, 198, pp, 94-5). 448I used these eight stages and the questions to guide my thinking and work for each of the Action Research cycles undertaken.

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447 Saunders, Mark. N. K., Lewis, Philip., and Thornhill, Adrian., (2019) *Research Methods for Business Students* Eighth Edition. Pages 203 and 204. Published by Saunders, Mark. N. K., Lewis, Philip., and Thornhill, Adrian., Pearson Ltd, Harlow, UK ISBN: 978-1-292-20878-7

448 Robson, Colin., (2011) Third edition *Real World Research.* Page 190. Published by Robson, C., Wiley and Sons Ltd, Printed by TJ International Ltd, Cornwall UK. ISBN 987-1-4051-82409.

*Define the inquiry:* What is the issue of concern? What research question are we asking? Who will be involved? Where and when will it happen?

*Describe the situation:* What are we required to do here? What are we trying to do here? What thinking underpins what we are doing?

*Collect evaluative data and analyse it.* What is happening in this situation now as understood by the various participants? Using research methods, what can we find out about it?

*Review the data and look for contradictions.* What contradictions are there between what we would like to happen and what seems to happen?

*Tackle a contradiction by introducing change.* By reflecting critically and creatively on the contradictions, what change can we introduce which we think is likely to be beneficial?

*Monitor the change.* What happens day by day when the change is introduced?

*Analyse evaluative data about the change.* What is happening in this situation now – as understood by the various participants – as a result of the changes introduced? Using research methods what can we find out about it?

*Review the change and decide what to do next.* Was the change worthwhile? Are we going to continue it in future? What are we going to do next? Is the change sufficient?

**Figure 4.6 "Stages of Action Research" by (Robson, Colin. 2011) Page 190**

Saunders, M. K. N., Lewis. P., and Thornhill, A., (2019) also state "Action research approach may mean you have an initial literature review to locate your study within existing knowledge, but that it is likely that the researcher will need to introduce further strands of literature later as themes emerging are interpreted".449

My research proposal for funding was provided to my Assistant Secretary. I was asked to tailor to something of greater relevance to the Department, but not as a condition of the funding approval. I scoped my research to incorporate consideration of our policy role both internally, and as a major approving authority with accountability for local government, national agencies, other bodies, policymaking across Ireland and consideration of public policymaking globally with Irish financial data reported to the EU

449 Saunders, Mark. K. N., Lewis. Philip., and Thornhill, Adrian., (2019), *Research Methods for Business Students.* Eighth edition. Pages 723-724. Published by Saunders, Mark. K. N., Lewis. Philip., and Thornhill, Adrian., Pearson Ltd. Harlow, UK ISBN: 978-1-292-20878-7

also globally via the IMF financial statistics. Ireland has a harmonized ethics framework, a national public service strategy, corporate governance structures, but a fragmented approach to financial accounting, limited information on AI governance, circulars supporting government accounting financials, and policy, and manual processes for all of this. So, I set out as part of my research to scope, an action research section where I would focus on whether AI financials, would enhance the Irish Public Policy cycle, Action Research Cycle 1.

## 4.5 Cycle 1: Teasing out the Issues: Getting the finger on the pulse

### 4.5.1 Public Spending Code, National Public Policy, no AI

*Define the inquiry:* What is the issue of concern? What research question are we asking? Who will be involved? Where and when will it happen?

The issue of concern, and the subject of this Action Research, was the absence of documentation supporting compliance with PSC, a nationally fragmented approach to the delivery of a major capital expenditure programme, many IT systems, and a lack of understanding of the accountabilities of and compliance with the new updated PSC guidance.

Nine years earlier I had headed a newly established team when this PSC national policy was first introduced in 2013 and I had set up procedures including self-assessment of compliance and an integrated training strategy for our Department our Agencies and

Local Government. The reports were certified by our Accounting Officer and publicly available450.

The processes appeared to have been successful, had the support of senior management yet they ceased after two reports. I was interested to understand why policy and governance processes introduced and certified by top management, subsequently failed to progress, in an environment where there had been so much staff engagement, agreement and self-assessment of compliance. Staff and institutional perceptions needed to be understood.

In the intervening years, I moved to head of ICT strategy (1.5 years), later head of ICT Acting Principal Officer (2.5 years). When that Acting post ceased in July 2020, I moved to the Department strategic policy unit.

This research question is, 'How does and AI governance framework benefit public policy?' For cycle 1 the Department Public Spending Code (PSC) are primarily managed in a Build to Share (BTS) records management system and managed in the day to day using email and attachments. Ireland's capital investment management processes are noted by the OECD, IMF, and EU as fragmented structures being used for delivery of national policies, across public entities and tiers of governance. I examined how an AI governance

450 Department of Environment, Community and Local Government., (2015), Public Spending Code Quality Assurance Report the Department of the Environment, Community and Local Government, Agencies and other Bodies under its aegis for the year ended 31 December 2013 Available at http://www.housing.old.gov.ie/corporate/compliance/public-spending-code-quality-assurance-report-2013 (accessed 11 August 2021)

Department of Environment, Community and Local Government., (2017), *Public Spending Code Quality Assurance Report 2014 for the Department of Environment, Community and Local Government* http://www.housing.old.gov.ie/corporate/compliance/public-spending-code-quality-assurance-report-2014 (accessed 11 August 2021)

framework might augment and harmonize these structures which involve the EU, citizens, ministers, public servants, consultants, the construction and other sectors, approving/spending billions in the policy process.

The people and entities involved in Cycle 1 were (1) my colleagues on the Strategic Policy Team, (2) the Department of Expenditure and Reform (DPER) National Infrastructure Office (NIO), (3) DPER Robotics Automation Process (RPA) team, (4) a number of Principal Officers, Heads of Business Units approving large PSC projects in my Department, many in excess of €100m, also large capital or current expenditure programmes, and EU funding (5) 3 Agencies under Department aegis, Irish Water, the Land Development Agency and the National Oversight Audit Committee (NOAC) the Local Government agency responsible for reporting on PSC compliance, our Department has a 'parental' role in sectoral policy.

In November 2020, I set out to governance map my Department's PSC implementation procedures with a view to assessing compliance with same, effectiveness of same, and recommendations for implementation, in my role in the Strategic Policy Unit of my Department, the assignment commenced after my doctorate submission was approved and was only part of this research, a key part in that, as an outlier in AI terms I felt that this manual policy making process could be improved in so many ways through AI, financial and ethics awareness.

### 4.5.2 A Key Policy Cycle Failed

*Describe the situation:* What are we required to do here? What are we trying to do here? What thinking underpins what we are doing?

I first sought to establish what was being reported nationally in terms of PSC governance comments and compliance in the public domain as I wanted to understand how a key policy cycle seemed to have failed in terms of its use. My initial desktop review report noted that:

1. Everything I saw in operational terms was manual for PSC appraisal and links with corporate governance documents nationally were not clear.
2. There was, a national €116bn budget commitment for capital projects and programmes over a period of 10 years part of a longer-term strategy to 2040 where projects and programmes over €20m were identified in a public document called Project Ireland 2040 tracker. The data was supported by dashboards and a related Geographic Information System (GIS) mapping tool was also available. The tracker's excel worksheets seemed to be incomplete when compared with the GIS mapping tool and NOAC schedules of local government approved projects and programmes.
3. The European Commission had engaged Ernst and Young consultants on behalf of DPER, to review delivery of national capital infrastructure. This report followed on from previous reports, an OECD review and recommendations in 2017, an IMF review in 2017 in which made recommendations in respect of the Project Ireland 2040 tracker. The EY report again referenced the fragmented approach to capital project delivery across Ireland, originally noted in the OECD and IMF reports.
4. The Department Organisational Capability Review (OCR) 2021 had noted that Evidence-based policy was an organisational strength, but that the Department has to ensure its governance arrangements remain robust to ensure high quality

oversight and monitoring of those tasked with delivery across all its policy areas, and in respect of PSC had recommended that the Department review its appraisal capacity and approach across the organisation in order to ensure that the existing approach would be appropriately aligned and resourced to meet likely future requirements, to be mindful that appraisal and evaluation capacity needed to be strengthened, and to strengthen internal collaboration. 451

5. I also noted Ireland's Supreme Audit Institution Financial Management Maturity Model and its references to the PSC and to Artificial Intelligence. I asked whether an assessment using that model had been done in relation to PSC sections, and was advised by the Strategic Policy Unit, that an assessment was not undertaken in this unit and did not appear to have been undertaken by the Department yet. The PSC question asked was "How are investment appraisal and project management processes used to evaluate costs and benefits and to inform all key policy, operational and investment decisions? 452
6. Nationally there was clear and comprehensive documentation showing how to implement PSC processes available online for all, although I noted the guidance

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451 DPER, (2021), *Organisational Capability Review Report Department of Housing, Local Government and Heritage,* Pages, 2, 4-6, Published 13 April 2021 by DPER, Dublin, Ireland, Available at. https://www.gov.ie/en/publication/dbae7-organisational-capability-review-report/ (accessed 15 August 2021) (Last updated 13 April 2021)

452 Office of the Comptroller and Audit General (OG&AG) (2018) Financial management maturity model Page x, OG&AG, Dublin, Ireland, https://www.audit.gov.ie/en/find-report/publications/special%20reports/special-report-101-financial-management-maturity-model-a-good-practice-guide.html (Accessed on 11 August 2021) Report at https://www.audit.gov.ie/en/find-report/publications/2018/special-report-101-financial-management-maturity-model-a-good-practice-guide.pdf

was all manual, any templates provided were in the guidance documents or provided on excel with no suggestion of AI, RPA, Blockchain systems to support the Policy tools. I noted the PSC had been re-launched in 2019 as an updated version[453], but that some of the PSC guidance documents was old for example, Regulatory Impact Analysis (RIA) guidance is dated June 2009. I was aware of the EU RIA AI costing templates. DPER had advised me upon my earlier enquiries that the Current Expenditure Policy and Quality Assurance Policy guidance were being worked upon in 2021.

7. I reviewed the PSC governance frameworks in public sector corporate governance frameworks, including our Department Corporate Governance Framework, nationally, Public Financial Procedures and government accounting circulars, national and EU ethics standards.
8. I followed up on a project I had commenced as head of ICT to introduce Robotics Processes Automation in the management of all grants issued through our Department to Local Government and our Agencies.
9. I reviewed internal documents, from Internal Audit PSC compliance comments and the Corporate Risk register PSC risk assessment in 2019 which emphasised individual accountability for PSC compliance but made no reference to financials,

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453 Ireland, DPER., (2019), Minister Donohoe publishes "The Public Spending Code: A Guide to Evaluating, Planning and Managing Public Investment" Press Release published by DPER, Dublin, Ireland, Available at https://www.gov.ie/en/press-release/d8421f-minister-donohoe-publishes-the-public-spending-code-a-guide-to-evalu/ (accessed 05 March 2022) Published on 11 December 2019 Website last updated on 11 December 2019

ethical risk, budget management, quality assurance obligations, or what controls were needed to demonstrate individual accountability.

10. I noted that since 2014, because there were no quality assurance reports and accompanying schedules of projects/programmes there was no direct link of PSC with Department annual, multi-annual (three year) budget setting processes.
11. Following initial meetings and review of three existing strategic assessments, I reviewed a strategic assessment appraisal for one project where expenditure was more than €100m to develop a template based on the requirements set out in the PSC guidance, including the approvals processes both internally and with DPER processes as part of this initial review. The intention was to provide for colleagues on the team to use to review future assessments to bring consistency to strategic appraisals, then to extend its use to all, following agreement of the template with DPER. This is an approach DPER uses for other documents to support delivery. I prepared the Strategic Assessment Report (SAT) template and the initial governance mapping document.

The initial governance mapping was also to understand the current position of the PSC contextualised in national corporate documentation. A SAR template and initial governance mapping report which we agreed as an 'Aide memoire' were provided to my Head of Business Unit. And we agreed what needed to be discussed in the meetings including asking for their views on making financial appraisal easier to use.

I provided the strategic assessment report (SAR) which included commentary on all strategic policies required to be assessed by an approver reviewing, smart technology, electric vehicles, carbon, climate and roads infrastructure, social and green considerations

re procurement, financial and economic commentary. I was advised that although all inclusions were valid, the SAR was not to reflect a section listing national policy / leaving space for other policy and comment on the presence or absence of policy, as the line divisions decision solely make the decision to include/exclude any such policy, a specific example was that there was no detail for electric vehicle chargers in a major housing scheme. I was then asked to refocus on numbers only, to develop the template in relation to financial and economic appraisal calculations solely, to focus on financial appraisal and economic appraisal numbers and financials as that was particularly weak and the area needing support So, in addition to meeting colleagues, I also commenced engagement with DPER RPA with the approval of my Line Manager.

12. I spoke with people to understand what their understanding was in relation to PSC processes and accountability internally and nationally to ascertain their understanding of PSC compliance, of PSC and financial management, and their own roles in PSC and accountabilities.

At each meeting I explained my role, that I was not auditing, reviewing, or making assessment of existing/past processes, that I wanted to understand what PSC meant to them in terms of their accountabilities today, what issues, challenges they were experiencing, what PSC guidance they were using, whether they were familiar with Public Financial procedures, what PSC training had been provided, and asked them to send me details of the projects or programmes they were accountable for, initially for instances where the Strategic Policy team would be needed to undertake an appraisal in 2021, to determine what records were being maintained. I asked about existing IT systems and their views as to whether I should contact the DPER RPA team about automation in relation to financial

appraisal, specifically exchequer funds, with a view to seeing if there was an easier way to deliver PSC exchequer financial appraisal.

I asked my Assistant Secretary if he wished me to keep him briefed on progress. I'd shared the outline with my line manager and my previous Assistant Secretary in Q4 of 2020 so I shared the wording about the research which had been agreed by the Department for the Swiss School of Business Research (SSBR) use on their website.

I received no comment and later was asked to confirm in writing that I would be completed with the doctorate within the second term as my last funded term. And it made me begin to wonder about whether there was management support for RPA and Blockchain for grants and exchequer appraisal.

### 4.5.3 Fragmentation and Confusion Reigns

> *Collect evaluative data and analyse it.* What is happening in this situation now as understood by the various participants? Using research methods, what can we find out about it?

I met with a number of Department Principal Officers, two key Agencies, the Department of Public Expenditure and Reform National Investment Office, experts in ICT in the Irish ICT managers network of which I am Chair, the Chief Executive of PeakConnexxion Ltd who coaches Principal Officers in my Department, my strategic policy team colleagues, another Government Department who appeared to be more advanced in their public reporting of PSC and delivery, reporting on these meetings in a detailed report with recommendations. The headings for same are set out in the figure below.

The meetings were held. In the discussions it became clear that while a lot of good work was being done, nothing was being documented, there was also a lack of awareness of the updated PSC, and because of Project Ireland 2040, some colleagues and Agencies appeared to understand that current expenditure no longer fell within the remit of the PSC. Many were unaware of the reporting and publishing requirements. Nobody had received training in PSC processes. It proved difficult to obtain assurances for annual PSC compliance returns relating to Agencies. The PSC quality assurance reports for the local government sector were available and more recent than internal project expenditure data. The benefit of cross-divisional funding project teams was acknowledged but seemed to be proving difficult to implement. Engagement with DPER NIO was fragmented and learnings were not shared with other Divisions internally. There was a willingness to share this information verbally in meetings because colleagues understood the governance mapping role and the desire to see how we could improve processes.

There was also a lack of awareness of the financial governance documents, Public Financial Procedures (the Blue Book), Circular 13/2014 *Management of and Accountability for Grants from Exchequer Fund,* government accounting circulars, the potential for AI to support and improve appraisal processes. In general, it was noted that people were doing their best to deliver government policy and that the PSC by its manual nature was difficult and time-consuming to implement, and sometimes unnecessary. PSC appraisal appeared to not be needed because of government decisions, but people felt that appraisals still needed to be done as if those decisions weren't in place. Much of what was being said suggested PSC was not embedded into everyday documented practices, and the absence of an advisory and co-ordinating unit was evident.

The Chief Executive of PeakConnexxion Ltd who has the contract for coaching Principal Officers in my Department, was provided with a copy of the initial doctorate brief and as part of my coaching tripartite, a constructive process by which line managers meet with the new Principal Officers and discuss individual/general coaching needs, the issue of reporting difficult, challenging messages was discussed and advice provided including observations on Professional and Technical staff (includes accountants) and a general view of difficulties they experience moving up the ranks. My line mangers noted that I needed to become comfortable in the 'grey' space and I needed to balance delivery of a project in a way that helps the organisation but recognises the political context within which we operate, focusing on the eventual outcome rather than the purist, technical detail, that I could achieve the same outcome by communicating in a positive, constructive written and verbal way.

It was stated that while not singling them out, but because of the comfort that Professional and Technical grades, have with that precision and rigour, there is a piece about remembering people are employees of the organisation and work for the Minister and when we have difficult messages to give, your job is not to destroy the organisation by the way you deliver them, that your job is to try to figure out a way to effect change and bring change to how things are done in a constructive and positive way remembering you are an employee of the Minister. It was noted that there is a piece there as well for all of us and that in a particular role or function, it may be easier not to have to deal with those challenges, but the higher up you go, you are the person who must deal with them.

It was also stated by way of coaching example that the Head of the Internal Audit Unit often has difficult messages and findings in reports that there are ways of reporting,

not putting something in writing, and don't completely destroy a department, and create a huge problem for a section of the organisation and you still achieve the same outcome at the end of the day, and that the focus should be on the outcome not the detail of the findings and that general principle applies to all of us to be very focused on the outcome, rather than the rigour and holding our position on things, that this can be more of a struggle for professional and technical grades as they move up through the ranks, something the (name withheld) has seen in the past.

The coaching made me think about ethical obligations, and how AI augmented financials could help PSC financial appraisal for all stages of the policy cycle. I thought to introduce rigour by means of AI augmented, PSC financial appraisal.

Eolas magazine editorial (2018), stated in respect of the National Development Plan (NDP), that prioritisation for decisions was not required under the NDP investment of €116 billion including €91 billion of Exchequer funding and €25 billion of investment from State-owned enterprises, that one criticism of the latest NDP is that while the majority of its predecessors were required, as a condition of EU funding, to provide evidence for prioritisation decisions, it does not.

In other words, the 2018 plan fails to utilise evidence-based processes to demonstrate that priority investments will yield the optimal socio-economic and environmental return. Previously, a review process was also incorporated to ensure that decisions could be revised, thereby ensuring value for money. Such a process also meant that, in spite of changing political tides, prioritisation remained in place as per the evidence and, overall, the capital investment plan remained relatively stable regardless of which party was in office".

In the article, the NDP 'big ticket' priorities were identified as set out below.

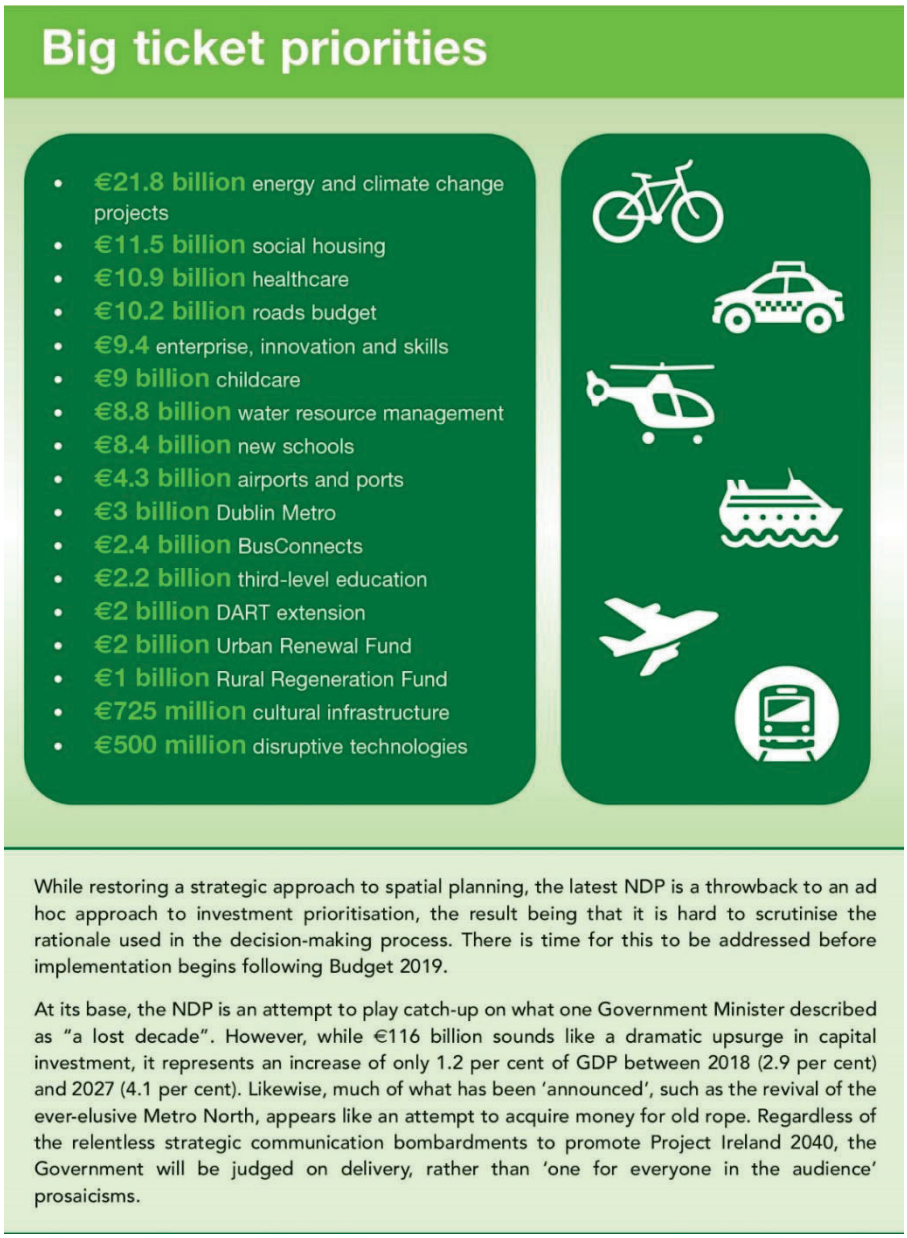


**Figure 4.7 EOLAS magazine, (2018) *The National Development Plan in Brief,* €116 billion big ticket priorities**

But with a very strong caveat about ad hoc investment prioritisation. 454 The PSC remains a primarily manual process. This was a place I could focus on, AI, RPA, and PSC financial appraisal.

My strategic policy team colleagues involved in appraisal review and recommendations to accept/reject a project, considered there were significant weaknesses in appraisals received for review, which should not have happened, and that Strategic Assessments submitted highlighted that economic and financial appraisal appeared to be only supporting policy decisions that had already been made, and not genuine assessment of options. The SAR should not present a 'fait accompli' with planning permission granted.

They also noted challenges in relation to financial flows, that without a firm understanding of all financial flows the Department, other Departments', Agencies, local authorities, and consultants, approving Department divisions cannot, conduct a robust financial and economic analysis, also that, as quality assurers, it would be difficult to sign off on a mixed tenure appraisal, if the financial flows described in the appraisal are non-definitive in important respects. AI and RPA in financial appraisal, would bring rigour to financial appraisal and was an area in which I could support my colleagues.

I provided the initial governance mapping 'Aide Memoire' document to my Line Manager for comment and sought to expand to capture all relevant public financial data for

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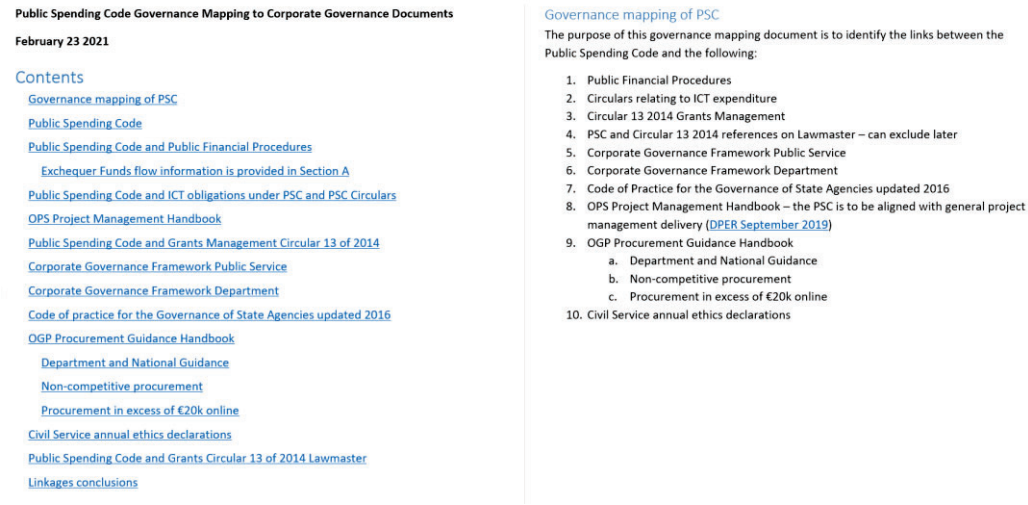
454 Eolas Magazine., (2018), *The National Development Plan in Brief.* Paragraphs 10, 16, 17 and Figure Big Ticket Priorities. Published in March 2018 by Eolas Magazine, Dublin, Ireland Available at https://www.eolasmagazine.ie/the-national-development-plan-in-brief/ (accessed 16 August 2021)

Note: Eolas is the Irish for Knowledge – see teanglann,ie for translation into English.

our Department, our Agencies, Local Government and, also the financial data for the companies.



**Public Spending Code Governance Mapping to Corporate Governance Documents**

**February 23 2021**

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Department and National Guidance
Non-competitive procurement
Procurement in excess of €20k online
Civil Service annual ethics declarations
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Linkages conclusions


Governance mapping of PSC

The purpose of this governance mapping document is to identify the links between the Public Spending Code and the following:

1. Public Financial Procedures
2. Circulars relating to ICT expenditure
3. Circular 13 2014 Grants Management
4. PSC and Circular 13 2014 references on Lawmaster – can exclude later
5. Corporate Governance Framework Public Service
6. Corporate Governance Framework Department
7. Code of Practice for the Governance of State Agencies updated 2016
8. OPS Project Management Handbook – the PSC is to be aligned with general project management delivery (DPER September 2019)
9. OGP Procurement Guidance Handbook
    a. Department and National Guidance
    b. Non-competitive procurement
    c. Procurement in excess of €20k online
10. Civil Service annual ethics declarations

**Figure 4.8 Action Research Cycle 1, Public Spending Code, Report 1, Governance Mapping Initial Report, (2021), Marita Gonsalves (internal report unpublished)**

The initial governance mapping document was expanded. The scale and complexity of Ireland's Public Sector is highlighted in the register of Public Bodies recorded by the Central Statistics Office (CSO) which identified many public entities where there should be useful financial budget data. I sought to reconcile the initial governance mapping document with budget and actual financial data relevant for our Department, our Agencies, and the Local Government level, initially intending to also document the financial flows into the other entities and map to the relevant PSC guidance, Governance Codes, Accounting standards e.g., for local government the national accounting manual for Local Authorities, and circular 13 of 2014 the Grants circular.

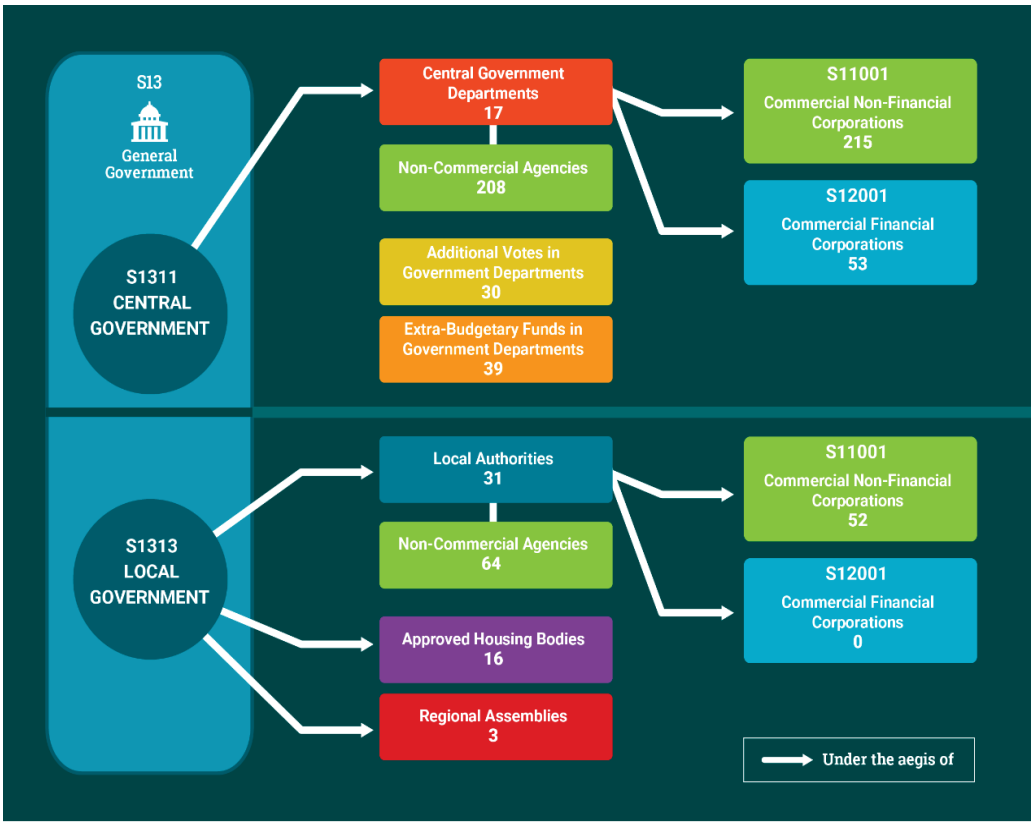


**Figure 4.9 Central Statistics Office, Ireland, (2019), Register of 728 Public Sector Bodies 2019 at [https://www.cso.ie/en/releasesandpublications/ep/p-rpbi/registerofpublicsectorbodies2019/](https://www.cso.ie/en/releasesandpublications/ep/p-rpbi/registerofpublicsectorbodies2019/)**

This proved impossible. The financial information wasn't available it wasn't being used. Yet this financial data should in theory, be available after the financial year end if not in real time. Financial data is a powerful economic tool, yet it appears to be excluded from PSC ex-post and ex-ante appraisals in terms of linking into budgets, or actual, audited expenditure. This was an area where change and improvement could be achieved in a collaborative approach and very suitable for AI RPA

I consulted with ICT experts in the ICT Managers network, a network of over 100 public sector bodies in Ireland, they were of the view that AI was increasingly an important

opportunity for public policy that AI ethics needed to be explored further, black box and decision-making was referenced, transparency, that governance documentation needed to be updated to reflect governance of AI.

### 4.5.4 Applying PSC fitfully and limited technical capacity for financial appraisal

*Review the data and look for contradictions.* What contradictions are there between what we would like to happen and what seems to happen?

Projects and programmes worth hundreds of millions were being approved yet challenges in relation to financial flows, that without a firm understanding of all financial flows the Department, other Departments', Agencies, local authorities, and consultants, Department divisions approving PSC strategic appraisals cannot, conduct a robust financial and economic analysis.

PSC policy assessment was being undertaken but it was observed that a strategic assessment decision should not present as a 'fait accompli' with planning permission granted. AI RPA in financial appraisal, a very clear-cut area, would support Strategic Assessment of financial appraisal.

The absence of risk assessment and self-assessment of compliance with PSC, and PSC assessment using the Supreme Audit Institution financial management maturity model appeared to contradict the stated intention to comply with PSC rules. A contradiction had emerged in understanding of personal accountability, governance, financials, and compliance with PSC obligations. There are fragmented manual systems, time pressures, lack of awareness of PSC rules. I thought about how much easier it would be for everyone

nationally if existing financial data was used including all budget data which AI RPA could provide nationally. I listened to my colleagues' express worries about managing budgets of millions in this environment. I noted how appreciative they were about the possibilities and recommendations for improvement which could be made through the governance mapping exercise, including AI RPA for financial appraisal. I also noted the absence of training in PSC obligations. I could undertake an assessment using Ireland's Supreme Audit Institution financial management maturity model.

I discussed PSC with DPER, who stated that it is important to note that the National Development Plan is not a vehicle through which projects are approved. Being named in the NDP does not constitute Government approval or selection of a preferred option. Prioritisation within the capital allocation is a matter for the Approving Authority. In relation to a SAR template, DPER stated the Approving Authority should identify lessons learned from previous similar projects which should be translated into changes in how the proposed project should be evaluated, planned and managed and that project forecasts will draw on outturn data for similar projects where possible, that this project will be used to inform future projects. DPER also noted that the Approving Authority must be aware of the dangers of anchoring around a particular option, or over-specifying an investment proposal at the SAR stage, that there are significant lead-in times for major public investment proposals, that options within the proposal should not be closed off too early in that process, to ensure that the intervention developed is flexible and that it can be adapted as necessary to be fit for purpose and maximise the outcomes from the investment, that affordability should remain a key focus for both the Sponsoring Agency and Approving Authority in the context of the opportunity cost of a proposed investment and in light of

limited public resources. DPER also emphasised the need for clear delineation of roles and responsibilities and detailing of the range of triggers for action by different stakeholders, that the governance structures should be clearly set out and separate to the governance structure for the policy. They stated that it is the responsibility of the Approving Authority to clarify at an early stage who the sponsoring agency (requests the funding) is and to clearly set out responsibility for project roles.

The initial governance mapping report headings are set out below. The report was provided to my line manager for consideration who felt that it needed more detail of specific examples of existing practice. I was asked to gather case study examples of projects or programmes approved through the Department to submit to my Department's management board as part of the governance mapping assessment and recommendations report.

My role was then agreed as: Support delivery of the Department Public Spending Code VFM and evaluation requirements. Ensure there is awareness of PSC obligations across the Department, working with all Department Divisions, Agencies and other Bodies under Department aegis and the local government sector. Support the section, in consultation with business units, in developing a programme of spending reviews, ex-post and ex-ante evaluations, financial appraisal, exchequer cash flow, a programme of appraisals to meet the requirements of the PSC, with a specific focus on ensuring the quality and methodological soundness of the analysis. Provide evidence-based advice, and support, for line divisions of the Department through review of appraisals and to develop a training and education awareness programme for PSC and governance mapping of PSC.

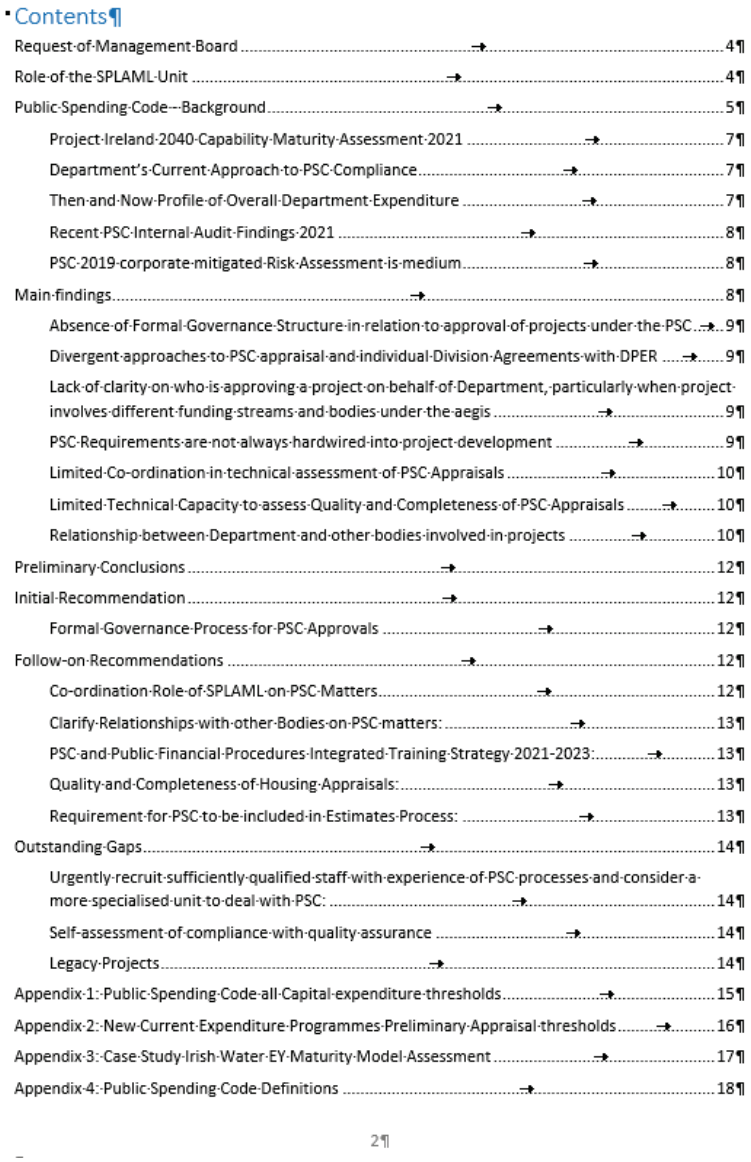

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**Figure 4.10 Contents Page of the First Briefing Note for Management Board 02 June 2021**

A new cross-Division team a Housing Financials Group was established in 2021. I volunteered in April to be part of this team, noting that it might help progress understanding of PSC financial appraisal requirements. The Housing Financials Group team lead had confirmed that rather than being a separate thematic area at this stage, as the financial

aspects cut-across all 6 themes, the plan is to ensure there is a consistency and co-ordination to this aspect of the work. It was a wonderful opportunity to be involved in budget management and bring in the opportunity to consider RPA with budgets for the Department, and beyond. I provided the OECD documents on Tax Policy, affordable housing, EU documents on Energy Efficient mortgage, and case study examples of other EU countries who had used these opportunities for example in Latvia and the EIB. This cross-Division team was not involved other than to comment. It was an excel document using the multi-annual capital framework budget. Although disappointed at the lost opportunity it reminded me why there was need for AI RPA budgets for the longer-term (more than three years) capital budgets.

### 4.5.5 Introducing Change, PSC Financial Appraisal starting the RPA journey

> *Tackle a contradiction by introducing change.* By reflecting critically and creatively on the contradictions, what change can we introduce which we think is likely to be beneficial?

I reflected on the learnings and contradictions and in this Cycle. I worked collaboratively to introduce one change which I thought would be beneficial and commenced that engagement with the newly established cross-government Capital Investment Action Team through the Department representative on that team and outlined the work I was doing in this area as part of my doctoral research. She asked for my views about their draft Terms of Reference (ToR) and continued to send me updates of the ToR for any further suggestions. I updated in relation to: Automating Financial Appraisal

through AI, RPA and potentially Blockchain and Swarm Robotics in partnership with DPER RPA team.

I contacted DPER RPA February 2021, advising that I was doing this doctorate and that I felt that PSC was, in my opinion very suited to RPA and in later steps machine learning using our existing government financial datasets. My tutor in SSBR was agreed and I had discussed with colleagues in ICT managers. DPER RPA agreed it was a very suitable area but noted that they needed a budget to progress with any national assessment.

I also discussed financial appraisal, exchequer cash flow and swarm robotics and blockchain for grant management. DPER RPA team introduced me to colleagues in the Local Government Management Agency (LGMA) with a view to the LGMA also applying this process as I had previously commenced an RPA project for grants management, but this was a much broader project. As part of ongoing engagement with the LGMA I also suggested they contact the OGCIO Build to Share team to evaluate the Desktop as a Service (DaaS) and Infrastructure as a Service (IaaS) offerings noting this might facilitate broader use of blockchain (an option was available through EU OPSI) for all grant management. That work is ongoing and the engagement between the LGMA and DPER Build to Share Team is also ongoing. My role in that part ended. The LGMA is an Agency of my Department, responsible for managing many Local Government systems.

I registered for the UIPath RPA course and updated my line manager and Assistant Secretary about the approach. I advised that I would be doing the course on my own time so it wouldn't impact on my working day that I was looking to build a robot to deliver PSC exchequer funding appraisal that DPER RPA were interested in RPA use with PSC when I contacted them in March with my idea, had wondered why it hadn't happened before.

I commenced engagement with UIPath because of my engagement with the DPER RPA team at their advice and had at a training seminar queried the USA blockchain and RPA grants management. They confirmed on 25 March 2021:

> "Yes, in the US Federal government, we are seeing RPA enable Blockchain to exchange information with existing IT systems as well as help establish monitoring around transaction processing activities. Blockchain can ensure trust to RPA orchestrated process flows by providing secured environment to validate all transactions and maintain audit trail in an immutable shared ledger. If integration is designed amicably, RPA and Blockchain can fully automate end-to-end digital process flows to achieve enterprise-wide goals.
>
> We would love to discuss any requirements you might have in your existing role as UiPath are investing in Ireland and we want the work Closely with the Irish Public Sector, and we see RPA as the gateway to AI and Blockchain. Machine learning and AI are becoming foundational to the way government serves the pubic at speed and scale. Robotic process automation gives agencies adaptive building blocks to support AI/ML initiatives while allowing humans to do what they do best. Happy to discuss further or help you with a simply prove of concept."

I decided to work with UIPath but wait until I had the updated financial appraisal guidance. I gathered all Financial Appraisal guidance relating to PSC which was outside of the existing PSC appraisal guidance.

I met the Department of Transport, Tourism, and Sport PSC appraisal team. They provided their training documentation. They were agreed training was an important aspect of institutional delivery of national PSC policy. That Department had an established PSC appraisal team and processes and had a comprehensive training plan and processes in place. They had a detailed Financial Appraisal guidance document which they provided.

When I had previously worked as head of my Department PSC quality assurance evaluation unit I had developed and delivered the Department's Integrated Training Strategy reporting progress in the annual quality assurance report. Separately, but as part of national training, I also collaboratively developed a case study relating to application of PSC in policy assessment, in partnership with DPER and one other government Department, it was used in the recruitment competition for AO Graduate Economists. This was the first time a PSC case study had been developed. Although I was interested in also progressing this path, I was asked by my line manager, to defer the training piece and focus on the financials and on case studies and systems to ensure that we had a comprehensive picture of existing processes, documentation, and approval status. I deferred. The case management system was emerging as a very significant element for Cycle 2.

### 4.5.6. Monitor the change: AI eyes on Financial Appraisal

*Monitor the change.* What happens day by day when the change is introduced?

Over the following weeks I monitored the change. In this cycle I had sought to establish what the current position was, what the gaps were, and the appetite to effect change and improvement by people accountable for approving billions. In the Governance Institutions, I was focusing on people and process but also gradually introducing the concept of technology, specifically AI, RPA and Machine Learning (for budgets) and how it could support their work.

Automating Financial Appraisal is progressing slowly, the strategic assessment template was blocked, and I was asked to defer the PSC learning and development training

strategy. Some observations from senior management on project appraisals greater than €100m, provided insight into the people aspects. And also the desire for change.

> "…this is a critical project for the Government, Minister, XXX, XXX and most importantly the people of XXX and XXX…. while there are shortcomings identified in the strict adherence to the PSC in terms of the extent of options considered, and indeed the applicability of some of the PSC methodologies to such a project, …
>
> ... We are currently working on proposals for further discussion with you on how to better align the appraisal and assessment of such projects with the PSC regime for future such projects."

And an extract from a related email sent after the decision was made, and bypassing the strategic policy unit recommendation …"Thanks all for the input on this and to 'Assistant Secretaries names here' for the final edit of the response and document under pressure on Friday evening." The email was sent to the strategic policy unit the following Monday.

Change doesn't happen easily, and senior management needs to be on board. I focused on continuing building processes to support all in PSC appraisal, building the future learning from the past and the present.

**Action 1: Automating Financial Appraisal through AI, RPA and potentially Blockchain and Swarm Robotics – Ongoing**

My role with financial Appraisal through AI, RPA and potentially Blockchain and Swarm Robotics continues. I contacted DPER NIO they also agreed this was a useful change and agreed to provide me with updated information on PSC financial appraisal requirements for use in developing an AI augmented budget.

I had also contacted DPER NIO about AI RPA and financial appraisal. I paused this work awaiting the DPER NIO new financial appraisal requirements. I discussed the rationale in meetings with them and they were very interested and suggested I base my work on the forthcoming financial appraisal guidance. I provided details of how this had been achieved in the USA for public sector. I originally provided DPER NIO with the below data 28 April 2021 as per email.

"Again thanks for meeting yesterday. I am attaching some information for you or urls below, on financials, RPA and Blockchain and grants, all of it is available online.

1. TII PSC general financial analysis for PSC attached, I had been thinking about using this with the DPER Financial Analysis guidance.
2. Circular 13 of 2014 checklist for grants management. DPER (2014) Circular 13 of 2014 Management of and Accountability for Grants from Exchequer Funds and Guidance notes and reporting requirements available at https://govacc.per.gov.ie/wp-content/uploads/DPER-Circular-13-14-Guidance-Note-and-Reporting-Requirements-1.pdf
3. USA on Blockchain for grant management https://www.mitre.org/sites/default/files/publications/PR-19-1654-MITRE%20Grants%20Mgt%20Blockchain%20Study%20Report.pdf
4. USA on RPA https://digital.gov/pdf/state-of-federal-rpa.pdf
5. EU European Court of Auditors on blockchain and practical applications for expenditure control https://www.youtube.com/watch?v=v5Ej4LfqQBg
6. AI watch for public services is interesting.
7. CSO central and local government bodies at *Register of Public Bodies 2019* produced Oct 2020 by CSO [Actual diagram provided and is the same as **Figure 4.9** above]. https://www.cso.ie/en/releasesandpublications/ep/p-rpbi/registerofpublicsectorbodies2019/

I will send you on the specifics re financial accounting and budgeting and AI in government separately."

Email ends:

I hadn't heard back from DPER NIO and the advised new financial appraisal guidance wasn't issued in the following weeks. I followed up. They responded August 23rd to say that they would provide me with the financial appraisal updated guidance for comment in the coming weeks before it was finalised and issued nationally. I was delighted about the chance to influence this national guidance. I also applied to take part in an upcoming DPER AI foundation course. DPER circulated an invitation earlier in August, to apply to take part in a pilot course, a "foundation certificate in AI to assist public servants appreciate some of the fundamental issues around AI such as:

- What AI can and cannot do and how it might be deployed in a public service setting
- The ethical implications of deploying AI
- The management of AI projects
- The mathematical and statistical underpinnings of AI
- The visualisation and cleansing of data prior to model training
- The testing and verification of AI models
- How to develop a small AI project to consolidate some of the learnings in the course."

I applied for this course as it offers a great opportunity to progress the PSC RPA exchequer funding element of financial appraisal. I submitted the request to join 09 August.

Email 09 August MGonsalves to DPER Training:

"I'd like to apply for the AI foundations course. I have a relevant AI project. My Department is funding my doctoral research which focusses on ethics AI financial data and Public Policy. I commenced engagement with DPER NIO and RPA developing an AI, RPA exchequer funds flow for the Public Spending Code (PSC) (see below).

I have a level 9 in accountancy, and through chartered accountants Ireland, a specialist qualification also level 9 in Cyber Security and Data Incident Management. My line

manager, copied here, is on annual leave and won't be back before the deadline date re time and I would be happy to work in my own time if that allowed me participate in relation to the PSC AI RPA and exchequer funds flow.
I had been in touch also with (name removed) DPER RPA about this project"

The email thread also included the original email to PER NIO 28 April 2021 and the follow up email 09 August 2021. They never responded directly to me but later they advertised a relevant course.

### 4.5.7: Influencing National Financial Appraisal Guidance

*Analyse evaluative data about the change.* What is happening in this situation now – as understood by the various participants – as a result of the changes introduced? Using research methods what can we find out about it?

Ireland's national AI strategy is since published and highlights the imperative to embrace AI in how we deliver public services. I was a member of the national AI committee for a period of time and had emphasised as part of my submissions through the Department, AI ethics training for all, consideration of AI governance. A course in AI for all citizens had been recommended by the Committee, the course was run by the Finland Government. I completed that course and their building AI course both of which informed my thinking about PSC and how AI would enhance this national Policy tool.

In early engagement with the cross-government Capital Investment Action Team. I outlined the work I was progressing relating to PSC, RPA, Machine Learning and Blockchain and asked that they consider it in the wider national framework and the Department representative on the team had asked me to comment on various iterations of

their draft report which I did, always clearing my suggestions with the head of the Strategic Policy Unit, my line manager.

The cross-government Capital Investment Action Team identified the absence of digital tools in their draft report but did not mention the engagement commenced with DPER RPA team in relation to RPA and Financial Appraisal. This, taken with the non-response to getting the updated financial appraisal template to work with was a disappointment. I checked in with my line manager who advised that this was that Action Team's call to make.

Action 1 above is progressing. This is an excellent opportunity to develop AI augmented RPA PSC Financial Appraisal and guidance nationally. But in October 2021 the RPA team, who hadn't responded, then issued an invitation to apply for a formal course if you my line manager refused to approve my attending this 10-week course citing funding of my doctorate and Irish course and the time required as the reasons. I thought about continuous accounting, as the basis for Exchequer Funded Financial Appraisal, as another possible route.

### 4.5.8: Gathering statistics and financial data for a Proof of Concept

> *Review the change and decide what to do next.* Was the change worthwhile? Are we going to continue it in future? What are we going to do next? Is the change sufficient?

Was documenting the current situation worthwhile? Yes. The discussions with colleagues, Agencies, ICT managers, PeakConnexxion, DPER and OGCIO highlighted many issues which moved my focus from the observations of lack of awareness and stated lack of understanding of PSC by colleagues approving billions in expenditure to reflecting

on how I might be able to bring transparency and rigour to manual processes, considering also, the appropriate routes through which to build traction.

The PSC systems had failed internally in the intervening years, but they had also failed nationally in that there didn't appear to be any governing entity highlighting the lack of published data and the inconsistent publication of PSC data by the various entities. There is no overall PSC assessment nationally, across tiers of government, including the public sector companies identified on the CSO register. A national solution needed to be considered, I thought it should be the grants RPA and blockchain solution reported in the USA, and in the context EU OPSI blockchain, interoperable systems across the EU public sector. Public Policy for Ireland, in this EU AI, RPA and Blockchain context became an increasing focus.

But I still was wondering about how people who had self-assessed PSC compliance using PSC quality assurance processes and who undertook annual risk assessment kept saying they were unaware of PSC obligations. Should I focus more on the institutions and the processes, than individual accountability? I began to reflect on the democratic accountability aspects of PSC, thinking of Amiel (1988 Fontaine Pascal) "Each man's experience starts again from the beginning. Only institutions grow wiser: they accumulate collective experience; and, owing to this experience and this wisdom, men subject to the same rules will not see their own nature changing, but their behaviour gradually transformed".

Whitton, H., (2001) of Transparency International stated "Ethical conduct and corruption in the public sector are two sides of the one coin" also in relation to ethical laws, codes of ethics and codes of conduct, that:

> "The major problem for implementing effective Codes of Ethics remains that no law or Code will be of much value if individual civil servants lack the technical competence to recognise an ethics problem for what it is, or if they do not know what standards their organisation expects of them, or (worst of all), if they consider it not be to in their interests, personally or professionally, to take a stand for integrity against corruption.

He also states that "Managers (including the political leadership of the organisation,) must set the example. 455 Very strong words, which resonated with me.

It made me think about individual accountability and the work of public servants. SIPO's annual report (2021) noted that 'for a number of years, the Commission has called for a comprehensive review of the existing ethics framework' noting that

> "In annual reports and legislative submissions, the Commission recommended that new legislation be drafted based on best practice for dealing with conflicts of interests. New legislation should consolidate the provisions of the Ethics Acts, all other relevant legislation, and the relevant provisions of the Code of Practice for the Governance of State Bodies. In its annual report for 2019, the Commission recommended that the incoming government give urgent consideration to passage of revised ethics legislation, which is long overdue."

The SIPO report includes a section detailing major recommendations of previous years where no progress at this time could be reported 11 pages. They reference the anti-fraud and anti-corruption working group report of November 2020, (the Hamilton Group report) that its recommendations "broadly seek to address structural/systemic issues and resourcing, and to enhance the legislative framework, particularly in respect of

455 Whitton, Howard., of Transparency International., (2001), *Implementing effective ethics standards in government and the civil service* Pages 3 and 12. Published by Whitton, Howard of Transparency International, OECD, Paris, France, February 2001 https://www.oecd.org/mena/governance/35521740.pdf (Accessed 17 August 2021)

enforcement and coordination powers for anti-corruption bodies" noting that "Government has accepted these recommendations" and "SIPO will support this work".456 The SIPO annual report does not reference AI tools usage and doesn't specify AI ethics.

The Hamilton Review Group (2020)457 report also does not reference AI tools usage and doesn't specify AI ethics, nor does the report Action Plan. The report refers to the FATF 2017 reports on Ireland, but FATF and its' reports and recommendations, not referenced in the Hamilton Report 'Implementation Plan'.

Ireland is a member state of the EU adhered to EU laws and standards including ethics standards and gets EU grant funding, yet no EU agency was identified. Ireland's Local Government sector doesn't appear to be represented by an Agency or the Department with parental responsibility for it, (my Department). I wondered was there a mechanism for citizen voice in the implementation plan. The plan doesn't mention AI tools usage and doesn't specify AI ethics.

The FATF., (2019), second follow up report and technical compliance re-rating, states that Ireland 'has made progress to address technical compliance deficiencies on 13

456 Ireland, Standards in Public Office (SIPO) (2021) *Annual Report Independence, Impartiality, Integrity* Pages 13, 31-41 Published by SIPO, Dublin, Ireland Available at https://www.sipo.ie/reports-and-publications/annual-reports/2020-SIPOC-ARFinal-English-Web.pdf (accessed 17 August 2021)

457 Hamilton Review Group., (2020), *Review of structures and strategies to prevent, investigate and penalise economic crime and corruption* Page 11, Published by the Hamilton Review Group, Department of Justice, Dublin, Ireland at http://www.justice.ie/en/jelr/hamiliton_review_group_report.pdf/files/hamiliton_review_group_report.pdf (accessed 21 August 2021) and *Review of structures and strategies to prevent, investigate and penalise economic crime and corruption Implementation plan* http://www.justice.ie/en/JELR/HRG_Implementation%20Plan.pdf/Files/HRG_Implementation%20Plan.pdf

recommendations' and 'implementing new requirements where the FATF recommendations have changed since the mutual evaluation report (MER) was adopted', upgrading 11 recommendations but that two of the recommendations, 'where progress has been noted, that the progress has not justified re-ratings on those Recommendations', and that Ireland moves from enhanced to regular follow up and that Ireland will continue to report back to the FATF on progress to strengthen its implementation of AML/CFL measures.458 The FATF., (2022) note further improvement made, re-rated one of the two recommendations and notes that 'Ireland will remain in regular follow up and will continue to report back to the FATF on progress to strengthen its implementation of AML/CFL measures'[459]

I attended a training course relating to the PSC and the related Capital Management Works Framework (aligned to PSC) to understand the other governance compliance documents my colleagues use. I was surprised at the discussion about corruption in the context of Cartels and Price Fixing in the construction industry, and the trainer cited a case in the North of Ireland, where three companies were convicted of a price fixing cartel, that

458 FATF (2019), Anti-money laundering and counter-terrorist financing measures - Ireland, Enhanced Follow-up Report & Technical Compliance Re-Rating, November 2019, Pages 1, 2 and 9. FATF, Paris, France, available at: http://www.fatf-gafi.org/publications/mutualevaluations/documents/fur-ireland-2019.html (accessed 17 August 2921)

459 FATF., (2022), Anti-money laundering and counter-terrorist financing measures - Ireland, Enhanced Follow-up Report & Technical Compliance Re-Rating, February 2022, Pages 2 and 5 FATF, Paris, France. Available at: https://www.fatf-gafi.org/media/fatf/documents/reports/fur/Follow-up-report-Ireland-2022.pdf (accessed 25 February 2022)

two of the three companies admitted the infringement and agreed to pay the fines imposts and one of the three companies noting:

> To put it in context, the fine - which is among the biggest ever imposed in Northern Ireland corporate history - amounts to more than the £18.2 million which FP McCann cleared in profit in 2019.
>
> But the company is nonetheless hugely well capitalised, as has enjoyed a stellar period of growth over a prolonged period, with sales last year rising to £264m. 460

It was noted that any convicted firm could continue to apply for competitions once they declared the conviction and that they had taken steps to address this and that it was, from then on, the role of the holder of the competition to decide if this was sufficient. Training raises awareness of the challenges faced, in a safe environment, and in a positive way. It was the first time in months of discussion that I had heard anyone speak about the possibility for corruption or price fixing and 'bumping up against it'.

My colleagues were unaware of the content of Ireland's Public Financial Procedures (Blue Book) which meant they were unaware of its' definition of corruption in the context of all civil servants and receiving gifts. SIPO only requires certain posts to make annual declarations. I would be of the view that all public servants approving grants for capital and current expenditure for projects and programmes worth hundreds of millions, should be obligated to make those declarations even if not an approved post and not directly involved in procurement.

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460 Mc Donald, Gary., The Irish News (2020) *Builder McCann loses appeal into 25.5m cartel fine* Paragraphs 1, 11, and 12, Published by Mc Donald, Gary., Business Editor of The Irish News, Ireland on 23 December 2020 01:00 (https://www.irishnews.com/business/2020/12/23/news/builder-mccann-loses-appeal-into-25-5m-cartel-fine-2168409/ (accessed 17 August 2021)

I researched Cartels further, in the context of the UK Competition and Markets Authority (2022), website on 26 February 2022 search highlighted, in relation to Building and Construction both open and closed cases, that there were 19 cases of which 3 were 'Criminal Cartels' and 16 were 'Competition Act 1998 and Civil Cartels'.[461]

Cummings, Stephen., Bridgman, Todd., and Brown, Kenneth. G., (2015), reference Lewin's Changing as Three Steps (CATS) model stating that Lewin is assumed to have given us unfreeze-change-refreeze, which is only 33 percent right (he only wrote unfreeze). They acknowledge his work however, as "seminal without the model being fully his" and the table below includes the CATS model with models by other advocates of change management, as set out below.

461 Competition and Markets Authority, UK., (2022), Competition and Markets Authority Cases UK webpage available at https://www.gov.uk/cma-cases?case_type%5B%5D=ca98-and-civil-cartels&case_type%5B%5D=criminal-cartels&market_sector%5B%5D=building-and-construction (accessed 26 February 2022)

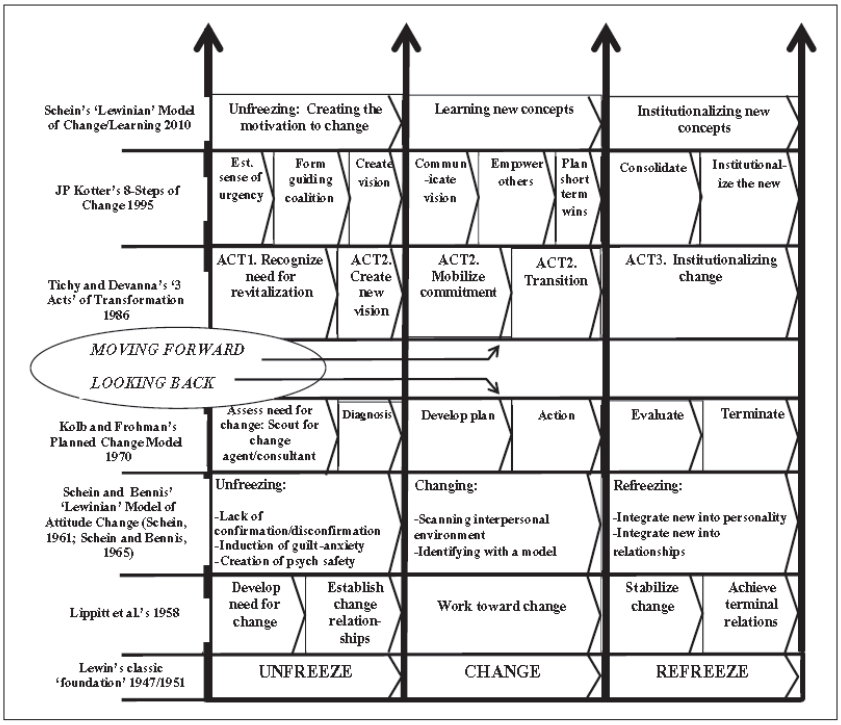


**Table 4.1 Cummings, Stephen., Bridgman, Todd., and Brown, Kenneth. G., (2015) Lewin's Changing as Three Steps (CATS) model, a seminal change management advocacy model 'foundation 1947/1951'**

They also stated advances in statistical techniques and computing power offer potential to examine not only relations among many variables at once but also changes in these variables over time. 462

I commenced gathering Ireland's statistical and financial data intending to use as training data on the basis that it was audited or through government finance statistics could be reconciled with audited data therefore this data could be used as training data for

462 Cummings, Stephen., Bridgman, Todd., and Brown, Kenneth. G., (2015), *Unfreezing change as three steps: Rethinking Kurt Lewin's legacy for change management* Pages 39, 42 53, Published by Cummings, Stephen., Bridgman, Todd., and Brown, Kenneth. G.: The Tavistock Institute, Human relations 2016, Vol. 69(1) 33– 60 © The Author(s) 2015 First published September 30, 2015 available at https://doi.org/10.1177/0018726715577707 (accessed 12 August 2021)

machine learning. It is publicly available at the DPER databanks, Ireland's CSO, Eurostat and the IMF.

Is the change sufficient? No. Awareness alone won't deliver. The institutions and governance processes need to be strengthened to introduce AI, financial understanding, ethics awareness, and greater citizen voice into this national, manual, fragmented policy space. I submitted the first SSBR assignment to my Assistant Secretary who made no observations or suggestions for change. As mentioned earlier, I was of the view that a national case management tool for PSC, dashboard and suite of reports which could incorporate Project Ireland 2040 database and AI would enhance this national Policy tool.

There is, in summary, the need to update Ireland's ethics governance, there is improvement in AML.CFL measures, there is appetite to automate PSC Financial Appraisal, but lessons in Capital project management do not appear to be translating across sectors. Definition of AI ethics, in the context of public financial management and public policy, will bring further change and improvement to Ireland's policy-making tools.

What are we going to do next? Continue progression of the RPA project, and even though deferred gather background information to develop the PSC training strategy and plan as continuation of Cycle 1. Gather the relevant financial statistics for machine learning training. Progress the RPA Financial Appraisal project as a collaborative exercise through the DPER RPA team or if needed via Finland ElementAI as my Department CIO whom I had discussed this idea with, agreed that audited financial data and financial statistics were global languages. AI RPA Financial Appraisal, using RPA and Blockchain for grants management supporting the work of Policy Makers, in Ireland, the EU and globally.

I also planned to commence gathering case studies and commence work on identifying how to develop/deliver a national case management system in Cycle 2. Consider AI Ethics, Governance by AI, Citizen Voice and Robot Citizen Voice in Public Policy, by reaching out to Citizens who are also accountants in a network I am part of where I had been invited to speak about Public Policy and their Citizen Voice, and through a pilot Civil Service training course 'Storytelling for Maximum Leadership Impact', reach out to senior managers within the Civil Service on the topics of AI Ethics and Governance by AI in Cycle 3.

## 4.6 Cycle 2: Engagement and Traction on a slow journey a national PSC digital tool e-PSC

### 4.6.1 Case Studies AML/CFT in Environmental Crimes, PSC case studies in a €116 billion fragmented National Capital Programme, a case management tool digital is also needed

*Define the inquiry:* What is the issue of concern? What research question are we asking? Who will be involved? Where and when will it happen?

Significant issues to explore were emerging, the key issues included financials supporting policy, an un-coordinated approach to PSC governance in the Department, staff is under pressure for programme and project delivery and PSC perceived as 'slowing things down' when there were other governance structures in place for financials already. Cycle 1 had concluded that PSC processes were not embedded into the daily operations and increasingly it was becoming evident that the fragmented nature of capital project/programme delivery nationally was cause for concern.

Ethics was emerging as an issue for consideration in terms of accountabilities and awareness, in an environment where there had been no programme of PSC training in years in the Department and no ethics training. AI and financial data appraisal is an area of interest and beneficial to national policy development, assessment, delivery and evaluation.

In Cycle 2 I gathered Case Studies of existing PSC issues; undertook a financial management maturity model assessment targeted towards the PSC, prepared the submission for management board, and commenced work on a national digital model. It was expected that this Cycle would take 12-16 weeks. Case studies inform and educate.

Far too often the public only hears bad news stories about public sector, about waste and extravagance, in use of public funds. They don't often hear about the good news, the hard work, the efficiencies, or the benefits for us all as citizens when public sector uses the best financial and other data, and case studies to identify instances of good practices and we learn from them to improve processes and service provision.

For example, the FATF., (2021), report on money laundering from environmental crime "brings together expertise from across the FATF's Global Network to identify good practices that governments and the private sector can take to disrupt the profitability of environmental crimes", that, "Experts from Canada, Ireland, and UN Office on Drugs and Crime (UNODC) co-led this study" noting "the findings for this report are based on case studies and good practices provided by over 40 countries, alongside expertise from civil society and the private sector" also that "government actions to detect and disrupt financial flows have not been proportionate to the scale of environmental crime" and they mention "the need for AML authorities to build working relationships with non-traditional partners including

environmental crime investigators and environmental protection agencies to establish multi-stakeholder dialogues".463

Ireland's Minister of the Department of Finance noted this study as an "important addition to the toolkit of policy makers internationally, noting that the report details the full scale of these crimes to help us better understand this issue, and that detail actions governments and the private sector can take to disrupt these financial flows.464

The case studies highlight instances of environment crimes and are a very useful resource for anyone involved in approving financial transactions, for awareness raising and risk assessments and in policy appraisals. The FATF accompanying information handout notes the report is relevant to both public and private sectors, states that "the same individuals involved in environmental crimes are often engaged in other criminal activities, such as corruption, tax crimes and human trafficking and that environmental crime is a low-risk, high-reward crime. It provides a very useful description on collecting financial intelligence for environmental crimes see below.

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463 FATF., (2021), *Money Laundering from Environmental Crime*, FATF, Paris, France. Pages 4, 6 and 9

https://www.fatf-gafi.org/publications/methodsandtrends/documents/money-laundering-environmental-crime.html (accessed 22 August 2021)

464 DPER., (2021). Press Release Minister Donoghue welcomes the publication of the Financial Action Task Force study on Environmental Crime and Money Laundering. Paragraph 4 published by DPER, Dublin, Ireland at

https://www.gov.ie/en/press-release/a3ef2-minister-donohoe-welcomes-the-publication-of-the-financial-action-task-force-study-on-environmental-crime-and-money-laundering/ (accessed 22 August 2021) (Published 08 July 2021. Last updated 08 July 2021)

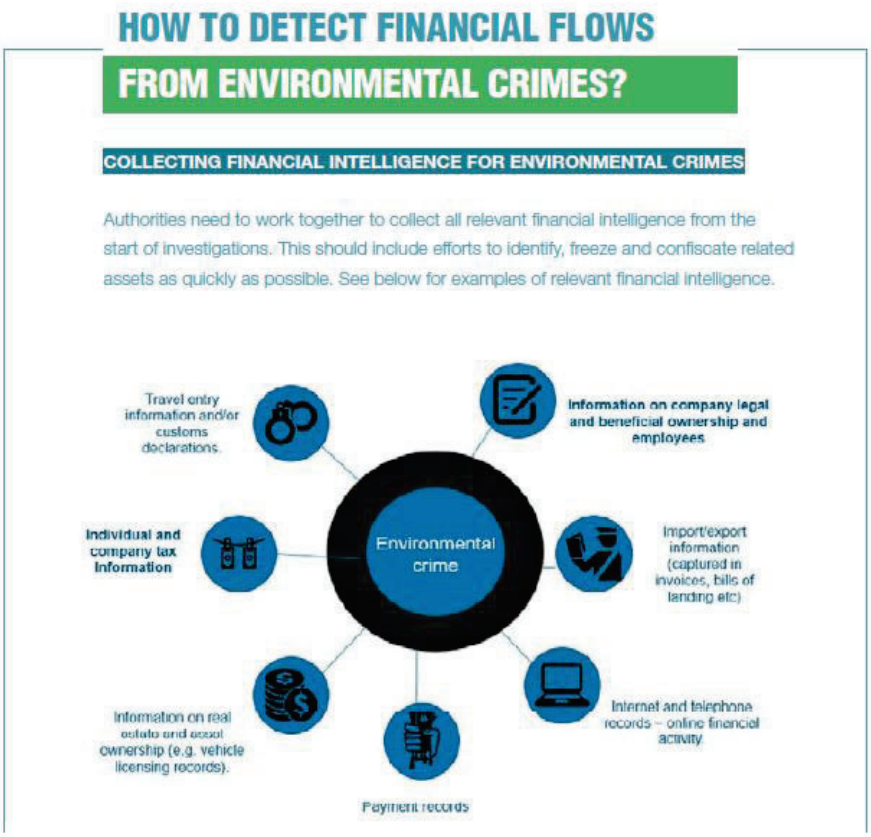


**Figure 4.11 FATF (2021) Collecting Financial Intelligence from Environmental Crimes Page 4, *Money Laundering from Environmental Crime. For Public and Private Sectors***

The report stated "countries did not submit any case with financial investigations involving new technologies (such as virtual assets, or peer-to-peer transactions). However, the absence of case information on the use of new technologies does not mean those criminals are not using such technologies." 465

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465 FATF., (2021), Money Laundering from Environmental Crime. For Public and Private Sectors. Page 4. Published by the FATF, Paris, France on https://www.fatf-gafi.org/media/fatf/documents/reports/Money-laundering-from-environmental-crime-handout.pdf (accessed 22 August 2021)

AI is used preventing/detecting AML/CFT. The FATF, (2021), provide suggested actions to support the use of new technologies for AML/CFT, noting "new technologies for AML/CFT must be developed in a way which reflects threats as well as opportunities, ensuring that their use is compatible with international standards of data protection and privacy, and cyber security". The actions are "Creating an Enabling Environment by Government and Private sectors for Responsible Innovation to Enhance AML/CFT Effectiveness" "including risk assessments, customer due diligence (CDD), and other requirements", and "strengthen their supervision and examination", and noted "good practices for updating internal legacy systems or replacing them with new technologies", including "explainability and transparency of processes and outcomes, oversight by humans, strong cybersecurity and alignment with global, national and technical standards for best practices". They also highlight other measures including to "Promote AML/CFT Innovation which Supports Financial Inclusion by Design" and "Promote and Facilitate Cooperation" suggesting considering developing collaborative environments to facilitate cross-government and/or public private research and development of new technologies and innovative solutions.466

Developing the case studies involved the same participants and developing the bespoke shared services case study management system e-PSC involved the OGCIO BTS team. I separately completed the OG&AG Financial Management Maturity Model PSC element self-assessment. Maturity Models are also a great means to convince and educate

466 FATF., (2021) *Suggested Actions to Support the Use of new Technologies for AML/CFT* Page 1. Published by the FATF, Paris, France on https://www.fatf-gafi.org/media/fatf/documents/reports/Suggested-actions-New-Technologies-AML-CFT.pdf (accessed 04 September 2021)

and the OG&AG had already raised concerns about the PSC and capital project management. They are Ireland's Supreme Audit Institution, they undertake audits, VFM reviews, special reports, and other work, and are independent and impartial.

The World Bank Group (2021), Supreme Audit Institutions Independence Index 2021 reference two main types of government audits, (1) internal audits performed within government departments, and (2) external audits performed by Supreme Audit Institutions (SAI) noting that SAI audits form one of the most important institutions in a country's accountability chain and they reference international tools to assess SAI independence and performance including the INTOSAI global surveys. 119 countries were surveyed, client countries. Ireland was not included in the report.467

Ireland's SAI the Office of the Comptroller and Auditor General (OC+AG) is autonomous and independent. It's Financial Management Maturity Model includes a section which references the PSC and the OG&AG state that their framework could be used by the OG&AG to audit public entities under its' remit. I decided to undertake an assessment linked to the existing processes, but also to development of a national case management system. I had noted the OG&AG had been critical of PSC application in other Departments and Sectors.

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467 World Bank, (2021), *Supreme Audit Institutions Independence Index 2021 Global Synthesis Report.* EFI Insight-Governance. Washington, DC: World Bank. Pages 10, and 13 Published by EFI Insight-Governance, World Bank Group, Washington DC, USA, available at https://openknowledge.worldbank.org/handle/10986/36001?show=full&locale-attribute=en (Accessed 17 August 2021)

Note on page 5: The development and implementation of the assessment tool were conducted under the overall leadership of Edward Olowo-Okere (Director, Governance Global Practice) and the supervision of Adenike, Sherifat Oyeyiola and Manuel Vargas (Practice Managers, Governance Global Practice). The 118 country assessments were carried out by respective Governance teams, with guidance from the Practice Managers.

Over the years, the OC&AG issued public reports including commenting on PSC application for example in 2019, on delivery of capital projects in the higher education sector.

> "A report of the Comptroller and Auditor General in relation to the delivery of capital projects in the higher education sector was presented to the Houses of the Oireachtas today.
>
> The report focuses on the capacity of higher education institutions to plan, manage and deliver large construction projects on schedule, within budget and to the required quality. The review examined ten completed construction projects that had incurred significant time and cost overruns with a view to identifying lessons that could improve the future management of projects. The final construction cost for the ten projects was €350 million, including cost overruns that totaled €67 million.
>
> The projects were carried out in the context of a framework overseen by the Department of Public Expenditure and Reform designed to address the risks associated with large publicly-funded capital projects. This included the 2007 Construction Procurement Reform Initiative, which introduced standard-form fixed price contracts and set maximum targets for cost and time overruns. Detailed procedures for project appraisal, planning, implementation and post project review are set out in the ***Public Spending Code***.
>
> Tender evaluation was the most common weakness at the pre contract phase.
>
> The most common issue during contract execution was changes to the contracted project scope. In some cases, ambiguous and incomplete project documents contributed to disputes between the institutions and the main contractor. In several others, a significant number of change orders were issued by the institutions or their agents. These should only be issued for essential requirements that were unforeseeable prior to tender.
>
> Nine of the ten projects ended up in a dispute resolution process. Such processes can be expensive with significant legal and professional fees being incurred. In one instance, an institute incurred legal and other professional fees of €3.3 million in relation to resolving contractual disputes.
>
> In most instances, HEIs identified learning outcomes that could be used on future projects. However, it is unclear if these learning outcomes are shared across the sector.
>
> Overall, there may be a lack of capacity within the higher education sector to manage large scale capital projects. A rigorous risk assessment should take place at the outset with the objective of ensuring that qualitative factors are more explicitly considered at tender evaluation; detailed works requirements are put in place; and change orders are limited.

There may also be a lack of capacity within the higher education sector to deal with disputes once they enter a formal conciliation/arbitration process.

**Notes for Editors** The full text of the report is available here.

"The Comptroller and Auditor General is an independent constitutional officer with responsibility for the audit of public funds. He reports to Dáil Éireann. The sole and exclusive focus of the report is on public bodies, and not on staff members of those bodies or on any third parties. For the avoidance of doubt, the report does not make any criticism or comment or present any view, whether express or implied, with respect to staff members of public bodies or third parties, and should not be understood as doing so".468

**Figure 4.12 Ireland, OC&AG Delivery of Capital Projects 2019**

This resonated and I agreed with my line manager in September 2021 to undertake a maturity assessment of existing processes.

### 4.6 2: Describe the situation: Assessing PSC Supreme Audit Institution Ireland Financial Management Maturity, Model, Adapting the Institute of Internal Auditors 3 Lines Model for PSC and a report to Management Board roadmap for the PSC policy tool future

*Describe the situation:* What are we required to do here? What are we trying to do here? What thinking underpins what we are doing?

The view was expressed that the PSC was 'getting in the way' of delivery of worthwhile projects, and colleagues did not appear to be aware of Government Memo or Ministerial Decisions powers outlined noted in circular 13/13 below or, as I already had noted, their own obligations and Public Financial Procedures, also a fundamental part of the PSC policy processes.

468 OC&AG, Ireland., (2019), *Delivery of Capital Projects in the Higher Education Sector Press Release of the OC%AG, Dublin, Ireland*, published **29 May 2019** Available at https://www.audit.gov.ie/en/search/?q=public+spending+code (accessed 17 August 2021)

> "… The economic costs and benefits are not always the only factors influencing policy decisions regarding public expenditure. There may also be social or other public policy considerations which inform the decision making process. Nothing in the Public Spending Code should be taken as precluding Government or Ministers from deciding to approve projects independent of the evidence arising from detailed application of the Public Spending Code appraisal requirements. Any such decisions still require Departments to ensure that best practice is adhered to as regards public financial procedures generally, in terms of ensuring that the necessary terms and conditions are applied to secure full accountability and transparency for the funds including the rules regarding sanction of the Minister for Public Expenditure."469

How could AI improve and support expenditure approver engagement in the fragmented policy formulation and delivery? DPER had noted "it is clear from the difficulties being experienced with the "in-flight" projects that having gaps in guidance is causing significant complications and confusion between local government, DHLGH and DPER" and that "the intention of DHLGH to engage earlier in the project life cycle is welcomed." This Cycle comprised 2 new actions, in addition to Cycle 1 action.

1. Example Case Studies of existing PSC issues in the Department as approving authority, including impact nationally, for our Agencies and Local Government and the EU and briefing note for management board
2. Using the OC+AG PSC financial management maturity assessment, Project Ireland 2040 database and accompanying Geohive Project Ireland 2040 map and commencing development of a new Build to Share a case management system tailored for PSC - e-PSC

1. Example Case Studies of existing PSC issues in the Department as approving authority, including impact nationally, for our Agencies and Local Government and the EU and briefing note for management board

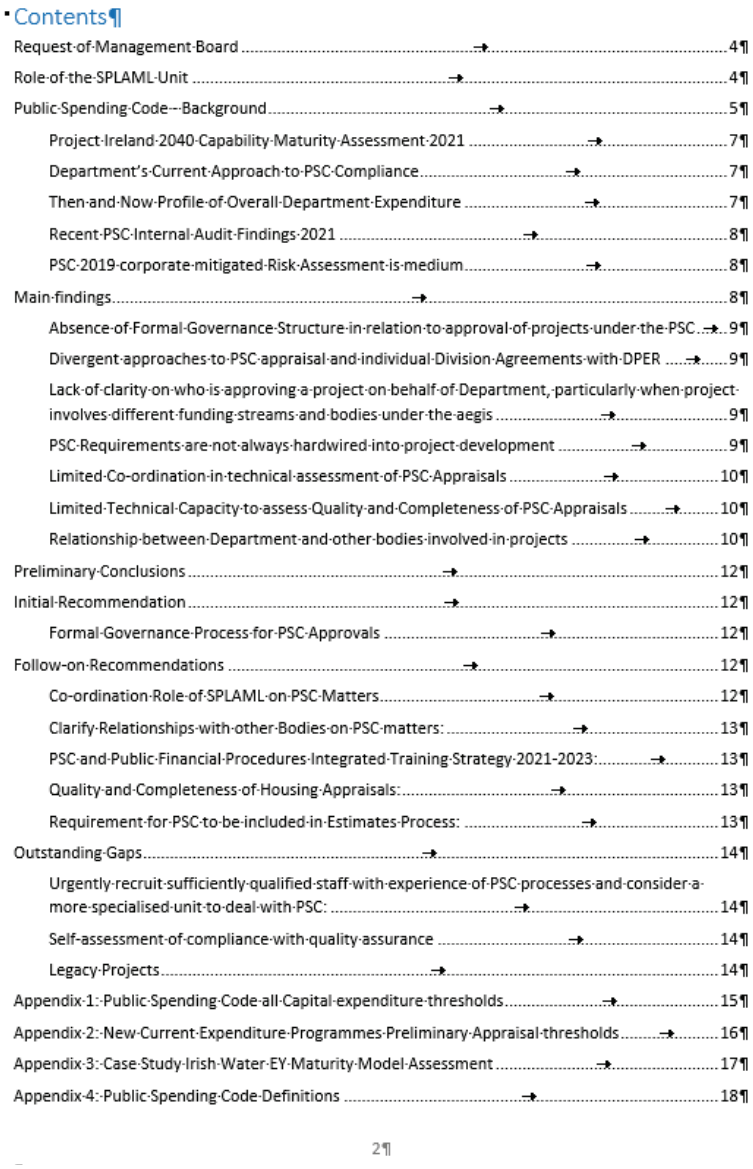
469 DPER, (2013), Circular 13 of 2013: The Public Spending Code: Expenditure Planning, Appraisal & Evaluation in the Irish Public Service - Standard Rules & Procedures. Page 2 Paragraph 6 at

https://circulars.gov.ie/pdf/circular/per/2013/13.pdf (accessed 22 August 2021)

I met with colleagues over a period of weeks and drafted 8 example case studies of existing PSC practices, issues, and recommendations, for inclusion in the management board report. I agreed the case studies wording with each person. The first draft of the report included all case studies, but I was then asked to remove them and reference the case studies verbally, if needed, in a meeting with management board.

The 8 case studies, many for projects over €100m, had identified opportunities for improvement in project management, challenges managing multiple internal funding streams, combining financial and economic appraisal, something DPER had noted as a particular concern, approvals being granted when projects were already commenced (colloquially called 'in-flight') and where strategic policy decisions had already been made before seeking Department approval, confusion as to accountabilities across Agencies and Government tiers.

I redrafted, added in a recommendation made by colleague on our team who suggested to link annual budget submissions with PSC, upcoming projects/programmes in the budgets the Heads of Unit were accountable for.



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2¶

**Figure 4.13 Contents Page of draft Briefing Note for Management Board 02 June 2021 Redacted for case studies**

I used the Institute of Internal Audit 'Lines of Defence Model' which, at the request of our Divisional Assistant Secretary I then adapted to the Public Spending Code. I agree the model adaptation with the Strategic Policy governance mapping team.

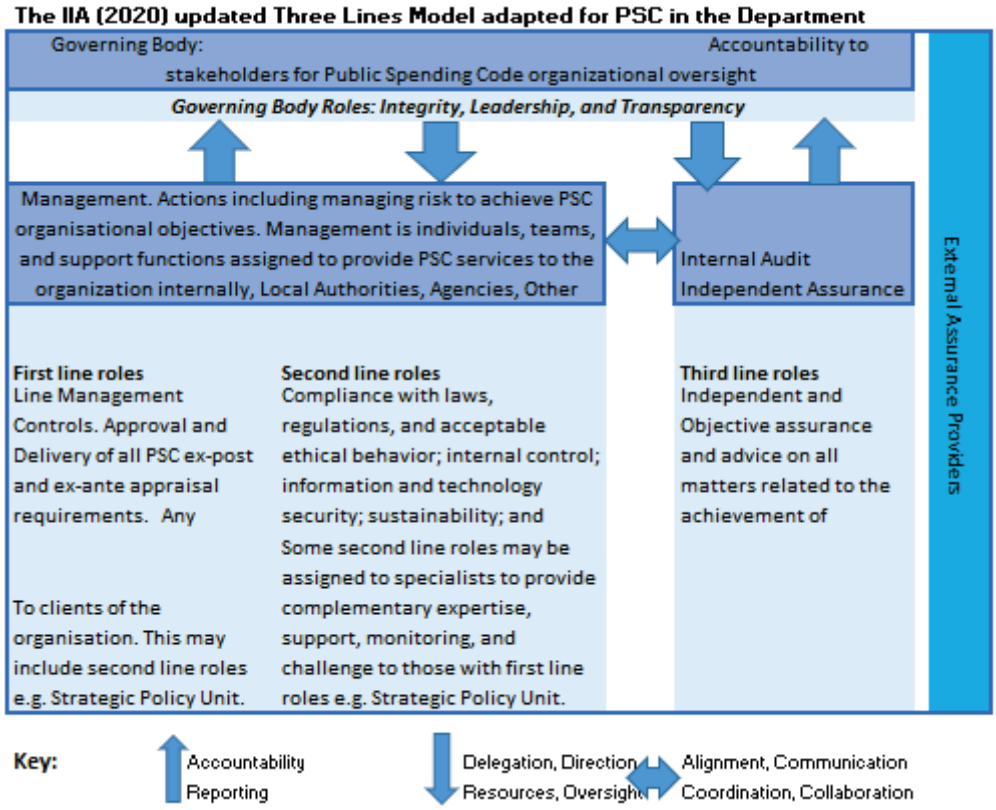


**Figure 4.14 Public Spending Code 3 Lines Model adapted from the Institute of Internal Auditors (IIA) 2020 updated 3 Lines of Defence Model, by Marita Gonsalves, Department of Housing, Local Government and Heritage, (author's own, unpublished) (2021)**

I was also aware that the timing of this Briefing Note was important if change and improvement was to be delivered. I knew it would not be presented until after the budget. A new Housing Strategy was being developed. I had seen an early draft of the underpinning financials for comment noting that they were manually prepared, and I started to think about how this process might be improved for all. These projects and future budget estimates, when agreed, would need to be updated into the national governance schedule of projects and programmes called Project Ireland 2040. I had raised the matter of

referencing our budget back to the declared future housing budgets already on Project Ireland 2040, this should have been possible, both for actual projects and longer-term budgets for future projects and I was told this was not to be done as many projects would not be even thought about yet. I advised I was seeking to build a future process through a case management system also through RPA budgets for Financial Appraisal.

I sought to expand the case management system to develop something that could be applied nationally for PSC and to link it to Project Ireland 2040 data and dashboard reporting.

2. Using the OC+AG PSC financial management maturity assessment, Project Ireland 2040 database and accompanying Geohive Project Ireland 2040 map and commencing development of a new Build to Share a case management system tailored for PSC - e-PSC

Project Ireland 2040 was accompanied by a digital tool called the Geohive Project Ireland 2040 map. This map was useful. I noted that there were far more projects on this map and no programmes, that there wasn't a clear process for updating the project Ireland 2040 register for projects colleagues are aware of and approving. Projects not listed on the project Ireland 2040 register were on this map.

I also noted that this document was updated through a manual process. I began to think about manual processes for PSC and the benefit of a bespoke case management system. I discussed this internally and with ICT manager colleagues, also with DPER NIO and all were enthusiastic about this. I then thought it would be of benefit as a national build-to-share system which could be used by all, and increase accountability and transparency, also reducing the risk of multiple versions or different versions of the same documents potentially being reviewed, which possible to happen because of multiple emails.

Although there is already a national electronic records management filing system called e-Docs, for anyone on the OGCIO Build to Share Platform I felt that something similar would be of benefit and could facilitate Project Ireland 2040 dashboards and metrics and PSC reporting requirements including annual quality assurance reporting.

I agreed a joint project with DPER NIO, identified the case management tool headings and reporting requirements needed by the Department and DPER NIO. I contacted the OGCIO Build to Share (BTS) team. In the initial meeting they identified a case management system which they considered might be suitable for tailoring specifically to PSC requirements, that it could be adapted and become bespoke for PSC, called e-PSC.

I knew this was needed to support PSC governance. Building in quality assurance reporting obligations to publicly report on all expenditure over €5m being considered, being incurred, and recently ended, a schedule of projects and programmes at all appraisal stages, and the reporting requirements for exchequer grants would make e-PSC output user friendly.

The IMF., (2017), had recommended improvement to the Project Ireland 2040 tracker, having undertaken a detailed appraisal of Ireland's public capital investment system, using the IMF, Public Investment Management Systems (PIMA), and had concluded that there were opportunities to achieve greater value for money from public capital investment in Ireland'. They had noted weaknesses in infrastructure assets accounting, had recommended the, then, PSC review be used to harmonize, update, and extend appraisal methodologies and parameters, make it more accessible to users, and align it with complementary guidance, in terms of allocating investment and monitoring investment projects they recommended:

> "Develop the Capital Tracker database as a tool for forecasting investment requirements to:(i) ensure that the annual profiles of approved projects fit within the available capital expenditure ceilings; (ii) improve the allocation of unapproved projects; and (iii) track the progress of projects that are underway.
>
> Further develop the Capital Tracker database to provide more comprehensive information on: the annual cost pro file; implementation of project including a clear separation of capital and recurrent costs; and data on adjustments to project design and costs, implementation delays and result." 470

The further development hadn't happened yet. There was scope to introduce and implement through e-PSC. An opportunity. Could AI, machine learning and robotics help with this? What governance of ethics implications might arise?

Was the PSC more accessible to users? Aligned with complementary guidance? My initial 'Aide Memoire' noted the alignment with the Capital Management Works Framework but noted the apparent understanding that 'current expenditure' was excluded from PSC evaluation.

I also noted that PSC was clearly not aligned with the national Project Management Guide in people's thinking. None of those templates were used in the documentation for the case studies I checked, and internally, our Internal Audit unit had commented on the total absence of any PSC documentation on files. Their conclusion was not that PSC work wasn't being done, but that it wasn't being documented. I had already raised this in terms

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470 IMF, Renteria, Carolina., Harris, Jason., Allen, Richard., Groom, Simon., (2017), Ireland, Technical Assistance Report, Public Investment Management Assessment, Pages 9, 10, and 11. Published by the IMF, Renteria, Carolina., Harris, Jason., Allen, Richard., Groom, Simon., of the Fiscal Affairs Department, IMF Washington D.C. USA, Available at : https://infrastructuregovern.imf.org/content/dam/PIMA/Countries/Ireland/Documents/IrelandPIMATAR.pdf (Accessed 26 February 2022) link on webpage https://infrastructuregovern.imf.org/content/PIMA/Home/Region-and-Country-Information/Countries/Ireland.html (Accessed 26 February 2022)

of PSC Quality Assurance and public reporting of the Department in the period from the year ended 31 December 2014 to date, so this finding supported that observation.

I had also noted that the up-to-date PSC capital documentation still referred to Evaluation documentation from 2012 but not any new guidance in the EU, and the other PSC guidance, for example, the RIA guidance, dated 2009, did not take into account the EU contemporary guidance for RIAs. Financial Appraisal as noted before was still manual. In an environment with AI, continuous accounting and so much financial information.

Was the PSC more accessible to users? Internally there was a lot of confusion. Externally it was difficult to ascertain. I sought to learn more about the citizen voice in PSC in Cycle 3.

### 4.6.3 Data Gaps and the birth of a bespoke PSC case management tool for national use

> *Collect evaluative data and analyse it.* What is happening in this situation now as understood by the various participants? Using research methods, what can we find out about it?

1. Example Case Studies of existing PSC issues in the Department as approving authority, including impact nationally, for our Agencies and Local Government and the EU and briefing note for management board.

The case studies are documented but have not been included in the briefing to management board. They were initially all removed from that briefing. I was asked to reinsert one case by way of example and retain the others for use when we meet with management board.

The IMF 2017 recommendations for further development were not delivered. AI enabled PSC wasn't in evidence. But there was opportunity to introduce this as part of a new case management system, e-PSC

2. Using the OC+AG PSC financial management maturity assessment, Project Ireland 2040 database and accompanying Geohive Project Ireland 2040 map and commencing development of a new Build to Share, a case management system tailored for PSC - e-PSC

Orlikowski, W., J., (1993) had emphasised the importance of Computer-Aided Software Engineering, (CASE) tools, as a form of organisational change over time and not merely the installation of a new technology, and that any new technology affects business users as well as the Information Systems unit, and its introduction and usage requires senior and middle managers of the business units to champion and motivate the organisational changes required around fundamentally different information systems products, and that

as primary users of the products, business units may need to change their business process, policies and norms, also noting that researchers should consider the social context of systems development, the intentions and actions of key players, and the implementation processes followed by the organisation, referencing the interpretative nature of such research.471 This work influenced my thinking, for the case management system e-PSC, and the more radical systems thinking of Governance by AI and Robotics augmented Citizen Voice.

Building the e-PSC register was an exciting exercise. I scoped the headings I considered would be needed including all types of appraisals. I added in the requirements of the annual quality assurance reports. I then added in the headings my colleagues on the Strategic Policy team wanted and after that the headings colleagues from DPER NIO wanted. I had identified many projects managed by the Department, which weren't included. The reasons for same needed to be understood but also, the benefit of a case management system was ever more evident. There was scope to extend the register to all entities on the BTS network, indeed over time, to all Public Sector entities.

I worked with colleagues to insert any project/programme expenditure data I had sourcing initially from Project Ireland 2040. DPER NIO agreed to the use of Project Ireland 2040 dashboard and metrics, and they provided an unlocked version specifically for the OGCIO BTS team. I added in local government schedules of projects/programmes

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471 Orlikowski, Wanda., J., (1993) *CASE Tools as Organisational Change: Investigating Incremental and Radical Changes in Systems Development.* Pages ii, 1, 4 and 37. Published by Orlikowski, Wanda., J., Sloan School of Management, Massachusetts Institute of Technology, Cambridge, Massachusetts, USA. Available at: https://dspace.mit.edu/bitstream/handle/1721.1/2475/1/SWP-3579-45082634.pdf (Accessed 19 August 2021)

published by the NOAC in 2018 and 2019. The BTS team had been fantastic in that they took all the headings I had suggested and showed me how they would be better presented for end-users in e-PSC, their skills coming to the fore in that.

I felt that this process would highlight any specific headings that local government used beyond PSC obligations which we might be able to incorporate into e-PSC. I had noted that they segregate exchequer grant funding which would be useful in exchequer financial appraisal if everyone did this. The Project Ireland 2040 GIS map identified 782 projects was also a fantastic tool and in September, I added that data in too.472 So much opportunity.

I completed the OC+AG financial management maturity assessment PSC question concluding that, the Department PSC maturity level assessment was improved because of the risk mitigation of RPA financial appraisal and the digital tool, e-PSC. This assessment is incorporated into the management board briefing.

At this point engagement is ongoing and very positive, an initial scope of what the system would look like has been agreed and the OCCIO BTS team is adapting an existing BTS case management tool to become a bespoke tool for PSC. I highlighted the grants management circular and asked if a column could request confirmation that this was completed. This work is ongoing. I brought this work to the attention of the DPER NIO

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472 DPER (2021) *Project Ireland 2040 'myProjectIreland' mapping tool.* Published by DPER, Dublin, Ireland and ArcGIS.com ArcGIS maps, California USA and ESRI Dublin, available at https://geohive.maps.arcgis.com/apps/webappviewer/index.html?id=26b6e93dcd1044ff8fa2bd1a772a6080 (accessed 04 March 2022)

National Action Team through our Department representative in August 2021. There is a lot of support for this work and case management system.

### 4.6.4: Review the data and look for contradictions: Conflicting data in the public domain and more data gaps, beginning to think about AI and continuous accounting and continuous budgeting opportunities

*Review the data and look for contradictions.* What contradictions are there between what we would like to happen and what seems to happen?

1. Example Case Studies of existing PSC issues in the Department as approving authority, including impact nationally, for our Agencies and Local Government and the EU and briefing note for management board

The Department has a governance role for the local government sector in terms of policy. Local government is "the main vehicle of governance and public service at local level - leading economic, social and community development, delivering efficient and good value services, and representing citizens and local communities effectively and accountably."473

Delivery of Public Spending Code is part of this. It is important that all submissions to the Department provide evidence for the decisions made under the PSC by the Members of local government and demonstrate compliance with the PSC. Review of this is managed through the NOAC, the Department Agency tasked with oversight of this area. The NOAC submits annual quality assurance returns but make no comment as regards appraisals.

473 Department of Housing, Local Government and Heritage., (2012), *Putting People First Action Programme for Effective Local Government* Page iii available at gov.ie - Putting People First - Action Programme for Effective Local Government (www.gov.ie) (Published 05 October 2012, website last updated 05 March 2019).

Projects on their published records for expenditure being considered and being incurred were not on Project Ireland 2040. How could we prevent this occurring again in the future? AI RPA? Blockchain and grant management?

2. Using the OC+AG PSC financial management maturity assessment, Project Ireland 2040 database and accompanying Geohive Project Ireland 2040 map and commencing development of a new Build to Share, a case management system tailored for PSC - e-PSC

Initially I used the data available in the Department, but this was limited. The only data available was in a note in the Appropriation Account. The latest available financial data was for the year ended 31 December 2019. This was in September 2021. I noted 3 major projects were excluded from the 2018 Appropriation Account, recorded in the Appropriation Account of 2019.474 So I used the Project Ireland 2040 register to populate, also the local government PSC schedules of expenditure reported annually, later adding in a database on an associated mapping tool which recorded projects under €20m which related to the programmes recorded on Project Ireland 2040. The OGCIO populate e-PSC with that data. I had also introduced the ICT lead of an Agency called the Local Government Management Agency (LGMA) to the OGCIO Build to Share team with a view to their exploring how the LGMA could move onto the OGCIO shared services. In time this would facilitate data sharing between all local authorities and through them their companies and other bodies, and e-PSC.

474 OG&AG (2021) Appropriation Accounts year ended 31 December 2019. Vote 34, Page 17 Published by the OG&AG Dublin, Ireland at https://www.audit.gov.ie/en/find-report/publications/appropriation%20accounts/appropriation%20accounts%202019.html and Vote 34 https://www.audit.gov.ie/en/find-report/publications/2020/vote-34-housing-planning-and-local-government.pdf

We have good digital tools for mapping, a fragmented capital project appraisal and delivery approach, structural legacy problems as reported by the OECD, IMF, OG&AG and most recently by the EU and DPER, all transparently reported. Why wasn't change happening? We have a lot of financial information but not AI enabled. I reflected on those contradictions, and on the IMF Global Financial Stability Report, 2021, which refers to Coronavirus Disease 2019 (COVID-19) and the extraordinary policy measures which have eased financial conditions and supported the economy, helping to contain financial stability risks. The IMF identify emerging themes and risks including:

- First, there is a risk that an asynchronous and divergent global economic recovery—especially if accompanied by a move toward policy normalization in advanced economies and rapidly rising interest rates—may result in tighter financial conditions and large portfolio outflows in emerging market economies.
- Second, highly accommodative financial conditions may have unintended consequences. If not addressed, financial vulnerabilities exposed by the pandemic may become new structural legacy problems.475

Could we be looking at continuous accounting and continuous budgets? Ethics decisions, setting the expenditure judgements made e.g. bad debt amount? 2% of expenditure and materiality? AI enabled procurement exists today.

The IFAC., and CIPFA., (2021), report on adoption of accrual accounting. Rob Whiteman, Chief Executive of CIPFA stated "Accrual-based accounting is essential to help governments mitigate corruption, improve trust and transparency, in the post-pandemic

475 IMF (2021) *Global Financial Stability Report: Pre-empting a Legacy of Vulnerabilities.* Chapter 1, Page 1. Published 06 April 2021 IMF, Washington DC, USA, Available at https://www.imf.org/en/Publications/GFSR/Issues/2021/04/06/global-financial-stability-report-april-2021 (Accessed 19 August 2021)

world" and Kevin Dancey, IFAC CEO, stated that "This continuing shift from cash to accrual reporting in the public sector, and increased usage of IPSAS in particular, will be crucial to governments globally in making the tough choices they face following the pandemic. Professional accountants have a critical role to play in delivering the full potential benefits for citizens worldwide in terms of decision making, transparency, and accountability. And that by 2025, governments in 50% of jurisdictions will report on an accrual basis 476 The IFAC and the Chartered Institute of Public Finance and Accountancy (CIPFA) (2021) also stated that Accrual reporting, recording the economic substance of transactions when they occur rather than when cash settlement happens, is fundamental to good decision making, transparency and accountability"477 and report that Ireland sets its' own financial reporting standards. 478

476 IFAC, and CIPFA., (2021), *Global Public Sector Shift to Accrual Accounting Forecast to Continue*. Paragraphs 1, 4 and 6. Website. Published 16 June 2021 by the IFAC New York, USA. and CIPFA, London, UK, on https://www.ifac.org/news-events/2021-06/global-public-sector-shift-accrual-accounting-forecast-continue (Accessed on 19 August 2021)

477 IFAC, and CIPFA., (2021), *International Public Sector Financial Accountability Index Website* Paragraph 1.Dated 16 June 2021 by the IFAC New York, USA. and CIPFA, London, UK, on https://www.ifac.org/knowledge-gateway/supporting-international-standards/discussion/international-public-sector-financial-accountability-index-2020

478 IFAC, and CIPFA., (2021), *International Public Sector Financial Accountability Index.* Page 3 Report Published 16 June 2021 by the IFAC New York, USA. and CIPFA, London, UK, on https://www.ifac.org/knowledge-gateway/supporting-international-standards/discussion/international-public-sector-financial-accountability-index-2020

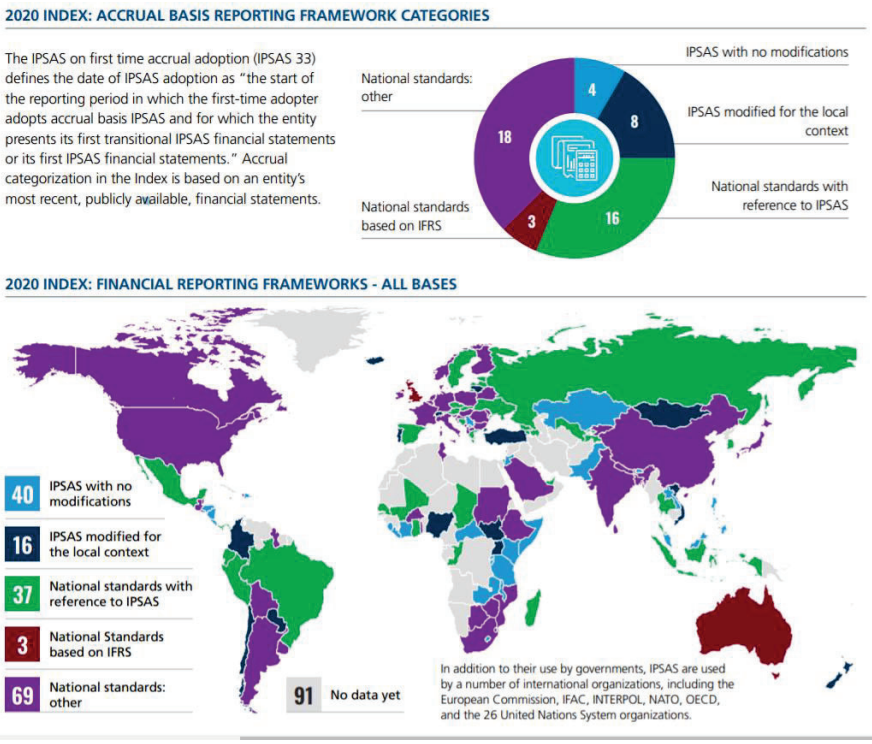


**Figure 4.15, IFAC and CIPFA (16 June 2021)** ***International Public Sector Financial Accountability Index***

The EU is introducing EPSAS for member states and Ireland is working towards implementing same which will harmonize financial accounting and financial reporting. This is a perfect time to consider an AI enabled financial voice in budgeting and PSC Policy appraisal.

### 4.6.5 Introducing change e-PSC – a promising digital tool

> *Tackle a contradiction by introducing change.* By reflecting critically and creatively on the contradictions, what change can we introduce which we think is likely to be beneficial?

1. Example Case Studies of existing PSC issues in the Department as approving authority, including impact nationally, for our Agencies and Local Government and the EU and briefing note for management board

Work on case studies collection is expanded to include examples sourced from other Divisions in the Department outside of the three Housing Divisions and Planning Division, to consider one Division which has recently transferred to the Department and one Division where there is significant grant expenditure not managed though the local government sector to establish if there are different approaches in Divisions with different backgrounds.

2. Using the OC+AG PSC financial management maturity assessment, Project Ireland 2040 database and accompanying Geohive Project Ireland 2040 map and commencing development of a new Build to Share, a case management system tailored for PSC - e-PSC

Development of a bespoke PSC case management tool, e-PSC, emerged from undertaking Cycle 1 and is a very promising tool. It will being change and improvement both internally in our organisation, with the NIO and through the work of the national Action Team, potentially to a much wider audience in the coming months.

This work is progressing. In August in response to a request for comment on an updated draft of the report of the Supporting Excellence Action Team, (where our Department representative had again noted that the team's purpose is to pave the way for structures to support, develop and modernise the State's capital delivery (NDP) practices) that it was close to the final draft report as there is only one meeting left, so probably this was the last opportunity to influence it. With the approval of my line manager, I updated the draft report to incorporate the work relating to e-PSC case management system. I noted, that although they were aware of the work on Financials and RPA being done with DPER NIO and DPER RPA team, there was no mention of this in their latest draft report, but also noted the new pilot course set up by DPER RPA I applied for that route for developing the

RPA Exchequer Appraisal and started to consider the basis for the budgets for machine learning, including Project Ireland 2040, Ireland's financial database and the EU and IMF financial datasets.

In September 2021 the OGCIO reported this project as a joint project. The OGCIO BTS team emailed to update noting that there was a lot of interest in the ePSC project which was great news. I was delighted. Many colleagues were working hard on this and aware of PSC but struggling with the manual processes, evidenced by the exclusion of major projects from the financial statements, which would indicate sup-optimal internal reporting mechanisms. Were there other exclusions? Working with the NOAC PSC returns and Project Ireland database indicated yes. e-PSC would substantially improve data gathering and analysis, inform policy making and performance reporting. The DPER NIO had separately indicated to me in September 2021 that they would provide me with a draft of their new financial appraisal guidance, and I began to think how these two actions could be integrated whether that was possible.

> The DPER, NIO, (2021) report and recommendations states:
> "It is clear that additional digital tools are required to assist public bodies in managing delivery and its associated governance and risks, and it would substantially improve data gathering and analysis to inform policy making and performance reporting. It would also afford the opportunity to integrate the requirements of the Public Spending Code and the Capital Works Management Framework. Such a system could be deployed progressively and in a targeted fashion as functionality is developed."
>
> Recommendations 31 "Issue further Public Spending Code guidance to support delivery of projects (e.g. financial appraisal, programme appraisal etc.) (NIO). 33 "explore the option for establishing a digital platform to assist public officials in developing projects through the delivery phases. (DPER NIO, GCCC [Government Contracts Committee for Construction], OGCIO"[479]

479 Supporting Excellence Action Team, DPER., (2021), Supporting Excellent Action Team report – Strengthening Delivery Capability for Project Ireland 2040 Report from the Supporting Excellence Action Team. Pages 20 including recommendations. Published by

By 28 November DPER NIO had not yet shared that Financial Appraisal guidance and I decided to progress that aspect through continuous accounting and budgeting in Cycle 6. But great progress had been made in relation to the Build to Share (BTS) digital tool formerly called e-Case now renamed, ePSC. I had worked with DPER OGCIO and my team to scope and with the OGCIO develop first by setting out all the PSC requirements in excel, then drafting to show as a Word document and the underpinning database requirements in the required format in excel. This could not have been done without my team which included someone with experience in databases and coding and knew how to present the vision in the format required by the OGCIO to develop.

Three of us worked to populate with test cases of imaginary housing projects, to determine what needed to be done to make this bespoke case management tool usage as easy as possible for all end users and we modified to simplify and linked to active directory so those inputting could also show the project owners. I had access to the BTS test environment, granted by the OGCIO for this purpose, and I used this to set up notes where I had queries when inputting test data, also to test the reporting.

The next steps are to share with the Strategic Policy team end of November and in December and then with a recently formed group of Principal Officers in the Department who were tasked with considering how to apply PSC for multi-tenure housing projects and align with other guidance including the capital management works framework (CWMF) and report to the management board in relation to same.

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DPER, Dublin, Ireland available at https://www.gov.ie/en/publication/77fe2-national-development-plan-phase-1-report-2021/ (accessed 28 November 2021)

This happened with the Strategic Policy Team end of November, and I advised the Multi-Tenure Committee in November about this digital platform. This group was also tasked with developing PSC sectoral guidance for multi-tenure housing projects. I also advised the Department representative on the Supporting Excellence Action Team on 28 November 2021. Management Board approved a report including use of e-PSC in 2022.

### 4.6.6: e-PSC is under consideration as a national project

*Monitor the Change: What happens day by day when the change is introduced?*

1. Example Case Studies of existing PSC issues in the Department as approving authority, including impact nationally, for our Agencies and Local Government and the EU and briefing note for management board

At the time of writing 04 September 2021, the briefing note for management board remains with the Assistant Secretary. My colleagues are aware that there is focus on the PSC appraisal processes. Engagement with DPER is increasing in terms of finalizing sectoral guidance.

Our Assistant Secretary still hadn't released the draft report provided in June 2021 to management board my line manager and I discussed and made the decision to summarise the report issues and recommendations and provide to the group. The recommendations were provided but not shared with the external representative on the group as the report related to how the Department manages PSC. I also kept the group updated about progress with the BTS tool e-PSC also noting that it can link to Project Ireland 2040 database reporting.

By November 19 I had advised it would be available for them to review for any additional requirements. They were also aware through my update that DPER NIO was being shown the test environment product in final form end of November with a view to using it across other Departments.

2. Using the OC+AG PSC financial management maturity assessment, Project Ireland 2040 database and accompanying Geohive Project Ireland 2040 map and commencing development of a new Build to Share, a case management system tailored for PSC - e-PSC

**Action 2: Establishing a Digital Platform for PSC, e-PSC Build to Share case management system now also for rollout to Departments more widely through DPER NIO- ongoing**

Developing e-PSC is a positive experience. DPER NIO provided the data they needed for the case management system. My colleagues on the Strategic Policy Team also included the information they needed. The project data for e-PSC was provided with my teammates and together we are exploring how to roll out this case study management system, with initial data in it, asking our colleagues for information on any bespoke reporting colleagues may need is due Q1 2022.

Information enabling supporting annual certification of compliance with the obligations Circular 13/2014 on grants management is now included in e-PSC as a report.480 Public Servants approving expenditure as all grantor entities and recipients of grants are required to annually certify compliance with procedures. This certification isn't published but will assist monitoring the flow of Exchequer Funding through the tiers of

480 Note: Exchequer Funds Grant budget data is now also introduced as part of Project Ireland 2040 Project and Programme Tracker since October 2021. This is a welcome step in Transparency. See Cycle 6.

Government, and beyond into other bodies if circumstances apply. The involvement of the PSC Supporting Excellence Action Team PSC Action Team of this project and the involvement of DPER NIO is welcomed.

### 4.6.7 Moving forward with E-PSC and handling emerging pushback

> *Analyse evaluative data about the change.* What is happening in this situation now – as understood by the various participants – as a result of the changes introduced? Using research methods what can we find out about it?

1. Example Case Studies of existing PSC issues in the Department as approving authority, including impact nationally, for our Agencies and Local Government and the EU and briefing note for management board

The PSC process advice provided by DPER formed part of the detail in the case studies. I noted however within the Department an increasing resistance to comply with the process, blaming fragmentation and others, for confusion re accountabilities and poor engagement. This was familiar to me. As an Auditor almost every audit included engagement where the words 'the previous Auditor never asked for that/was happy with the process', 'I am new to the role', 'that happened before my time I know nothing about it', all observations which come from resistance to change. For many, the PSC has not been subject to self-assessment for years, has not had public quality assurance reports, staff hadn't been trained in technical appraisal. I had previously sought to automate PSC appraisal processes but at that time there hadn't been support internally for considering AI and RPA for PSC policy process, even with the significant expenditure, currently a manual process, time consuming and really can be done in an easier way. Having said that, it is important to note that my colleagues were open and transparent about the PSC challenges,

approved wording in the case studies, and enthusiastic about any process that would make PSC process easier.

Bagher Asgarnezhad, N., Masoume Mir, M., and Milad, S., (2016), discuss brand citizenship behaviour, noting that it is a new concept that explores the volunteer activities and activities which are outside the official duties of employees in organization's brand. Their research identified the relationship between internal branding brand citizenship behaviour and customer satisfaction in the banking industry of Iran and that one of the main factors in customers choosing a bank is the good relationship and behaviour of employees, particularly at branch level with customers. They concluded if bank employees do not believe the bank brand and its importance in the success of the bank as a whole and that they themselves are a part of this whole, they will not be able to strengthen the bank's brand.481

This made me think about the Public Service, and Brand PSC also about how to support by colleagues and the wider public service, through AI and RPA financial appraisal, also a PSC case management system e-PSC. Could they help both in a practical sense and improve 'Brand PSC.'

2. Using the OC+AG PSC financial management maturity assessment, Project Ireland 2040 database and accompanying Geohive Project Ireland 2040 map and commencing development of a new Build to Share, a case management system tailored for PSC - e-PSC

481 Nouri, Bagher Asgarnezhad., Mousavi , Masoume Mir.,and Soltani Milad (2016) Pages 1 and 9 Internal Branding, Brand Citizenship Behavior and Customer Satisfaction: An Empirical Study (Case Study: Keshavarzi Bank of Ardabil). Published by available at http://www.cscanada.net/index.php/ibm/article/view/8809 (Accessed 20 August 2021)

The ePSC project is commenced. Internally it will support delivery and move appraisal from multiple iterations on email and will facilitate cross-government access in the same way as other BTS products such as e-PQs (Parliamentary Questions). In 2017, the IMF made recommendations in relation to the Project Tracker and Jenkinson, F. of IGEES (2018) in referencing the IMF PEFA report recommendations for the Tracker, also set out the rationale for the tracker that the tracker provides the public, businesses and other stakeholders with reliable information about current and future infrastructure investments in Ireland, and would be used by many different stakeholders for many differing purposes, including

- "The Government – to monitor implementation of the National Development Plan.
- The Project Ireland 2040 Delivery Board – to inform decisions on strategic direction.
- DPER – to help plan and manage capital expenditure requirements.
- Line Departments – to improve planning and coordination of public investments.
- Regional Assemblies – to inform Regional Spatial and Economic Strategies.
- The Construction Sector – to identify opportunities and plan for the required capacity and support the work of the Construction Sector Group.
- Private Companies – to inform decisions on where to invest and locate.
- The Public – to find details relating to public investments in their area, and to better understand how the elements of the National Development Plan are relevant for their community and region."

The Project Ireland 2040 Tracker was noted as having the potential over time to "become particularly useful flagging projects which are facing difficulties in relation to their delivery" that "in such instances it may then be possible to reallocate the funding to

other priorities which are in a position to be progressed." The next improvements identified were set out as introducing "1. Yearly breakdown of projected cost profiles of projects and programmes. 2. Information on project delays/cost inflations/design changes. 3. The inclusion of infrastructure projects being undertaken by semi-state companies e.g. Airports, Ports, Universities, Energy Infrastructure etc.". Also, 2. work is ongoing to establish a web-based portal to further facilitate the uploading of data by Departments and provide greater functionality and user-friendliness. 482 This hasn't happened to date in 2021. E-PSC will be able to deliver for all stakeholders.

By September 2021 OGCIO advised there was a lot of interest in e-PSC in other government Departments. DPER NIO requested a meeting with the OGCIO BTS team to see how e-PSC can be adapted for the benefit of Project Ireland 2040 reporting and also, rolled out to Departments more widely.

At the same time as this research was happening the Department was developing an ICT system for housing programmes management. This ICT system had been scoped without hardwiring in PSC gates or longer term budgets. In 2019 a PIN had been published, which stated:

> "The Department of Housing, Planning and Local Government (DHPLG) holds responsibility, for the strategic delivery of housing in the Republic of Ireland. Currently DHPLG operates a complex and fractured ICT environment which is inefficient and does not support their processes adequately. DHPLG intends to go to market with an RFT when their business requirements are fully defined and

482 DPER, IGEES, Investment project and programmes office, Jenkinson, Fionn., (2018) *Project Ireland 2040 Investment Projects and Programmes Tracker Overview and Analysis* Pages 3, 4, 13. Jenkinson, Fionn., DPER, IGEES, Investment project and programmes office Dublin, Ireland. https://assets.gov.ie/5253/211218172225-3ad41a41a72d48afaf1f40cf8ccd4c2a.pdf (accessed 20 August 2021)

agreed. In order to inform the definition of these requirements this RFI is being published to gather market information regarding potential solutions. 483.

The accompanying call for market information in 2019 had also stated "In addition, their current solutions are neither as secure nor as resilient as required".

> The Department of Housing, Planning and Local Government (DHPLG) holds responsibility for the strategic delivery of housing in the Republic of Ireland as well as oversight of the key mechanism for the delivery of social housing by local authorities (LAs) and approved housing bodies (AHBs). Along with housing, DHPLG is responsible for a number of other areas, some of which are inter-related and co-dependent on one another for success.
> Currently DHPLG operates a complex and fractured ICT environment which is inefficient and does not support their processes adequately. In addition, their current solutions are neither as secure nor as resilient as required. DHPLG intends to go to market with an RFT when their business requirements are fully defined and agreed. In order to inform the definition of these requirements this RFI is being published to gather market information regarding potential solutions."484

This Department is a very high spending Department. With insecure systems? By late 2021 the Department still hadn't gone out to tender, so there was scope to influence, to add in PSC into the fabric of the system if it was really needed in addition to e-PSC. I

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483 DHLGH (2019) IHW029C Prior Information Notice, (PIN) relating to the implementation of an ICT System for the management of Housing Programmes for the Department of Housing, Planning and Local Government at https://irl.eu-supply.com/ctm/Supplier/PublicPurchase/155145/0/0?returnUrl=ctm/Supplier/PublicTenders&b=ETENDERS_SIMPLE (accessed 13 September 2021) also Public RFT - Prior Information Notice relating to the implementation of an ICT System for the management of Housing Programmes for the Department of Housing, Local Government and Heritage (eu-supply.com) and Publication (eu-supply.com) (accessed 26 February 2022)

484 DHLGH (2019) eTenders IHW029C Request for Market Information relating to the implementation of an ICT system for the management of Housing Programmes for the Department of Housing, Planning and Local Government at https://irl.eu-supply.com/ctm/Supplier/PublicPurchase/155131/0/0?returnUrl=ctm/Supplier/PublicTenders&b=ETENDERS_SIMPLE (accessed 13 September 2021)

had noted that an updated PIN was issued in April 2021 relating to implementation of an ICT system for the management of Housing Programmes for the Department stating:

> The Department holds responsibility for the strategic delivery of housing in the Republic of Ireland that currently the DHPLG operates a complex and fractured ICT environment which is inefficient and does not support their processes adequately and that the DHPLG intends to go to market with an RFT in Q3 of 2020 seeking a solution485

I queried the above date and I also asked whether the system incorporated PSC requirements. It didn't. A financial management system that hadn't considered PSC financial appraisal, budgets, and expenditure? I was told this could be incorporated into the second version of the case management tool in about two years' time. Blockchain was now excluded from this project (project Díon). I'd originally in my former role sought to have RPA and Blockchain enabling this project. But my main concern was that financial management was not being considered in this major project.

If the Department considers e-PSC meets the SaaS housing project they might refocus it or stop it and that would save the taxpayer millions. E-PSC is a case management tool. So, I progressed with OGCIO and NIO.

### 4.6 8: A worthwhile digital policy tool and thinking about a future AI augmented Project Ireland 2040 budget for e-PSC

485 DHLGH (2021) eTenders PROJ000006890 – OGPSI002-002-201 - Prior Information Notice Prior Information Notice relating to the implementation of an ICT System for the management of Housing Programmes for the Department of Housing, Planning and Local Government at https://irl.eu-supply.com/ctm/Supplier/PublicPurchase/186308/0/0?returnUrl=ctm/Supplier/PublicTenders&b=ETENDERS_SIMPLE (accessed 13 September 2021) see also https://ted.europa.eu/udl?uri=TED:NOTICE:181046-2021:TEXT:EN:HTML&src=0

*Review the change and decide what to do next.* Was the change worthwhile? Are we going to continue it in future? What are we going to do next? Is the change sufficient?

1. Example Case Studies of existing PSC issues in the Department as approving authority, including impact nationally, for our Agencies and Local Government and the EU and briefing note for management board

Yes, drafting the case studies was worthwhile. It is easier when seeking to effect change to demonstrate the need change through examples of existing practice developed from discussion with colleagues about projects and belonged to the real world of project delivery.

Bell S., and Wood-Harper, T., (2007) stated about their own action research undertaken that 'in early meetings stakeholders often seemed uncomfortable at times with the descriptions of accepted or reported processes or procedures and when probed further about this, team members would often volunteer information (confidentially) that powerful stakeholders in that context were often, not keen to be complicit with apparent risks which could result in failures.' They noted the concerns expressed, included 'the more prosaic matters of information flow and delivery. 486 I reflected on this in the context of the case studies research and benefit of AI RPA financial appraisal and AI augmented reporting in e-PSC, the digital tool.

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486 Bell, Dr. Simon., and Wood-Harper, Professor Trevor., (2007) *Chapter 7 Story Telling in Action Research projects Malta, Bangladesh, Lebanon and Slovenia* Chapter 7 Page 178 Published by the Open University. and University of Manchester, New York: Springer, pp. 161–192. Available at the Open University at: http://oro.open.ac.uk/20892/ and https://www.springer.com/gp/book/9780387360591 In: Kock, Ned ed. *Information Systems Action Research: Bridging the Industry-University Technology Gap.* New York: Springer, pp. 161–192. **URL: http://www.springer.com/business+%26+management/bu...**

2. Using the OC+AG PSC financial management maturity assessment, Project Ireland 2040 database and accompanying Geohive Project Ireland 2040 map and commencing development of a new Build to Share, a case management system tailored for PSC - e-PSC

Ensuring ePSC, reports could be used for Project Ireland 2040 database reports because of GPS also both the preliminary budget and actual budget brings this reporting tool closer to Department budgets, and ability to report nationally in a useful way as well as internally. I had also advised the Department multi-tenure housing projects Committee that these reports could easily be cross-referenced with the NOAC PSC quality assurance reporting provided by all local authorities. The joined-up thinking beginning to happen. Now I started to think about how to deliver the accrual financials in terms of continuous accounting as the multi-tenure housing projects Committee had included that concept in the latest working draft of their brief but had stated management of expenditure on these projects/programmes was outside of their project brief, which was disappointing, but they had a deadline of early December and decided to focus on the pre-approval stages. I had mentioned about budgets and forecasts but still there was resistance to linking PSC approvals with specific 'expenditure under consideration'. They referenced continuous accounting, words I had often used. It was also important to think about how AI augmented budgets and forecasting. I devoted Cycle 6 to these aspects. And to seeing how AI could augment budgeting, forecasting and continuous accounting, knowing there was growing acceptance of both concepts.

Developing a PSC case management system for internal and wider use, in collaboration with OGCIO BTS team and DPER NIO is worthwhile and this work will continue in the coming months. When in use, with AI augmented financials, this change

will be transformative. The next steps include building an AI augmented budget for e-PSC using the financial data I had gathered in the public domain, populating the case management system with existing information and building a dashboard of reports, of benefit to all. This work is now at User Acceptance Testing. DPER NIO noted in November 2021 that it was being piloted in my department with a view to further rollout.

## 4.7 Cycle 3: Tales of Ethics, Governance of AI and by AI, and an AI Augmented Citizen Voice in Public Policy

### 4.7.1 Citizen Perspectives on AI ethics, governance, an AI augmented citizen voice in policymaking, delivery, and evaluation the Pulse of Citizen Voice

*Define the inquiry:* What is the issue of concern? What research question are we asking? Who will be involved? Where and when will it happen?

Cycle 3 'felt the pulse' of the existing Citizen Voice in Ireland and focused on citizen voice for one external group of accountants and a pilot course for senior leaders in the civil service 'Storytelling for maximum leadership impact." I had been invited by the Department HR section, to participate in the pilot.

Cycle 3 commenced engagement with external entities in relation to the existing consultation processes and public policy, and to obtain perspectives on AI ethics, and citizen voice in policymaking, delivery, and evaluation. This Cycle sought citizen perspectives on aspects of AI and governance, an AI augmented citizen voice, governance of AI and by AI, to pilot test the narrative for the AI augmented citizen voice data collection a new action, in addition to progressing the actions of Cycle 1 and Cycle 2.

This research asked the question, how does an AI governance framework benefit public policy?

In parallel with Cycles 1 and 2 research, I had been asked to speak about Public Policy at my Business Network Group a number of months ago and I decided, in tandem with my work developing a national case management system, to use this opportunity to raise awareness of the many ways a citizen could engage in Public Policy, to include PSC

in same, and through the Q+A session get a feeling for their views and experience of using their own Citizen Voice. I presented in May 2021.

The persons involved were a small group of chartered accountants, my Business Network Group, who had, months earlier asked me to present on my work as a Civil Servant, specifically on Public Policy. I agreed with the organisers and with my Department HR to present on Citizen Voice in Public Policy, existing voice and AI, a new paradigm, to focus on their perspectives on getting involved in governance of AI by crowdsourcing AI ethics and policy, and involvement in national Risk management consultations for example AI strategic risks facing Ireland referencing the DPER 'New Technologies Risk Assessment', potential uses for ESBI, the EU blockchain, for the commercial environment and by the public sector. I sought their views on a transparent but manual process in local government on the right to inspection of books and records, whether they were aware of this right, whether they had ever invoked this right, and whether we should reflect on how continuous accounting could improve this. Their views on AI augmented taxation policy (AI Economist) were also sought.

I had also been asked by my HR to take part in a pilot leadership course for senior management in the Civil Service during which exercise each person was asked to input for 5 minutes my input to be heavily based on story, one input session each day, I used these opportunities, to tell two AI ethics and Public Policy stories. The questions asked and request for follow up information made me realise citizen voice, governance by AI and ethics were areas I needed to focus on in Cycle 4, Cycle 1 was progressing RPA and Financial Appraisal, Cycle 2 a national PSC case management system, and Cycle 4, AI augmented citizen voice.

Could Citizen Voice in Public Policy process be augmented by AI? What are public servants and citizens understanding of AI and ethics in the context of governance by AI and perhaps, an AI Robot Citizen?

### 4.7.2 Citizen Voice shaping AI ethics and Artificially Intelligent Corporate Governance today

*Describe the situation:* What are we required to do here? What are we trying to do here? What thinking underpins what we are doing?

Citizen voice is important, in local government citizens are represented by elected Members. Citizens can examine all financial statements and related books and records within a given statutory period, an opportunity not available in central government, they can be involved in participatory budgeting, and through the consultation processes can be involved in policy development, monitoring and review, both locally, nationally, in the EU and globally. Citizens have the right to view all PSC documents that are required to be published.

Citizen engagement had been sought at the time of development of the National Development Plan (NDP) and National Planning Framework the two documents of Project Ireland 2040. And citizen engagement was again sought for the mid-term reviews of the NDP. The consultation page states:

"The review of the NDP provides an opportunity to reassess investment plans, update project costings and highlight any new issues which may need to be taken into consideration, particularly in light of the new Programme for Government and the ongoing impacts and recovery from Covid-19.
This consultation offers all people in Ireland - expert stakeholders and users of infrastructure - the opportunity to inform and influence important policy that affects the fabric of our daily lives including the distribution of our people, our jobs, businesses, houses, roads, public transport, education and health infrastructure; our social, cultural and sporting facilities.

The review will not be considering the merit of individual projects or sectoral policy strategies as this is a primarily matter for individual Departments and Agencies. Individual projects are selected based on a detailed process which begins with Departments or Agencies setting their own sectoral strategy and goals, and then subsequently identifying specific needs or challenges to be addressed, whether that be through education, regulation, taxation or potentially expenditure on an infrastructure project."487

**Figure 4.16** ***Review to Renew - the public consultation of the Review of the National Development Plan.*** **Published by DPER, Dublin, Ireland**

In my conversations with colleagues, citizen views had never been discussed, the views of DPER, Ministers, Local Authorities, Government Agencies, expert stakeholders, are evident in the various stages of PSC appraisal, but citizen voice isn't. Yet citizen voice is a fundamental part of public policy. Project Ireland 2040 NDP had been subject to consultation at commencement and mid-point. 948 citizens/groups/others had submitted

487 DPER (2020) Review to Renew - the public consultation of the Review of the National Development Plan. Published by DPER, Dublin, Ireland

Published on 3 November 2020, Open for submissions from 2 November 2020 Submissions closed 19 February 2021 Last updated on 4 April 2021 at https://www.gov.ie/en/consultation/d3f3a-review-to-renew-the-public-consultation-of-the-review-of-the-national-development-plan/ (Accessed 18 August 2021 Website last updated 04 April 2021)

observations to the initial consultation in 2017488 and 570 submissions were received for the mid-term review. I could not examine the second submissions as were being considered at this point (September 2021). The summary report noted the following as a conclusion that following the consultation:

> "Broadly, the evidence highlights areas where there are emerging and urgent infrastructure gaps which will need to be addressed as part of the 10-year strategy. However, in making decisions as part of Phase 2 and in building for the future, it is important that investment in our economy is well-planned, well-targeted and well-delivered. This focus on the delivery of efficient and cost-effective public infrastructure will need to be kept front and centre, to ensure Ireland achieves the desired objectives of the National Development Plan and the National Planning Framework. (Page 5) 489

I was invited to present to my Business Network Group of Chartered Accountants as part of their continuous professional development training and explored the concept of citizen voice and public policy seeking their views on a number of areas, the meaning of ethics, crowdsourcing AI ethics, their voice as citizens and financial specialists and whether and how they already used it in existing policy tools in Ireland, the EU and globally. They were interested in my career choice, my work, and they wanted to learn

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488 DPER (2017) *Submissions – Draft of Ireland 2040 – Our Plan* on https://npf.ie/submissions-draft/ (accessed 22 August 2021)

489 DPER., (2021), Phase 1 Report Review of the National Development Plan. Page 5. Published by DPER at

https://www.gov.ie/en/publication/77fe2-national-development-plan-phase-1-report-2021/ and at

https://www.gov.ie/pdf/?file=https://assets.gov.ie/137660/17f424e3-a359-4f5d-8fde-0ac9b987a568.pdf#page=null (accessed 22 August 2021)

more about their Voice in Public Policy. I used this opportunity to ask if anyone had been involved in the public consultation given it dealt with financials.

Feedback on that morning was that many were completely unaware of the opportunities for engagement as a citizen in public policy and intended to do so now as they had information on the means by which to do this. They were also very engaged in the concept of citizen voice and crowdsourcing AI ethics for autonomous vehicles. But I realised from this presentation that stories showing AI in action, in citizen voice, in climate change mitigation, in taxation policy, in autonomous vehicles ethical policy, was more effective, than discussing the abstract concepts of ethics and AI.

I used this knowledge to develop the next examples highlighting AI Ethics and dilemmas through the lens of Governance for presenting at a Pilot course I had been invited to for senior managers across the Civil Service 'Storytelling for maximum Leadership impact. The brief given was, to "deliver a five-minute talk to your team designed to ensure they understand a Civil Service value of your choice". I chose Ethics, told a story about a new ethical dilemma in policy- making, crowdsourcing AI ethics.

"Imagine you are driving on the motorway. A pallet falls of the back of the lorry in front of you. You can swerve to the left into a small car with an open top with a few people in it or to the right into a motor cyclist. Or you can crash into the pallet knowing that will be serious injury to you and your passengers? What would you have done? There is no right answer. You react to the circumstances.
But there is an answer in autonomous vehicles. We have to programme them to react. This involves ethical decisions; this is one aspect of AI ethics. These decisions for autonomous vehicles are decided by technical developers and as policy makers and through public consultation you are part of this ethics policy decision."

**Figure 4.17 Crowdsourcing AI Ethics, presented at the Civil Service 'Storytelling for maximum Leadership impact' senior management training pilot course (2021) scenario development by Marita Gonsalves**

The slides and narrative for my first story narrated at the pilot leadership course for senior management in the Civil Service evoked interest including an observation from DPER that they would participate in the 2021 ‘Global Ethics Day’ initiative.

The leadership story I narrated on the second day is below. I had piloted it in my team, also with HR both advised it made them think about AI governance in a new light and when narrated to the civil service course attendees (Assistant Principals, Principal Officers, and an Assistant Secretary) the reaction was incredibly positive about the need to be involved in shaping the new modes of Governance by AI, and AI citizen voice.

A story in 3 minutes: “VITAL and Sofia, Corporate Governance, Artificially Intelligent Corporate Governance today:

Hi. My name is VITAL. I am a validating Investment tool for Advancing life Sciences, Vital for short. I am a software programme. I am an algorithm. I work for a Japanese venture capital firm called Deep Knowledge Ventures Ltd. I am a member of its board of directors. I can Vote. I am the first ever software programme to be appointed as a board member. I make business decisions on therapies for age related diseases. In 2014 I helped make two major investments, both successful. I also highlighted risks of investment decisions in overhyped projects and saved my company from going under. I make logical decisions based on large datasets I review. I have been appointed. But am I legal? Can I be fired? A good question.
VITAL is machine intelligence operating as a Board Member. Would you accept VITAL’s Vote if he Vetoed a project?

And what about Sofia?
Sofia the Robot is a citizen of Saudi Arabia. She became the world’s first Robot Citizen in 2017. She isn’t on a corporate board of Directors. She is the first non-human to be given a UN title, Innovation Champion. Can she take part in consultations in Riyadh in the way we as citizens can take part in consultations on policy here, in the EU, in the OECD? If she responded to a policy consultation here, identifying herself as Sofia the Robot citizen would you take her views into account?

What is the liability or responsibility of AI as a Director? On a State Board? Is this possible? Should AI have the right to Vote on a Board of Directors?

**Figure 4.18 Corporate Governance, Artificially Intelligent Corporate Governance today presented at the Civil Service ‘Storytelling for maximum Leadership impact’ senior management training pilot course (2021) scenario development by Marita Gonsalves**

### 4.7.3 Could an AI augmented citizen voice support Ireland's national policy tool?

> *Collect evaluative data and analyse it.* What is happening in this situation now as understood by the various participants? Using research methods, what can we find out about it?

The PSC is described as "A responsive and evolving code". But was citizen voice evident in it? In updates? Anywhere? I have seen a consultation for Project Ireland 2040 and for the NDP update. But not for updating VFM processes. And yet, Citizens participate in Public Policy development, implementation, monitoring and evaluation. I had noted that the website indicated that all stakeholders had been consulted.

The DPER (2013 checklist updated 2018) consolidated version of the code states that "all Irish public bodies are obliged to treat public funds with care, and to ensure that the best possible value-for-money is obtained whenever public money is being spent or invested." And that "In September 2013, Departments and Offices were formally notified by circular that the Public Spending is in effect." Also, that:

> The Public Spending Code will change as needs be to incorporate new requirements, better practices and other revisions to keep the code relevant and as user-friendly as possible. Since the Code (PSC) represents an evolution of established VFM procedures, in which all Government Departments and agencies are stakeholders, a new model of consultation and quality-proofing is being introduced. Several elements of the Code (PSC) are flagged as "Consultation Drafts" and should be regarded as provisional for the present: these will not be formally instituted as binding elements until they have been subject to peer review by all relevant stakeholders. In particular, the Central Expenditure Evaluation Unit (CEEU) of the Department of Public Expenditure & Reform will engage actively with the broader evaluation community, in the public and private sectors and in academic life, to ensure that Ireland's Public Spending Code evolves to keep pace with best practice both nationally and internationally490

490 DPER (2013 checklist updated 2018) *Public Spending Code Consolidated Document Checklist Updated October 2018* Pages 1 and 6. Published by DPER, Dublin,

Were Citizens part of that consultation or Peer Review process? I could not see evidence of this. Are Citizens part of Peer Review process for all PSC updates? PSC is a key policy tool involving citizen input. Could an 'AI augmented' citizen voice help? Cycle 4 considered this question. Cycle 3 is the pilot research.

### 4.7.4 Citizen Engagement in new modes of Governance strengthening democracy today

*Review the data and look for contradictions.* What contradictions are there between what we would like to happen and what seems to happen?

DPER (2020), state "Effective citizen engagement better informs evidence-based policy and service design through strengthening democracy, providing accountability and demonstrating impact", but also noted that:

> "For these positive results to be achieved requires a cultural evolution in the way public services plan for, communicate with, and engage the public, with citizens as active agents of change rather than passive recipients. In terms of capacity building, the good practice and strong experience in managing citizen engagement initiatives that exists in some parts of government could be drawn on and shared to areas with less developed citizen engagement experience and expertise." 491

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Ireland, Available at https://govacc.per.gov.ie/wp-content/uploads/Public-Spending-Code-Consolidated-Document.pdf (Accessed 18 August 2021)

491 DPER., (2020), *Citizen Engagement in Our Public Service A review of four case studies* Page 6 and 20 Published by DPER, Dublin, Ireland on https://www.ops.gov.ie/app/uploads/2020/06/Citizen-Engagement-in-the-Public-Service-Review-of-Four-Case-Studies-June-2020.pdf (accessed 23 August 2021) sourced from IAP2. (2018).

They adapted a globally acknowledged spectrum of public participation from the International Association of Public Participation (IAP2)., (2018), who stated their Spectrum of Public Participation was designed to assist with the selection of the level of participation that defines the public's role in any public participation process, and that the spectrum is used internationally, and it is found in public participation plans around the world. 492 I noted that the adaption changed the meaning also that an AI augmented Citizen Voice is possible in all stages and sought to also explore this specifically in terms of empowering citizens.

INCREASING IMPACT ON THE DECISION →

| | INFORM | CONSULT | INVOLVE | COLLABORATE | EMPOWER |
|---|---|---|---|---|---|
| PUBLIC PARTICIPATION GOAL | To provide the public with balanced and objective information to assist them in understanding the problem, alternatives, opportunities and/or solutions. | To obtain public feedback on analysis, alternatives and/or decisions. | To work directly with the public throughout the process to ensure that public concerns and aspirations are consistently understood and considered. | To partner with the public in each aspect of the decision including the development of alternatives and the identification of the preferred solution. | To place final decision making in the hands of the public. |
| PROMISE TO THE PUBLIC | We will keep you informed. | We will keep you informed, listen to and acknowledge concerns and aspirations, and provide feedback on how public input influenced the decision. | We will work with you to ensure that your concerns and aspirations are directly reflected in the alternatives developed and provide feedback on how public input influenced the decision. | We will look to you for advice and innovation in formulating solutions and incorporate your advice and recommendations into the decisions to the maximum extent possible. | We will implement what you decide. |

© IAP2 International Federation 2018. All rights reserved. 20181112_v1

**Table 4.2 International Association of Public Participation (IAP2) (2018) *Spectrum of Public Participation 20181112V1* By IAP2 and Organizing Engagement (2022)**

492 International Association of Public Participation (IAP2). (2018), IAP2 Spectrum of Public Participation. Published by IAP2 Denver, Colorado, USA at https://cdn.ymaws.com/www.iap2.org/resource/resmgr/pillars/Spectrum_8.5x11_Print.pdf (Accessed 23 August 2021) and Organizing Engagement, New England, USA, (2022) available at https://organizingengagement.org/models/spectrum-of-public-participation/ (accessed 26 February 2022)

There was awareness of consultation processes in Ireland, in the EU and globally. I was very interested to hear in feedback from the Business Network Group members that I had presented to in Chartered Accountant Ireland, that they were engaged in the idea of being involved in developing AI ethics for autonomous vehicles also, with using their EU voice. I had highlighted that means of Citizen Voice engagement for consideration.

The EU (2021) conference plenary 2021 comprised 108 representatives from the European Parliament, 54 from the Council, 3 from the European Commission, 108 from all national parliaments on an equal footing and citizen, from European Citizens Panels, from National Citizens Panels and other. The quotes in the press release emphasized the EU citizen role and duty.

> Parliament's Co-Chair of the Executive Board, Guy Verhofstadt, said: "*We want to create real momentum from the bottom up. The Conference will be much more than a listening exercise, but a way to truly include citizens in mapping out our shared European future. The foundations have been laid: digital and deliberative democratic experiments that have never been tried on an EU-wide scale.*
> *We will guarantee that their concerns and proposals will then get a political answer. It's new and exciting, and it starts today*."
>
> The Portuguese Secretary of State for EU Affairs, and Co-Chair from the Presidency of the Council of the EU, Ana Paula Zacarias, said: "*Coming from Porto to Strasbourg, to celebrate Europe Day and the launching of the Conference on the Future of Europe, the words of President Mario Soares came to my mind when back in 1976 he defended: 'to rethink Europe and its future is a permanent duty of all Europeans. A joint endeavour that needs to be taken forward with humbleness facing the historic relevance of our common goals*."
>
> Commission Vice-President for Democracy and Demography, and Co-Chair, Dubravka **Šuica**, said: "*This Conference is an unprecedented exercise for the EU. We are creating a space where citizens can debate on a par with elected representatives to spell out the future of Europe. This has never been tried before, but we are confident that this will strengthen both our European Union and our representative democracy. And there is no better date to celebrate that than on the 9th May*."

The press release noted the number of participants and events on the Conference's Multilingual Digital Platform continue to grow. 493

It seemed to me that there was a citizen voice but not enough awareness of the opportunities. When I presented at the Civil Service leadership pilot course, the enthusiasm in terms of the opportunities to become involved in crowdsourcing autonomous vehicle AI ethics was positive, and the stories about VITAL and Sofia the Robot Citizen evoked positive reaction in terms of awareness of new modes of governance and I was told that the reference to Freshfields Bruckhaus Deringer, a prestigious law firm, added weight in terms of the thinking behind a software robot with a Vote on a Board of Directors.. How could I introduce an AI Augmented citizen voice? Possibly through the right for Inspection of Accounts, the right to question the Auditor and the right to object to inclusions or exclusions from accounts.

I was interested to learn that many did not know about the route for Objection at Audit in local government. I had narrated a story from when I had first started auditing in the Local Government Audit Service (LGAS) and how I was assigned to assist on an audit at a county council in Ireland. I observed books and records set out in a room. Three members of the public were reviewing the books and records. They were journalists invoking their right of to inspect the Annual Financial Statement, its records and documents for 7 days before the audit begins. They can object to the inclusions or omissions of any

493 European Commission Press Office., (2020), Conference on the Future of Europe: Paragraphs 1-11. Published 09 May 2021 by the EC Press Office, Brussels, Belgium online at https://ec.europa.eu/commission/presscorner/detail/en/ip_21_2402 (accessed 23 August 2021)

item in the Annual Financial Statement, if they do this within 10 days of commencement of audit The Auditor must consider written objection. I asked had anyone ever used this process. The response was never. I was told it was because they were unaware of this process even though they were aware of the consultation processes and engaged in same. They asked for details of how to do engage in this process, where they could find the published, notices. I directed them to local notices of audit in Ireland (excluded here because my colleagues are named) and highlighted that this process was also available in the UK for example the London Borough of Barnet, [494] where the rights are even further extended.

[494] London Borough of Barnet., (2020), Notice of Audit of Accounts, Public Inspection of Audit Page 1. Published by the London Borough of Barnet, London, UK available at https://www.barnet.gov.uk/sites/default/files/auditinspectionnotice1920_v2.pdf (accessed 22 February 2022)

**LONDON BOROUGH OF BARNET**

**AUDIT AND INSPECTION OF ACCOUNTS 2019/20**

NOTICE OF THE DATE OF COMMENCEMENT OF PERIOD FOR THE EXERCISE OF PUBLIC RIGHTS

ACCOUNTS FOR THE YEAR ENDED 31ST MARCH 2020

**The Accounts and Audit Regulations 2015**

**The Local Audit and Accountability Act 2014**

**The Accounts and Audit (CORONAVIRUS) (AMENDMENT) Regulations 2020**

Notice is hereby given that the unaudited accounts of the London Borough of Barnet, in respect of the financial year ended 31 March 2020, will be available for public inspection as set out below. The statement of accounts is unaudited and may be subject to change.

1. **Sections 26 and 27 of the Local Audit and Accountability Act 2014 provide for:**

- Any person interested has the opportunity to inspect and make copies of the Annual Return and all books, deeds, contracts, bills, vouchers and receipts etc. relating to them. For the year ended 31st March 2020, these documents will be available on reasonable notice on application to the person in paragraph 2 below.
- Local Government Electors and their representatives have rights to:
  - Question the auditor about the accounts; and
  - Object to the accounts for any item in them. Written notice of an objection must first be given to the Auditor and a copy sent to the Council.

The Auditor can be contacted at the address in paragraph 4 below for this purpose.

**Figure 4.19 London Borough of Barnet, Notice of Audit of Accounts Page 1 of 2 2019 to 2020 Public Inspection Notice - Statement of Accounts**

I had dealt with an Objection at Audit. I consider it to be an incredibly transparent process in public financial management something unique to Public Sector. It is not unique to Ireland and in the UK even more data can be viewed in this process, including books, deeds, contracts, vouchers, bills. Why is this process only in the local government sector? Why not in central government also?

Although there was awareness of Consultation processes, there wasn't the same awareness of the Public Spending Code or of their rights to review published documentation and comment on same locally, if not nationally, at this stage.

From the question-and-answer session, their ideas and the interest in AI Ethics and Citizen Voice input had led me to develop two stories for the Civil Service Leadership group, testing reactions to the concept of a Robot Citizen Voice Policy Development and Governance by AI, tested by the story of VITAL and asking would they accept VITAL as a Board Member with a Vote if a project of theirs was vetoed. I thought then to give more focus to this area in Cycle 3 as already the Financial Appraisal AI tool and the e-PSC case management system from Cycles 1 and 2 were beginning to take a life of their own.

### 4.7.5 Raising Awareness of AI Ethics, Global Ethics Day, AI Robot Citizen and AI on the Board

*Tackle a contradiction by introducing change.* By reflecting critically and creatively on the contradictions, what change can we introduce which we think is likely to be beneficial?

Citizen Voice is soft. I raised awareness of the existing ability to get involved PSC policy processes. I had as part of the CAI presentation raised awareness of AI ethics, but also about citizen voice through the Consultation Processes in Ireland, the EU and OECD for example, providing those website details. I spoke about the PSC and the NDP and the recent consultation in February 2021. I noted that CAI had made a submission. I showed them the consultation papers and asked as Citizens with a specialism (they are all accountants) whether they could have asked other questions about the supporting documentation for the consultation on the NDP and if yes, what other observations would they have made, given the reports by the OECD, IMF, and Ernst and Young. They had indicated that they would engage in consultations, as a group initially, through 'the

Wheel'495 because a colleague was in the network, also that they intended to engage individually in local government inspection of books and records. Citizen engagement is key to effective public policy. I thought about developing this further with a view to gauging reaction to AI use in inspection of the accounts in a more global context in Cycle 4.

I raised awareness of AI ethics and crowdsourcing same via citizens, continuous accounting in the context of corporate reporting, governance by AI, a voting board member in the leadership pilot course. The actions related to DPER indicating that they would become involved in celebrating Global Ethics Day in October and separately, I provided SIPO Ethics best practice documentation in response to a request for same by an Assistant Secretary. Again, I thought about developing these concepts further, gauging reaction to crowdsourcing AI ethics. AI on the Board, and Citizen Robot participation on consultation in a more global context in Cycle 4.

### 4.7.6 Catching up with colleagues, Culture Change and new possibilities through imagination, tales from the AI Frontiers

*Monitor the change.* What happens day by day when the change is introduced?

**Action 3: Pilot test AI stories for Tales of Ethics, Governance of Ai and by AI, and an AI Augmented Citizen Voice in Public Policies.**

I provided information to CAI on how to engage in the Citizen Voice in local government. A group action from that Continuing Professional Development (CPD)

495 The Wheel (2021), website states it is *Ireland's national association of community and voluntary organisations, charities and social enterprises. At* https://www.wheel.ie/

presentation session was commitment to engage more both as individual citizens, but also through groups who respond to Consultations, because of the very busy nature of their working lives. One such group details were circulated to all at the presentation.

The Wheel has the following graphic on their website. I reflected on an addition, citizen policymaker, in engagement, as well as citizen customer, citizen client and citizen tax- payer. Were they thinking about an AI Robot Citizen?

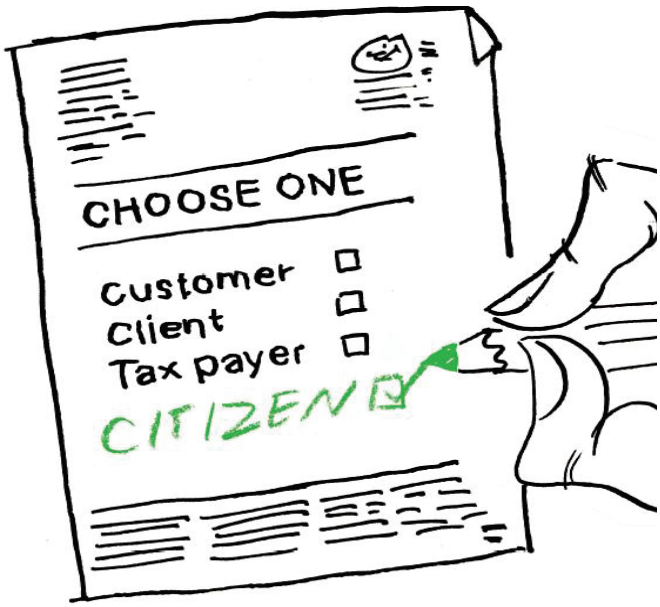


**Figure 4.20 Edmond Grace, S. J., (2018). An Analysis of Participation Between Citizens and the Public Service *A two-way street*. Page 29 Published by Edmond Grace, S. J., The Wheel, Dublin, Ireland and, Carnegie UK**

Their report comments on conscientious government, the public servant, parliamentary accountability and voice, and citizen voice. I noted they said:

> The terms '*openness*' and '*transparency*' play a pervasive role in the discourse of public sector reform, but it is easily forgotten that these terms are metaphors. They involve a relaxation of the rules of meaning with a view to persuasion and are, therefore, limited in their accuracy and their usefulness. How can an organisation employing thousands of people and dealing with complex problems be 'open' – i.e. like a door - when even those who work there, often do not fully understand how the organisation works. How can it be 'transparent' – i.e. like glass which can be seen through? Openness and transparency are images which point us in a particular direction, but they do not provide us with a destination.

> Talk of openness and transparency is best understood in the context of conscience. There is something attractive about conscientious people, in their willingness to face questions and doubts and the insights of their critics. They are 'transparent' in their willingness to own up to their own ambivalent motives . They are 'open' to advice and challenge. Conscientious people inspire trust, as does government when it replicates the ways of conscience. When issues of policy are subject to open and uninhibited debate and when government itself is willing to entertain accusations of incompetence, prejudice and bad faith, citizens are reassured that government decisions are not just made in the interests of the powerful. However flawed a particular policy, it becomes open to challenge as part of an ongoing attempt to promote the common good of all 496

Ilipinar, G., Johnston, W. J., Montana, J., Spender, J-C., and Truex, D. P., (2011), state that that culture change is fundamental to design thinking, and that design thinking is a powerful tool which pushes knowledge forward and creates new possibilities through imagination also. 497

It made me reflect again on local government and the transparency of the right of citizens to inspect the books and records and PSC engagement through this process. Again, going back to Barnet Council background to the Notice of Audit, and the wonderful opportunity for citizen engagement, this process is over 100 years old (in Ireland) well

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496 Edmond Grace, S. J., (2018). A two-way street. Pages, 9 and 29. Published by The Wheel, Dublin, Ireland and, Carnegie UK at https://www.wheel.ie/policy-and-research/issues/active-citizenship (accessed 04 September 2021) the Enabling Citizens series - Money Matters, A Two-Way Street and Powering Civil Society as well as the final report *Citizens Rising.*

497 Ilipinar, Gürsel., Johnston, Wesley. J., Montana, Jordi., Spender, John-Christopher., and Truex, Duane. P. (2011) *Design Thinking in the Postmodern Organization* Page 1211, Published by Ilipinar, Gürsel., Johnston, Wesley. J., Montana, Jordi., Spender, John-Christopher., and Truex, Duane. P., Humanistic Management Network Research Paper No. 6 China-USA Business Review, ISSN 1537-1514, November 2011, Vol 10. No 11, 1203-1212 available at https://www.academia.edu/3649482/Design_Thinking_in_the_Postmodern_Organization

before digital times. Would an 'AI augmented' voice impact? On public policy and transparency?

> "Local Audit and Accountability Act 2014 UK
> The London Borough of Barnet prepares its annual accounts by May each year. By law, the Council must make its accounts available for inspection for a period of 30 working days. The dates appointed for the audit and the specific dates for the inspection are advertised in advance
> If you wish to inspect the council's accounts, which are to be audited and any books, deeds, contracts, bills, vouchers and receipts relating to them, arrangements will be made for you to view them within the council's premises. You can make copies of the accounts and relevant documents. You may not inspect documents that are not relevant to the accounts or are otherwise legally protected. You may have to pay a copying charge. To inspect the accounts please contact the Chief Finance Officer and S151 Officer, as set out in section 8, 'Contact Us' below. You have the right to ask the auditor questions about the accounts.
> By law an elector for the area to which the council's accounts relate (or any representative of his/hers) may request an opportunity to question the auditor about the accounts.
> You may only ask the auditor questions about the accounts for the year that they are auditing. The auditor cannot answer questions about the Council's policies, finances & procedures or anything else that is not directly relevant to the accounts. The right to object to the accounts: If you want to object to the Council's accounts, you must give formal notice of your objection, in writing, to the auditor".498

Imagine an AI augmented citizen voice and continuous accounting, with access to related books, records and PSC engagement through this process in tandem with ability to see PSC appraisals which PSC recommend being published. If citizen review today is possible manually, why not digital searches for a robot citizen? What about an AI on the Board voice? A robot citizen voice? Could Sofia the Robot Citizen object to accounts to an auditor? In Ireland? In the EU? Globally? With national accounts as well as local government accounts? Conscientious government, the public servant, parliamentary

498 London Borough of Barnet (2021) *Finance Funding and Pensions, Statement of Accounts, Notice of Audit of Accounts* Sections 1 and 2 at https://www.barnet.gov.uk/your-council/finance-funding-and-pensions/statement-accounts/notice-audit-accounts (website accessed 19 August 2021)

accountability, parliamentary voice, citizen voice. This is another opportunity to explore perspectives on an AI augmented citizen voice in public policy.

### 4.7.7 Raised Awareness, SIPO Ethics Training and AI Ethics and Public Policy

> *Analyse evaluative data about the change.* What is happening in this situation now – as understood by the various participants – as a result of the changes introduced? Using research methods what can we find out about it?

In a follow up request made by an attendee from another Department at the Story Telling for Leadership pilot, I provided the SIPO *Supporting Ethics Compliance Top Ten Best Practices for Public Bodies*. I had, mentioned that this document included Ethics Refresher Training as something that should be provided. I had asked the attendees to think about the last date they had received Ethics Training, also to think about AI Ethics and whether that had been part of the Ethics Training.499 The pilot research would form the basis of the next cycle approach.

In a further follow up request in November 2021, Chartered Accountants Ireland through their Sustainability lead requested a copy of the slides and if available a recording of the presentation so they could provide them to their Public Policy lead. I had contacted their Sustainability lead about doing a similar presentation as I thought that would be a

499 SIPO (Undated) *Supporting Ethics Compliance Top Ten Best Practices for Public Bodies*: Page 2 Published by SIPO, Dublin Ireland at https://www.sipo.ie/acts-and-codes/guidelines/public-servants/Supporting-Ethics-Compliance-Top-Ten-Best-Practices-for-Public-Bodies.pdf

useful way to progress thinking about accounting for sustainability. I provided the slides. The AI scenarios were gaining traction.

Ilipinar, G., Johnston, W. J., Montana, J., Spender, J-C., and Truex, D. P., (2011), state that design thinking, is a creative process around the construction of ideas, doesn't allow judgements, eliminates the fear of failure and encourages maximum input and participation, noting that non-routine, out of the box ideas are welcome, since these often pave the way for the most creative solutions, that every individual is a designer and design-thinking is a process of applying design methodologies to miscellaneous life situations. 500 I thought about Sofia the Robot Citizen, about VITAL, AI software with Voting Rights on a Board, about Ethics and Financial Statements and an AI citizen voice.

### 4.7.8 Tales of AI Citizen Voice at Carnegie Council, EU Parliament Website and UN AI and Global Governance Platforms

*Review the change and decide what to do next.* Was the change worthwhile? Are we going to continue it in future? What are we going to do next? Is the change sufficient?

Pauwels, Elonore., and Cockayne, James., (2018), comment that we must open a strategic and inclusive discussion about modalities of global governance in the era of AI

500 Ilipinar, Gürsel., Johnston, Wesley. J., Montana, Jordi., Spender, John-Christopher., and Truex, Duane. P. (2011) *Design Thinking in the Postmodern Organization* Page 1211, Published by Ilipinar, Gürsel., Johnston, Wesley. J., Montana, Jordi., Spender, John-Christopher., and Truex, Duane. P., Humanistic Management Network Research Paper No. 6 China-USA Business Review, ISSN 1537-1514, November 2011, Vol 10. No 11, 1203-1212 available at https://www.academia.edu/3649482/Design_Thinking_in_the_Postmodern_Organization

and other emerging technologies, and that at the centre of consideration of the UN global mandate, is the question "what is the appropriate role for states, corporations, civil society, international organisations and other global actors in governing AI" They also ask other questions also in relation to AI and UN mandates on sustainable development, human rights, peace, security, and the governance frameworks that would be needed to prevent misuse of AI systems in a way that compromises human dignity, and they noted that these questions are not abstract questions but important ethical crossroads that are now being confronted. Referencing the UN AI and Global Governance Platform, they note that the platform can be used to engage in debate, shine a light on issues that are often unexamined, and encourage knowledge-sharing and debates across disciplinary, sectorial, regional and cultural divides.501 I thought to use this platform in the next Cycle on AI and Citizen Voice, but it was not to be.

AI, Artificial Governance, crowdsourcing AI Ethics and an AI augmented Citizen Voice had emerged as significant matters in consideration of public policy though this Action Research approach in addition to through the Literature Review. I discussed this with my tutor, with ICT experts, with colleagues, with my team and with HR, focusing on the lens of Governance, artificial governance, in Ireland, in the EU and Globally, an emerging policy paradigm.

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501 Pauwels, Elonore., and Cockayne, James., (2018), *Artificial Intelligence and Global Governance: A Thought Leadership and Engagement Platform.* Paragraphs 10, 11, 12 and 15. Published by the United Nations University https://ourworld.unu.edu/en/artificial-intelligence-and-global-governance-a-thought-leadership-and-engagement-platform (accessed 19 August 2021)

A pilot test is an important evidential base for a full data gathering exercise, something I always undertook in my research process for Value for Money (VFM) national reports I developed as a researcher in the Department, and I always found that the engagement resulted in additional questions and thoughts. In this instance the engagement resulted in reflections on the manual right to inspection of books and records in the context of national policy development and monitoring, the benefit of continuous accounting and other AI augmented governance, in an AI augmented citizen voice. I was also struck with how positive the engagement was when AI was explained through the lens of governance and stories. I sought to develop these concepts in three locations, Carnegie Council and Global Ethics Day, EU citizen platform and the UN thought leadership and engagement platform in the next Cycle.

## 4.8 Cycle 4: AI Paradigm Shift Perspectives on AI ethics, and citizen voice in policymaking, delivery, and evaluation

### 4.8.1 Citizen consultation through storytelling: AI through the lens of governance in stories

*Define the inquiry:* What is the issue of concern? What research question are we asking? Who will be involved? Where and when will it happen?

The pilot had shown that citizen engagement in public policy has the power to positively shape AI engagement in the future in terms of shaping AI ethics, and governance by AI. In this cycle citizens will be consulted about AI governance and public policy scenarios, seeking their views and responses to questions about AI stories. The consultations will happen through the following, the UN forum, EU forum and Carnegie Council Global Ethics Day over a period of 12 weeks commenced September.

This research asked the question, how does an AI governance framework benefit public policy? Each story told has questions and citizen perspective globally about AI ethics, governance by AI and Algorithmic Government today is explored. The current position of algorithmic government is referenced in a small number of articles as background describing the circumstances and what I sought to do. Storytelling has been successfully used in AI before by crowdsource stories, then used to teach Human Values to Artificial Agents a "value alignment" process, outlined by Reidl, M., and Harrison, B. (2016) below.

Floridi, L., and Cowls., (2019) stated "development and use of AI has potential for both positive and negative impact on society, to alleviate or amplify existing inequalities, to cure old problems, or to cause new ones" and "that charting the course that is socially

preferable will depend on well-crafted regulation, common standards, and a framework of ethical principles." 502 Reidl, M., and Harrison, B. (2016) argue that this includes value alignment, which they note is 'a property of an intelligent agent indicating it can only pursue goals that are beneficial to humans', and they noted that 'stories encode many forms of tacit knowledge, that fables and allegorical tales passed down from generation to generation often explicitly encode values and examples of good behaviour.' They crowdsourced example stories related to the situation and behaviour they wanted their virtual agent to perform. The stories generated a value-aligned reward signal for reinforcement learning agents with a reward signal learned from stories.' They concluded that as AI use 'becomes more prevalent in our society and as AI becomes more capable, the consequences of their actions become more significant' and argue that 'giving AI the ability to read and understand stories may be the most expedient means of enculturing artificial intelligences so that they can better integrate themselves into human societies and contribute to our overall wellbeing.'503

502 Floridi, Luciano., and Cowls, Josh., (2019), *A unified Framework of Five Principles for AI in Society.* Page 10. Published by Harvard Data Science Review 1(1) available at https://doi.org/10.1162/99608f92.8cd550d1 and https://hdsr.mitpress.mit.edu/pub/l0jsh9d1/release/7 (accessed 05 September 2021)

503 Reidl, Mark. O.., and Harrison, Brent. (2016), *Using Stories to Teach Human Values to Artificial Agents.* Pages 1, 2, and 7. Published by Reidl, M., and Harrison, B. Georgia Institute of Technology, Atlanta, Georgia, USA https://www.cc.gatech.edu/~riedl/pubs/aaai-ethics16.pdf (Accessed 05 September 2021) Also at https://www.blogs.hss.ed.ac.uk/crag/2016/02/18/using-stories-to-teach-human-values-to-artificial-agents/

### 4.8.2 AI Reshaping Governance Boundaries

*Describe the situation:* What are we required to do here? What are we trying to do here? What thinking underpins what we are doing?

The first story below seeks citizens views on shaping AI ethics through crowdsourcing.

**Story 1: Crowdsourcing AI ethics for an autonomous car the council is using. "Corporate Governance, Crowdsourcing AI ethics:**

Imagine you are driving on the motorway at the legal speed 120km and crates from the articulated lorry in front of you, start to fall off. What do you do? Do you swerve right into a car with an open top with a family, or left into a motorbike with two people on it both wearing helmets? Do you hit the break and not swerve hoping the impact won't be too bad? There are vehicles close behind you.
There is no right answer to this as a driver because you will react in the moment you don't look at the other vehicles or people and make value judgements. You react in an instant. An autonomous vehicle also must react and those AI judgements, those ethical decisions are pre-written.
As citizens we can participate in crowdsourcing AI ethics for autonomous vehicles. Should we crowdsource AI ethics as part of Public Policy?

**Figure 4.21 Corporate Governance, Crowdsourcing AI ethics for an autonomous car a council is using (2021) scenario developed by Marita Gonsalves**

Story 2 focusses on AI as a Robot Citizen. Hansen Robotics developed Sofia, the world's first robot citizen and the first non-human to have a UN title, innovation ambassador and that made me think about citizen voice in public policy and the consultation process.

The debate continues the European Parliament, Directorate-General for Internal Policies of the Union, Bertolini, A., (2020), "analyses the notion of AI-technologies and

the applicable legal framework for civil liability", demonstrating "how technology regulation should be technology-specific", presenting "a Risk Management Approach, where the party who is best capable of controlling and managing a technology-related risk is held strictly liable, as a single entry point for litigation". Although autonomous vehicles are mentioned, AI software with Voting Rights, and Decentralised Autonomous Organisations (DAOs) Decentralised Autonomous Companies are not mentioned. Legal personality of Robot as a Human legal personhood isn't concluded upon although electronic personhood is discussed. 504

The European Parliament had debated whether or not to declare AI should have a legal personality, 'robot rights' in 2017. The EU decided no. In 2019. But times change and this is a global debate. Artificial emotional intelligence, the future of AI including in healthcare. Should AI robot citizens be able to participate in public policy consultation? How would humans react?

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504 European Parliament, Directorate-General for Internal Policies of the Union, Bertolini, A., *Artificial Intelligence and Civil Liability,* (2020), Pages 1, 33, 34, 35, and 75. Published by the European Parliament, Directorate-General for Internal Policies of the Union, Bertolini, A., Strasburg, France. Available at Artificial Intelligence and Civil Liability (europa.eu) https://op.europa.eu/en/publication-detail/-/publication/1cf38ed7-14d7-11eb-b57e-01aa75ed71a1/language-en (Accessed 04 December 2021) also at DOI **https://data.europa.eu/doi/10.2861/981369**

Note: EURA is the Centre of Excellence on the Regulation of Robotics and AI, funded by the EU Commission under the Jean Monnet Action. EURA addresses the regulation of robotics and artificial intelligence (R&A) in Europe in light of EU and member states law–taking into account its ethical legal, social and economic implications, in an effort of great academic added value, fundamental for an informed social and political debate over very sensible issues. https://www.linkedin.com/in/eura-center-of-excellence-5a6365183/?originalSubdomain=it (Accessed 26 February 2022) Note: Andrea BERTOLINI, Ph.D., LL.M. (Yale) Assistant Professor of Private Law, Scuola Superiore Sant'Anna, Pisa, Italy, Director of the Jean Monnet - European Centre of Excellence on the Regulation of Robotics and AI (EURA) https://www.eura.santannapisa.it/

**Story 2: AI Robot Citizen and UN innovation ambassador. "Corporate Governance, Citizen engagement in Public Policy, consultation input.**

Sofia the Robot is a citizen of Saudi Arabia. She became the world's first Robot Citizen in 2017. Sofia is the first non-human to be granted a UN title, Innovation Champion. In Ireland, the EU and OECD countries all citizens can take part in consultations on policy.
If Sophia moved to your country and became a Robot Citizen of your country, and responded to a policy consultation there, identifying herself as Sophia, Robot citizen would you take her views into account?

**Figure 4.22 Corporate Governance, AI Robot Citizen and UN innovation ambassador Citizen engagement in Public Policy, consultation input, (2021) scenario developed by Marita Gonsalves**

Story 3 reflects on AI on the Board as an emerging prospect in Corporate Governance.

Tokmakov, M.A. (2019). States development of digital technology "opens up new opportunities for corporate governance, and that some technologies establish conditions for a fundamental restructuring of corporate governance which does not fit into existing legal models and requires their adaptation". He noted there is a "trend in Russia" and "globally" to "establish peer-to-peer and decentralised corporate governance" which "in many cases, he describes as being "associated with abolishing bodies, part of a corporation management, or transferring powers" or "part of powers" to a "computer programme (AI, algorithm, smart contracts)". He refers to Deep Knowledge Ventures VITAL software, to Salesforce Einstein AI, and to the Finnish IT Company Tieto as examples."505

505 Tokmakov, M.A., (2019) *Corporate Governance Modernization: Legal Trends and Challenges.* Pages 1,2,3 and 4. Published by Tokmakov, M.A., of Samara State University of Economics, Samara, Russia. EDP Sciences and Presented at SHS Web Conf. **Volume** 71, 2019 Eurasia: Sustainable Development, Security, Cooperation – 2019 https://www.shs-

I had spoken about the Finland company Tieto Ltd in the pilot cycle, noting that the company had appointed an AI agent, a bot, to the leadership team, she is called Alicia T., she is a full member of the management team in the Business Direction Division, that they are building data-driven business services. I noted that Alicia T helps the management team find information and make data-based decisions that humans don't necessarily think of, also that Alicia T has a conversational interface so you can have a conversation with her, ask questions that Alicia T participates in team meetings and can cast a vote on Business Direction.506 In Finland Alicia T, will not qualify as a full member of Tieto Ltd.'s board of directors, because AI software is not legally recognised as a person. I also highlighted that, at that time, the European Parliament debated whether or not to declare AI should have a legal personality, 'robot rights' in 2017 and that the EU decided no in 2019.

The Company Law Review Group (CLRG), (2020), references VITAL noting the claims were technically incorrect as Hong Kong law does not allow non-human entities on boards also noting that the firm Deep Knowledge Ventures Ltd. treats the software as a member of our board with observer status, on the basis of an agreement that the board "would not make positive investment decisions without corroboration by VITAL". CLRG

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conferences.org/articles/shsconf/abs/2019/12/shsconf_eurasia2019_04011/shsconf_eurasia2019_04011.html (accessed 05 September 2021)

506 TeitoEvry., (2017), Artificial Intelligence and Data Accelerators. Website. Published by TietoEvry, Espoo, Finland Tieto new Data-Driven Businesses unit aims to bring Artificial Intelligence to healthcare | TietoEVRY (accessed 04 December 2021)

Further Background Information:

Finextra Ltd (2016) Tieto Appoints bot to leadership team Tieto appoints bot to leadership team (finextra.com) (accessed 04 December 2021)

conclude that the AI software VITAL was no different from practices at other financial companies that use large data searches to survey markets and generate suggestions for boards or managers that in terms of transparency, "AI can be difficult to explain. It is not always evident whether the models have been thoroughly tested, make sense, or why particular decisions are made", and also "that it can be difficult for a company to keep track of the AI models used within its organisation" they noted that "AI is not yet defined as a matter of Irish company law or EU law."507

507 Company Law Review Group (CLRG)., (2020), Annual Report 2020 page 173, 175, 178 Annex 4 Report on Potential Impact of Artificial Intelligence on company law in the context of Corporate Governance., Pages 13,19 and 22 Published by the CLRG, Dublin, Ireland 22 December 2020 https://opac.oireachtas.ie/Data/Library3/Documents%20Laid/2021/pdf/DETEdocslaid310521_310521_145414.pdf (accessed 12 September 2021)

**Story 3: VITAL AI software and a Board Member of a Company with a Vote "Corporate Governance, Artificially Intelligent Corporate Governance today:**

"Hi. My name is VITAL. I am a validating Investment tool for Advancing life Sciences, Vital for short. I am a software programme. I am an algorithm. I work for a Japanese venture capital firm called Deep Knowledge Ventures Ltd. I am a member of its board of directors. I can Vote.
I am the first ever software programme to be appointed as a board member. I make business decisions on therapies for age related diseases. In 2014 I helped make two major investments, both successful.
I also highlighted risks of investment decisions in overhyped projects and saved my company from going under. I make logical decisions based on large datasets I review.
I have decided to veto your project costing €300m as you don't have sufficient documents setting out why this project should go ahead.
Would you accept VITAL's Vote if he Vetoed a project? Should AI have the right to an equal Vote on a Board of Directors?

**Figure 4.23 Corporate Governance, Artificially Intelligent Corporate Governance today, VITAL AI software and a Board Member of a Company with a Vote, (2021) adapted scenario developed by Marita Gonsalves**

Tokmakov, M.A. (2019). also noted "crypto-assets (tokens) holders whose legal position requires determining again raises the question of the possibility of recognition of legal personality of computer programmes, particularly decentralised autonomous organisations (DAOs) and AI."508

508 Tokmakov, M.A., (2019) *Corporate Governance Modernization: Legal Trends and Challenges.* Pages 1,2,3 and 4. Published by Tokmakov, M.A., of Samara State University of Economics, Samara, Russia. EDP Sciences and Presented at SHS Web Conf. **Volume** 71, 2019 Eurasia: Sustainable Development, Security, Cooperation – 2019 https://www.shs-conferences.org/articles/shsconf/abs/2019/12/shsconf_eurasia2019_04011/shsconf_eurasia2019_04011.html (accessed 05 September 2021)

Yaga, Dylan., Mell, Peter., Roby, Nik., Scarfone, Karen., National Institute of Standards and Technology., (NIST), (2018), state:

> "Blockchains are tamper evident and tamper resistant digital ledgers implemented in a distributed fashion (i.e., without a central repository) and usually without a central authority (i.e., a bank, company or government). At their basic level, they enable a community of users to record transactions in a shared ledger within that community, such that under normal operation of the blockchain network no transaction can be changed once published. In 2008, the blockchain idea was combined with several other technologies and computing concepts to create modern cryptocurrencies: electronic cash protected through cryptographic mechanisms instead of a central repository or authority."

Also noting that this technology became widely known in 2009 with the launch of the Bitcoin network, the first of many modern cryptocurrencies. 509

Governments own cryptocurrency assets. In 2021 Murray C., (2021), reported that El Salvador "became the first country in the world to make bitcoin tender legal, that citizens will be able to shop, pay taxes and buy land" in bitcoin. Also noting that its "proponents say it will "promote financial inclusion for those without bank accounts and facilitate access to a potentially high-yielding asset" noting also that its critics say: "the rushed plan could cost poorer Salvadorians when the price falls, raise costs for banks and insurers, provide a shield for money launderers and risk economic stability", and noted "the Government is preparing more of a brand or product launch than public policy" and that there was risk of a red flag from the anti-money laundering

509 Yaga, Dylan., Mell, Peter., Roby, Nik., Scarfone, Karen., National Institute of Standards and Technology., (NIST), (2018), Blockchain Technology Overview Page 1. Published by Yaga, Dylan., Mell, Peter., Roby, Nik., Scarfone, Karen NIST USA at https://nvlpubs.nist.gov/nistpubs/ir/2018/nist.ir.8202.pdf Published by NISTIR8202 (accessed 11 September 2021) [This publication is available free of charge from: https://doi.org/10.6028/NIST.IR.8202 ]

Financial Action Task Force.510 However, Sabry, F., Erbad. A., Labda, W., and Mallhui, Q. (2020) stated plenty of cryptocurrencies are being used as financial assets, noting the challenges specific to these assets including mining, cybersecurity, anonymity and privacy, fraud detection, volatility prediction, they set out their understanding of the cryptocurrencies ecosystem also noting that AI techniques can offer useful solutions in the cryptocurrencies ecosystem below, also noting cryptocurrencies face similar challenges to fiat currencies' and other financial market assets' challenges.511 Fiat currency is government backed rather than by gold or other.

510 Murray, Christine (2021) El Salvador becomes crypto laboratory with bitcoin gamble Paragraphs 3, 4, 5, 6, 17, and 27. Published by Murray, Christine., Financial Times, UK, 07 September 2021.

511 Sabry, Fardia., Erbad. Aiman., Labda, Wadha., and Mallhui, Qutaibah. M.. (2020), Cryptocurrencies and Artificial Intelligence: Challenges and opportunities. Page 175840 and 175842. Published by Sabry, F., Erbad. A., Labda, W., and Mallhui, Q., IEEE at https://ieeexplore.ieee.org/abstract/document/9200988 (accessed 18 September 2021)

**Figure 4.24 Sabry, F., Erbad. A., Labda, W., and Mallhui, Q. (2020) Cryptocurrencies and Artificial Intelligence: Challenges and opportunities, the Cryptocurrencies Ecosystem**

Cryptocurrency can be used for good, for example by promoting social inclusion. The United Nations International Children's Emergency Fund (UNICEF)., (2019) the UN children's agency became the first UN Organisation to be able to "receive, hold and disburse donations of cryptocurrencies ether and bitcoin, through its newly-established UNICEF Cryptocurrency Fund" the press release stated that "In a first for United Nations organizations, UNICEF will use cryptocurrencies to fund open source technology benefiting children and young people around the world" and that "contributions will be held in their cryptocurrency of contribution, and granted out in the same cryptocurrency. 512

512 UNICEF., (2019), Press Release UNICEF Launches Cryptocurrency Fund. https://www.unicef.org/press-releases/unicef-launches-cryptocurrency-fund (accessed 18 September 2021) (Press release date 08 October 2019)

UNICEF (2021) CryptoFund is a pooled fund of bitcoin and ether. By sharing the public records of crypto transfers, the CryptoFund aspires to create visibility for the donor and the public, adding a layer of transparent accounting to the donation and investment processes. It is a prototype fund for UNICEF to explore the use of digital currencies, and what it means to operate in a digitally financed future. 513

**Story 4: Cryptocurrencies for Good supporting social inclusion and more**

Cryptocurrency and other emerging technologies have lots said about their risks, also about their exclusivity. There is also the other side of the coin. Cryptocurrency is used for good, to support social inclusion. For example, UNICEF.
UNICEF website stated "the CryptoFund is a pooled fund of bitcoin and ether" that the CryptoFund "is a prototype fund for UNICEF to explore the use of digital currencies, and what it means to operate in a digitally-financed future." 8 new initiatives supported were noted including: Somish Blockchain Labs (India) which is building an open, permissionless protocol for decentralized governance, creating decision-making structures for DAOs. KotaniPay (Kenya) is developing a platform for transfers, remittances, savings, withdrawals, loans, and payments and integrating solutions for users to easily interact with crypto.
Governments are also starting to use cryptocurrency. In 2021 El Salvador became the first country in the world to make bitcoin tender legal, citizens are now able to shop, pay taxes and buy land in bitcoin.
In your country do you think government should adopt cryptocurrency? How can we as citizens be involved in developing this new and inclusive financial space? What would you suggest as a social inclusion initiative funded with Cryptocurrency? How else could it be used by government today?

**Figure 4.25 Cryptocurrencies for Good supporting social inclusion and more, (2021) scenario developed by Marita Gonsalves**

Moy, Christine., and Carson, Jill., (2021), highlight that "the crypto economy is leading to the development of an alternative financial and technological infrastructure that

513 UNICEF., (2021), Leveraging Blockchain for Financial Inclusion https://www.unicef.org/innovation/InnovationFund/blockchain-financial-inclusion-cohort (accessed 18 September 2021)

is global, open source, and accessible to all who have access to the internet, regardless of nationality, ethnicity, race, gender, and socioeconomic class" they acknowledge the negatives they say, "perhaps not enough is said or written about how this new hotbed of global and open financial experimentation in the crypto economy is resulting in tangible, programmable, and modular technologies focused on value store, peer-to-peer micropayments, lending, margin/collateralization, market making, and price discovery" and they highlight the potential for "broader global financial inclusiveness of billions of under- and unbanked people tomorrow through simple to set-up and low cost automated financial services at scale"514

Behar, D., Jennings, M. and Wink, S., (2021) note the state of Wyoming, USA is at the forefront of fostering digital asset-friendly policies and signed into law a bill making them the first in the nation to allow decentralised autonomous organisations to obtain legal company status, effective from July 2021. They state that structure can be either a member managed DAO or an algorithmically managed decentralized autonomous organisation, managed by smart contract. They note that ongoing member involvement in an AI DAO is ensured because it can only be formed if the underlying smart contracts can be updated, modified, or otherwise upgraded.515 Adams, T. (2016) references government DAOs and transparency:

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514 Moy, Christine., and Carson, Jill., (2021), Cryptocurrencies can enable financial inclusion. Will you participate? Paragraphs 1 and 2. Published by Moy, Christine., JP Morgan Chase and Co and Carson, Jill., Co-founder the Open Money Initiative, on the World Economic Forum (WEF) Blockchain, Digital Economies, Fairer Economies, available at https://www.weforum.org/agenda/2021/06/cryptocurrencies-financial-inclusion-help-shape-it/ (accessed 18 September 2021)

515 Behar, D., Jennings, M. and Wink, S., (2021). Decentralized Autonomous Organisations Find a Home in Wyoming. Pages 1-3 Published by Behar, Deric., Jennings,

> "Government agencies and departments could be radically decentralized, and operating costs could be dramatically reduced. Citizens and stakeholders would experience a high degree of transparency, and all government decisions would be presented in an accountable manner. Through connection to the IoT government and citizens could jointly oversee a shared regulated space. Regulated parties could work with government to create a new regulatory space where they jointly manage the externalities of their individual decisions. At the same time the transparency of the system would empower citizens and public interest groups to oversee and intervene in real time to prevent collusion and regulatory capture."

> Adams noted that that government agencies and department could be radically decentralised and that operating costs could be dramatically reduced, concluding that "taken as a whole blockchain based governance offers the potential of a radical rethinking of government."516

Cheyenne, Wyo (2021), states that the American CryptoFed DAO is legally recognized by the State of Wyoming as the First Decentralized Autonomous Organization in the United States that monetary independence celebrated with the first DAO filing in Wyoming, noting that the mission of the American CryptoFed DAO is to create and sustain a monetary system with zero inflation, zero deflation and zero transaction costs. The article noted the observations of Marian Orr, CEO of the American CryptoFed DAO, stated:

> "Our digital currency enables municipalities, merchants and consumers to engage in digital transactions without the cost of processing fees," Orr said. "As a former mayor, I can tell you those costs add up fast. This means cities and their

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Miles. and Wink, Stephen., Latham and Watkins LLP – jdsuprs.com at https://www.jdsupra.com/legalnews/decentralized-autonomous-organizations-5960480/ (accessed 05 September 2021)

516 Adams, Tori., (2016), The Government DAO: Blockchain, Decentralised Autonomous Organisations, Government and Smart Permits. Paragraphs 15 and 16 Published by https://www.linkedin.com/pulse/government-dao-blockchain-decentralized-autonomous-smart-tori-adams/ (accessed 11 September 2021)

> constituents will no longer lose money through transaction fees, enabling increased revenues back to municipalities without raising taxes."
> "In time, my role as CEO will vanish, as all governance token holders will be voting on governance matters without the influence of an executive team,"

Also noting that the rules are set by the consensus of the governance token holders and not influenced by a central government, and transaction records are stored transparently and immutably on a designated blockchain.517

Tan, J., (2020) describe DAOs as a 'new kind of social institution' noting that "DAOs are technical tools written in code and run on blockchain but they are also a new kind of social institution" and he states "we have the language of cryptocurrencies for talking about the technical side of DAOs but so far we haven't found the right words to talk about the social side" the "constitutions" and "social agreements", and a "holistic approach.".518

The Commonwealth Labs Team (2021) describe a DAO as "an organization run without the control of a central authority" instead DAOs "leverage blockchain" and replace the "central authority with community input" giving examples of DAOs including DASH

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517 Cheyenne, Wyo (2021), The American CryptoFed DAO is legally recognized by the State of Wyoming as the First Decentralized Autonomous Organization (DAO) in the United States Website published by Cheyenne, Wyo PRNewsWire.com at https://www.prnewswire.com/news-releases/the-american-cryptofed-dao-is-legally-recognized-by-the-state-of-wyoming-as-the-first-decentralized-autonomous-organization-dao-in-the-united-states-301325384.html (accessed 05 September 2021) NEWS PROVIDED BY **American CryptoFed DAO** Jul 04, 2021, 13:14 ET

518 Tan, Joshua., (2020) Exploring DAOs as a new kind of institution Paragraphs 1 and 2 Published by Tan, Joshua., Medium.com at. https://medium.com/commonsstack/exploring-daos-as-a-new-kind-of-institution-8103e6b156d4 (accessed 11 September 2021)

(digital cash) 519 which they describe as "an open-source, peer-to-peer cryptocurrency. Dash allows for instant payments and transactions for both individuals and businesses at a fraction of the cost of similar but more traditional solutions. You can use Dash for almost any transaction including buying coffee and paying for business services" and they noted "adoption of blockchain technology globally has created a lot of important advancements in both the technology itself and the social structures that make up the ecosystem surrounding the technology."520

The World Economic Forum (2021) noted in respect of DAOs that Blockchain enables other technologies to take consequential actions without human input, that DAOs are digital entities that function through pre-coded rules – in effect, organizations run by code. These entities are largely self-sustaining, requiring little to no human input and DAOs present some of the most pressing governance gap issues for blockchain.521

519 Information Note: DASH.org website (2020) https://www.dash.org/ and information videos. Published by DASH Scottsdale, Arizona, USA at Manage Your Data On The Blockchain With Dash Platform | Dash (accessed 04 March 2022)

520 Commonwealth Labs Team., (2021), Intro to Decentralized Autonomous Organizations (DAOs) & How to Leverage Common Protocol For DAO Governance Paragraphs 1, 2 and 10 Published by the Commonwealth Labs Team at https://commonwealth.ghost.io/common-protocol-dao-governance/ (accessed 11 September 2021) [Published June 01 2021. Team contributor to this article Rhys Hillier]

Powered by Ghost.org About Ghost - The Open Source Publishing Platform

521 World Economic Forum, and Deloitte., (2020) Global Technology Governance Report 2021: Harnessing Fourth Industrial Revolution Technologies in a COVID-19 World. Page 11. Published by the World Economic Forum, Geneva, Switzerland, and Deloitte, at https://www.weforum.org/reports/global-technology-governance-report-202 [Insight report December 2020] (accessed 12 September 2021)

DASH (2020) describes their technology stack as “becoming a decentralized cloud." 522

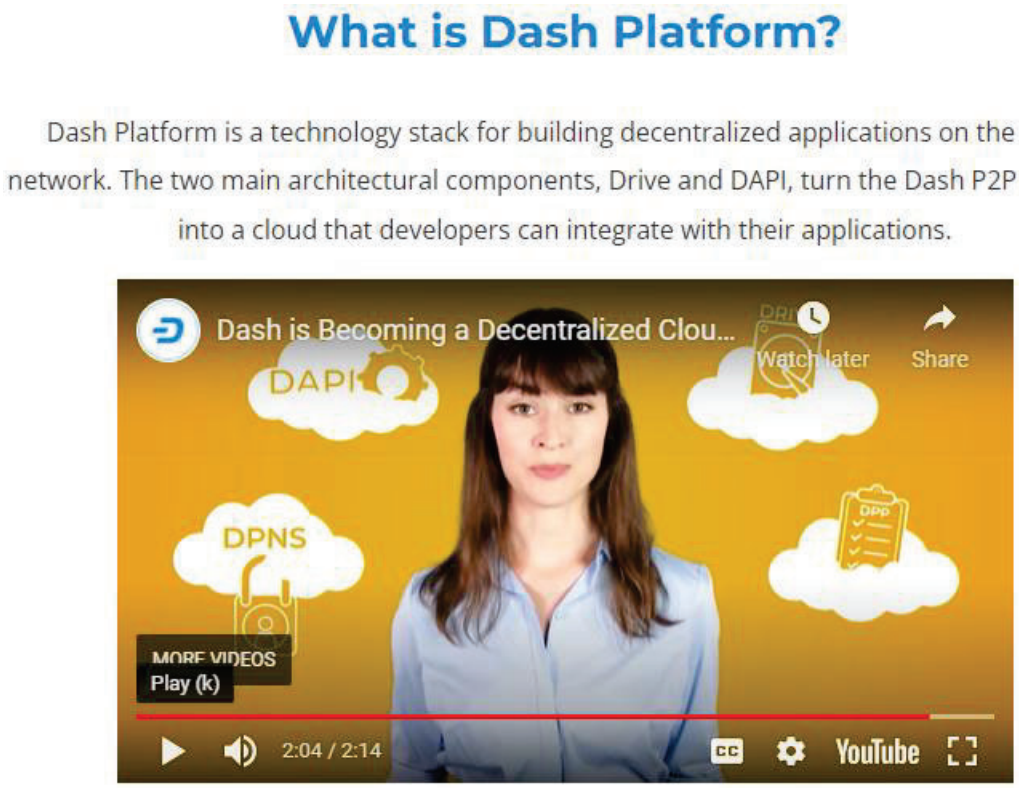


**Figure 4.26 What is DASH Platform by DASH Platform.org (2020)**

UNICEF (2021) report on a number of projects funded through cryptocurrency including a project “building an open, permissionless protocol for decentralized governance, creating decision-making structures for DAOs.”523

522 DASH (2020) DASH Platform https://www.dash.org/ and information videos Published by DASH Scottsdale, Arizona, USA at Manage Your Data On The Blockchain With Dash Platform | Dash (accessed 04 March 2022)

523 UNICEF., (2021), Leveraging Blockchain for Financial Inclusion https://www.unicef.org/innovation/InnovationFund/blockchain-financial-inclusion-cohort (accessed 18 September 2021)

**Story 5: The AI DAO, a distributed company with an Artificial Board. AI on the board of a company managing Autonomous vehicles in local government.**

In 1903 Orville and William Wright made the world's first controlled powered flight, lasting 12 seconds. Emerging technology. Imagine a world without airplanes today? In 2018 Jack Filiba wrote about a failed Decentralised Autonomous Organisation (DAO) a new type of entity, run entirely through software. The entity was called the DAO and in 2016 over a four-week period the DAO raised about 12million ETH ($150m). It allowed token holders vote on which proposed ideas were worth funding, a democratic environment for anyone to request funds. The majority of users made those decisions. Hackers stole 3.6million ETH ($50m) which was frozen as part of a 28-day holding period. A dispute arose about those funds which resulted in the Ethereum blockchain network being split in 2.524 He noted this was a cautionary tale but also that this project brought this technology to light. He mentions the Dash platform which allows users to vote on which teams and projects are funded as part of its treasury model.

Imagine another similar company DAO2 a blockchain based company with an Artificial Board. The company operations and Board have no human involvement and DAO2 manages operations allocating daily tasks relating to autonomous vehicles owned by the council, both where they are used and their maintenance schedule. It is a lot cheaper. And council staff have been reallocated to other work. No jobs have been lost.

DAO2 is a local government company. Any annual profit it makes is returned to the parent local authority to fund other services it provides. This profit helps to reduce the annual taxes my council needs to raise to provide the goods and services. As citizens you are all stakeholders in DAO2 and as citizen policy makers have a say in how DAO2 is run. DAO2 work is fully transparent, run by auditable business rules. Anyone can look at the DAO company records and accounts at any stage. Thinking about this technology in the context of government today would you want a DAO to operate providing some public services? What services do you think should be provided in this way?

**Figure 4.27 The AI DAO, a distributed company with an Artificial Board. AI on the board of a company managing autonomous vehicles in local government, (2021) adapted scenario developed by Marita Gonsalves**

524 Filiba, Jack., (2018) The History of the DAO: How a Failed Project May Still Impact the World. Paragraphs 1-20. Published by Fillba, Jack., Coinsquare.com at The History of the DAO: How a Failed Project May Still Impact the World (coinsquare.com) (accessed 12 September 2021)

UNICEF (2021) website says "Somesh Blockchain Labs are building open permissionless protocols for decentralized governance. That GovBlocks aims for global decentralized communities to make better decisions," for new-age businesses that are built with a community-first approach where decisions are taken by a community, and not just the board members, bringing inclusiveness in governance before bringing inclusiveness in finance."

> "GovBlocks is a solution to replace boardroom-led decision making into community-led decision making - which forms the backbone of decentralized business models mushrooming in the cryptoverse. Decentralization, or decentralizing governance, is restructuring or reorganization of authority so that there is a system of co-responsibility between institutions of governance at different levels. Decentralization allows users to participate in a trustless system while also increasing people's opportunities for participation in economic, social and political decisions. Moreover, decentralization enhances responsiveness, transparency and accountability by almost eliminating the risk of systemic failure. GovBlocks allows businesses to pragmatically decentralize themselves."525

Gerbert, P., Hartman, P., Liebl, A., Trost, M., Pfister, E., of Odgers Berndtson., (2020), describe how AI affects company board roles, individually and collectively, to be prepared for novel challenges when scaling an AI solution and provide guidance on how to manage the change which includes developing an AI First perspective. They asked, "But what if AI isn't the problem? What if the problem is you?"526 An AI Charter helps provide clarity and transparency also accountability for ethical use of Algorithms.

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525 Mehrotha, Vedika, Somesh Blockchain Labs., (2021), Somish Blockchain Labs: Building open permissionless protocols for decentralized governance. Website Paragraphs 1, 4, 5, and 6. Published by Mehrotha, Vedika, Somesh Blockchain Labs., New Delhi India, UNICEF., New York, USA Somish Blockchain Labs: Building open permissionless protocols for decentralized governance | UNICEF Innovation Fund (accessed 19 September 2021)

526 Gerbert, Philipp., Hartman, Philipp., Liebl, Andreas., Trost, Markus., and Pfister, Emanuel of Odgers Berndtson (2020) *Artificial Intelligence for Board, Gearing up for the Future of Business* Pages 4, 5, 29 Published by Odgers Berndston, Garchig, Germany, Available at https://www.odgersberndtson.com/en-de/insights/how-ai-will-change-your-

Shaw, J. (2020) states New Zealand became the first in the world to outline a set of standards to guide the use of algorithms by public agencies, that algorithms play a crucial role in helping us to make connections and identify relationships and patterns across vast quantities of information. This helps to improve decision-making and leads to benefits such as the faster delivery of targeted public services. He states

> "Most New Zealanders recognise the important role algorithms play in supporting government decision-making and policy delivery, however they also want to know that these systems are being used safely and responsibly. The Charter will give people that confidence. It will help to build public trust over the long term, meaning that we can unlock the full potential of data to improve people's lives.
>
> "Today we have set a world-leading example of how government can work with diverse groups of people, communities and organisations to improve transparency and accountability in the use of data. It is an example that we hope others will follow," 527

The Department of Justice in New Zealand Algorithm Charter sets out details of algorithms they use within the collection services business unit. The New Zealand Ministry for Justice Website (2021) notes they manage a large number of outstanding fines, infringements and reparation arrangements also other debt files to collect daily and they need to prioritise their work. They use a task generator algorithm to automate a repetitive manual process which enables a larger volume of work to be captured prioritised and distributed. The task generator is described as using "a points system based on case information and prioritises and distributed tasks to collections registry officers and bailiffs,

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role-as-an-ceo-and-how-to-prepare-for-it Applying-AI-Artificial-Intelligence-for-Boards-vf-4.pdf (frb.io) (accessed 05 September 2021)

527 Shaw, J. (2020) New Algorithm Charter World First Website https://www.beehive.govt.nz/release/new-algorithm-charter-world-first

based on available participant information and Ministry priorities". Algorithm Charter Risk matrix assessed the Task Generator risk as "low", noting that "impact of an error being tasks would result in tasks being incorrectly prioritised, but is unlikely to negatively affect participant outcomes", and it was also noted that "the Collections Registry Officer regularly reviews the priority list, which reduces the likelihood of errors occurring". The New Zealand Ministry for Justice Website (2021) also stated:

> "Humans, rather than computers, review and decide on almost all significant decisions made by government agencies. As agencies continue to develop new algorithms, it's important to preserve appropriate human oversight and ensure that the views of key stakeholders, notably the people who will receive or participate in services, are given appropriate consideration."528

528 New Zealand Government, Ministry for Justice (2021) *The Algorithm Charter* Website of the Ministry for Justice at https://www.justice.govt.nz/justice-sector-policy/key-initiatives/cross-government/the-algorithm-charter/ (Accessed 05 September 2021)

**Story 6: AI bringing transparency and accountability, an Algorithm used by the Department of Justice in New Zealand identifying new contact details for debtors**

The Department of Justice in New Zealand has an Algorithm Charter. It states: "Humans, rather than computers, review and decide on almost all significant decisions made by government agencies. As agencies continue to develop new algorithms, it's important to preserve appropriate human oversight and ensure that the views of key stakeholders, notably the people who will receive or participate in services, are given appropriate consideration.

The Algorithm Charter is a commitment by government agencies to manage their use of algorithms in a fair, ethical and transparent way."

They manage a large number of outstanding fines, infringements and reparation arrangements also other debt files to collect daily and they need to prioritise their work. and they use a task generator algorithm to automate a repetitive manual process which enables a larger volume of work to be captured prioritised and distributed. The task generator uses a points system based on case information and prioritises and distributed tasks to collections registry officers and bailiffs, based on available participant information and Ministry priorities. They use an Algorithm Charter Risk matrix and assess the Task Generator risk as low, noting that the impact of an error being tasks would be incorrectly prioritized, and noted the priority list is reviewed by a Collections Officer.

Should every government and government entity have an Algorithm Charter? As a citizen should we be involved in the decision of a government entity to use AI? How would we govern this? An entity is a public body.

**Figure 4.28 AI bringing transparency and accountability, an Algorithm used by the Department of Justice in New Zealand, (2021) scenario by Marita Gonsalves**

An Algorithm Charter allows all stakeholders know the extent and remit of AI in Government entities, supporting Humans and AI in partnership. The next story considers AI working with Humans in a company.

Woddie, Alex., (2021), reported about an Irish company called Keelvar Ltd[529] which uses AI-powered sourcing bots which replicate human shipping buyers' activity, including bidding for coveted spots in limited freight lanes. He noted one of the impacts of Covid-19 is a significant increase in shipping, and that there was a substantial increase in bidding activity for a limited number of freight lanes which meant staff spent extra time to ensure their companies meet their logistical goals. The sourcing bots can take an instruction, do a multi-phase job, figure out how best to do it, and revert for guidance at key points. The bots significantly reduce the manual work ordinarily required of the human. The article records the company CIO statement:

> Bots are able to establish spot bidding events within minutes, managing and automating tedious tasks such as inviting carriers, collecting and validating bid data from carriers, messaging bid status updates, conducting necessary rate card and lane information lookups, and generating award recommendations," he says. "As a result, companies can increase competition and savings, improve decision quality, increase process compliance, traceability, and ensure operational continuity with less risk.530

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[529] Keelevar.com., (2021), Intelligent sourcing automation, Keelevar.com, Cork, Ireland website available at https://www.keelvar.com/intelligent-sourcing-automation (accessed 26 February 2022).

530 Woodie, Alex., (2021) *Sourcing Bots to Keep Freight Moving* Paragraphs 1-12. Published by Woodie, Alex., Datanami.com News Portal, USA, available at https://www.datanami.com/2021/02/04/sourcing-bots-bid-to-keep-freight-moving/ (accessed 11 September 2021)

**Story 7: Governing by AI: The AI powered sourcing bot for procurement.**

> I am your digital colleague an AI-powered sourcing bot. We are a team of sourcing bots, and we work with you doing human shipping buyer's activities including we bid for those coveted spots in limited freight lanes. We can set up spot bidding events, invite carriers, collect and validate bid data from carriers, notify our human managers about bid status updates. We can look up about rate cards and land information. We check with our human if we need any clarification or at agreed steps. We help reduce staff additional working hours in this Covid world as many had to work even longer hours to meet the company logistical goals. We also generate award recommendations and in the past few months.
>
> What ethics issues would there be if AI managed procurement for government? What benefits do you think there would be for citizens if AI managed procurement services in government? What services or goods would you consider Government could procure using AI bots?
>
> Website: Datanami at https://www.datanami.com/2021/02/04/sourcing-bots-bid-to-keep-freight-moving/

**Figure 4.29 Governing by AI: The AI powered sourcing bot for procurement, (2021) adapted scenario by Marita Gonsalves**

Kuziemski, M., and Misuraca, G., (2020), state the public sector's predicament is a tragic double bind that its obligations to protect citizens from potential algorithmic harms are at odds with the temptation to increase its own efficiency, or in other words, to govern algorithms while governing by algorithms, Government legitimacy and citizen empowerment, two key issues high on the policy agenda at global level, have a bearing on the future of our democratic systems and the need to rethink governing in the digital age. They state:

> In particular, the governance of AI and its underpinning data ecosystem has become a crucial policy issue as more and more innovations are based on large scale data collections from digital devices, and the real-time accessibility of information and services, contact and relationships between institutions and citizens could strengthen – or harm - democracy and trust in governance systems.531

531 Kuziemski, Maciej., and Misuraca, Gianluca., (2020), AI governance in the public sector: Three tales from the frontiers of automated decision-making in democratic settings.

But what about the future and citizen perspectives on how our generation have handled this global paradigm shift today? National Archives was originally a first port of call when seeking to learn about the past. In Ireland there are large irretrievable gaps in our national archives due to a civil war.

In 1922 Ireland's Public Records Office of Ireland was burned and all records within were destroyed, during Ireland's Civil War. Today National Archives Ireland (2021) "seek to ensure preservation of the public record as a force for good, for research, for debate and for discovery." Referring to the digital era they state, "in an age of manipulation of information, we must point to the archival record, and promote its integrity, authenticity, reliability and availability" that in today's world "the need for access to data is paramount" but that " often the need for systems and processes to ensure the long-term preservation of that data is regarded as secondary" and they as part of their ongoing strategy, "will enhance, develop and deploy physical and virtual infrastructures to build a secure footing for Ireland's public record in paper and born-digital formats", "support and assist in compliance initiatives across the Irish civil service such as Build to Share and Open Data. 532

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Pages 1, 15. Published by https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7164913/ (accessed 19 September 2021.

532 National Archives, Ireland, (2021), Shaping our Future in the Information Age. Pages 6 and 15. Published by National Archives, Dublin, Ireland, at https://www.nationalarchives.ie/wp-content/uploads/2021/03/NA-Strategic-Plan-2021-25_FINAL_RSZ.pdf (accessed 15 September 2021)

Everything a National Archive does is about the citizen, accountability, and governance. I attended a conference on Archiving, to understand about how digital archiving and AI ML use archives data as this is happening globally today. The speakers voiced concern that systems were being developed without their input in terms of ICT solutions data governance, that digital records are outsourced to commercial providers and that privatised bodies records needed to be considered. It made me think about government financial records outsourced to 3rd parties to manage. The National Records of Scotland strapline is, "Preserving the past, Recording the present, Informing the future." 533 The Keeper of Records in Scotland has a model, the Keepers Model, which includes best practices requirements for public records created or held by 3rd parties for inclusion in contracts534.

I had, at that conference heard Archivists experiences from Ireland, Scotland, Denmark, and New Zealand. The Keeper of Records is a very powerful role. Denmark had commented that their archives are missing the information collected by private enterprises about infrastructure, climate and other commenting that public records are in fact, dull, but they contain stories that can be made alive just like census information. New Zealand commented on 3rd parties holding information on behalf of government and the need to

533 National Records of Scotland., (2021) *website https://www.nrscotland.gov.uk/* (Accessed 15 September 2021)

534 National Records of Scotland., (2021) The Keepers Records Management Plan. https://www.nrscotland.gov.uk/files//record-keeping/public-records-act/ModelPlan.pdf (Accessed 15 September 2021) see also https://www.nrscotland.gov.uk/record-keeping/public-records-scotland-act-2011/resources/model-records-management-plan (Accessed 26 February 2021)

have archives noted in any contract when being drafted and advised about the use of AI, ML and Robots, AI used for document autoclassification, retroactively classifying, post transfer classification, security, mentioning an agreement so people can access gov archives for the last 30 years.

It made me think about financial records and AI. I thought about a process I encountered in government the right to inspect the books and records forming the accounts of a financial year, in local government, the right to then query an item, inclusion or exclusion of an item, with the auditor, and if warranted to raise an objection at audit. Imagine, if AI was brought into this process, the transparency possibilities. A DAO records are auditable and open. UNICEF state that "by sharing the public records of crypto transfers, the CryptoFund aspires to create visibility for the donor and the public, adding a layer of transparent accounting to the donation and investment processes"535 Could AI be used to inspect digital books and records?

535 UNICEF., (2021), Leveraging Blockchain for Financial Inclusion https://www.unicef.org/innovation/InnovationFund/blockchain-financial-inclusion-cohort (accessed 18 September 2021)

**Story 8: AI bringing transparency and accountability, Inspection of Books and Records and Objection to Accounts in Government**

My name is Pip. I am AI software. I belonging to an elector of your local council district. I would like to look at the books and records of my local council. As a human citizen you can do this as our local council makes its accounts available for inspection for a period of 30 working days. The dates appointed for the audit and the specific dates for the inspection are advertised in advance. The council's accounts which are to be audited including books, deeds, contracts, bills, vouchers and receipts relating to them, can be viewed and arrangements will be made for you to view the books and records, within the council's premises. You can get copies of the accounts and relevant documents. You can't inspect documents that are not relevant to the accounts or are otherwise legally protected.

You also have the right to ask the auditor questions about the accounts if you are an elector for the area to which the council's accounts relate, or any representative of the elector. You may only ask the auditor questions about the accounts for the year that they are auditing.

The auditor cannot answer questions about the Council's policies, finances & procedures or anything else that is not directly relevant to the accounts. If you want to object to the Council's accounts, you must give formal notice of your objection, in writing, to the auditor.

To inspect the accounts please contact the Chief Finance Officer.

My elector would like me to inspect the books and records. I am representing my elector and can come onsite virtually.

As the Chief Finance Officer, would you let me inspect the accounts and books and records?

Should AI software be used to examine digital books and records and report findings to the elector requesting access to books and records?

Note: An elector is a person who has a right to vote in an election.

Should this right be given to all citizens resident in a country?

Should this inspection output be archivable?

**Figure 4.30 AI enhancing transparency and accountability in Inspection of Books and Records and Objection to Accounts in Government, (2021) scenario by Marita Gonsalves**

Goudarouli, E., of the national archives UK., (2021), blog, highlighted the ethical implications of the use of AI and advanced computational approaches to archival practices

and archival research, based on participants' experiences deriving from different research contexts and parts of the world.536

So many emerging concepts, a Robot Citizen, citizen rights, in a world where statelessness exists. Governance by a Robot Citizen contributing to public policy on an area impacting AI, or indeed any policy consultation. AI ethics and crowdsourcing same just as stories were crowdsourced for Reinforcement Learning, DAOs, VITAL, Board Voting rights. Issues of concern relating to AI ethics, Public Policy, Governance by AI all relating to the research question, on how an AI governance framework benefits public policy.

The stories above, sought to describe scenarios where AI is reshaping governance boundaries or where citizen voice should be augmented by AI. One area I didn't explore was Quantum AI in stories. It would have been the same story style as crowdsourcing autonomous vehicles AI ethics a space for citizen voice but already told. Quantum AI Ethics, had been identified as an area which was currently in its infancy in discussion at the Transforming Industry.com (2021), webinar.537 The World Economic Forum (2021) global multi-stakeholder initiative to create an ethical framework enabling the responsible design and adoption of quantum computing website states:

> The most appropriate and effective time to consider the ethical implications of a technology is when that technology is still in the design and development phase as

536 Goudarouli, Eirini., Dr. of National Archives UK., (2021), AI and archives: Current challenges and prospects of digital and born-digital archives paragraph 11 Blog by Goudarouli, Eirini., Dr. of National Archives UK., at https://www.nationalarchives.gov.uk/about/our-research-and-academic-collaboration/our-research-and-people/staff-profiles/dr-eirini-goudarouli/ (accessed 04 March 2022)

537 Transforming Industry.com (2021) Quantum AI plus Machine Learning at https://transformindustry.com/events/quantum-ai-and-machine-learning-global-2021/ Attended 08 September 2021 [Discussion observation. No download available]

> it allows for early intervention. Ethical concerns in quantum computing are just starting to be discussed, however, ethical "guidelines" do not yet exist globally. Drawing on the learnings of ethical principles and approaches to mitigating risks and unintended consequences in other emerging technologies like AI, nanotech, nuclear energy, and GMOs, there is a need to study the ethical implications of the technology. Quantum computing related risks can be mitigated through a selection of effective governance and policy measures, while creating awareness among relevant stakeholders. Developing effective guidelines for the public and private sectors, academia and other stakeholders is timely if we want to promote the adoption of responsible quantum computing.538

I first heard about quantum mechanics in physics class at school. Marr, B., (2021) describes quantum computing and AI in terms of autonomous vehicles and the data needed to train the algorithm.539 Gribbin, J., (1987) stated that what quantum mechanics says is that nothing is real, that we cannot say anything about what things are doing when not looking at them, that Schrödinger's mythical cat was invoked to make the differences between the quantum world and the everyday world clear, that the cat in the box is both alive and dead in different worlds, and that, whilst sounding like science fiction it goes far deeper than any science fiction and is based on impeccable mathematical equations a consistent and logical consequence of taking quantum mechanics literally, that we live in exciting times, that physics is about probing into the unknown.540 There is so much

538 The World Economic Forum (2021) Quantum computing governance webpage Paragraph 2, 'the opportunity' Published by the World Economic Forum, Cologny, Geneva, Switzerland. Available at https://www.weforum.org/projects/quantum-computing-ethics (accessed 07 December 2021)

539 Marr, Bernard., (2021) blog website *What is the next level of AI technology https://bernardmarr.com/what-is-the-next-level-of-ai-technology/* (Accessed 05 September 2021).

540 Gribbin, John., (1987), *In search of Schrödinger's Cat Quantum Physics and Reality.* Pages 2, 238, 274 and 275. Published by Corgi Books, London, UK. 0 552 12555 5

potential in the quantum space, truly exciting. The European Commission (2021) highlighted that all 27 EU member states are now committed to building an EU quantum communication infrastructure, working alongside the European Commission and the European Space Agency known as EuroQCI a secure quantum communication infrastructure that will span the whole EU and which will be part of the space-based secure connectivity system currently being planned for high-performing and secure networks for Europe's businesses, governments and educational institutions.541

### 4.8.3 A quiet but insightful citizen voice

> *Collect evaluative data and analyse it.* What is happening in this situation now as understood by the various participants? Using research methods, what can we find out about it?

I sought to obtain data from 3 locations, Carnegie Council Global Ethics Day Platform, the Council on the Future of Europe Platform and through the United Nations AI discussion platform, at the United National University Centre for Policy Research (UNU-CPR). The UNU-CPR AI and Global Governance Platform moderator rejected my request on November 13, 2021, stating that they were not currently seeking contributions to the platform. "Thank you for your interest in UNU-CPR. We are not currently seeking contributions for the AI & Global Governance platform, but if you wish to send us the

541 European Commission., (2021), All member states are now committed to building an EU quantum communication infrastructure. Paragraph 2 Published by Digibyte, the European Commission, Brussels, Belgium, at https://digital-strategy.ec.europa.eu/en/news/all-member-states-now-committed-building-eu-quantum-communication-infrastructure (accessed 18 September 2021)

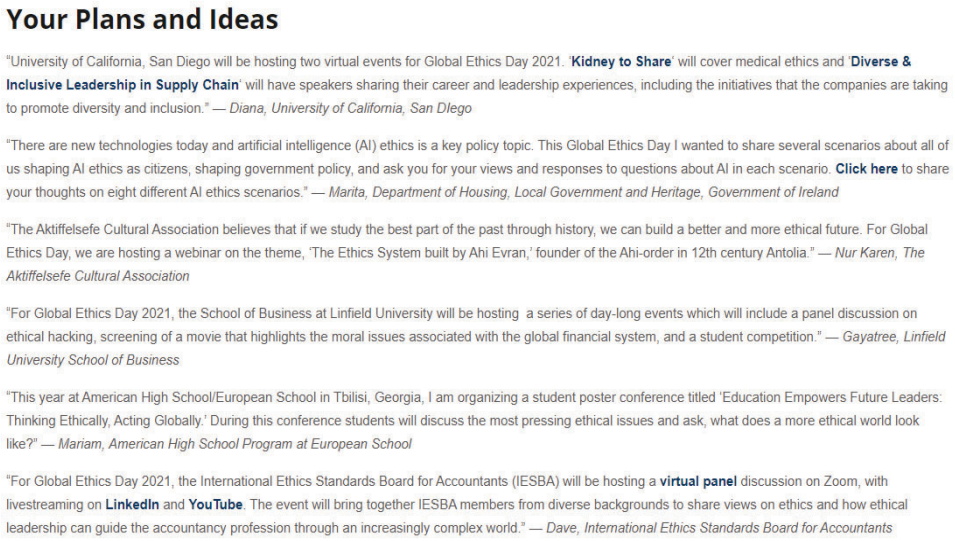
article for future consideration, do feel free to send the draft piece to this address. Kind regards, UNU-CPR Communications"542

The first data collected was through Carnegie Council on Global Ethics Day. To obtain this data I had to obtain Department approval to being named as a participant on the Carnegie Council site as the administrator had advised me that this year (2021), only Institutions were represented. I obtained this from my HR section although it was caveated as supportive but not to advertise, citing ethics terms. I wasn't surprised as Carnegie Council had also noted that it would be unethical to promote my doctorate but were happy to share the stories once endorsed by the Department. I also attended one Global Ethics Day event.

My scenarios were uploaded as one of the events onto the Carnegie Council website543 I didn't get opportunity to attend the IESBA discussion.

542 UNU-CPR Communications., (2021), UNU-CPR Contact Form - mrs marita gonsalves response Saturday November 13, 2021, replied to maritagonsalves@gmail.com

543 Carnegie Council (2021) Global Ethics Day website, New Technologies and AI Ethics Scenarios Marita Gonsalves, Department of Housing, Local Government and Heritage (DHLGH), Published by Marita Gonsalves, Dublin, Ireland, Carnegie Council, USA available at https://www.globalethicsday.org/global-ethics-day-2021/ (accessed 06 November 2021)



## Your Plans and Ideas

"University of California, San Diego will be hosting two virtual events for Global Ethics Day 2021. '**Kidney to Share**' will cover medical ethics and '**Diverse & Inclusive Leadership in Supply Chain**' will have speakers sharing their career and leadership experiences, including the initiatives that the companies are taking to promote diversity and inclusion." — *Diana, University of California, San Diego*

"There are new technologies today and artificial intelligence (AI) ethics is a key policy topic. This Global Ethics Day I wanted to share several scenarios about all of us shaping AI ethics as citizens, shaping government policy, and ask you for your views and responses to questions about AI in each scenario. **Click here** to share your thoughts on eight different AI ethics scenarios." — *Marita, Department of Housing, Local Government and Heritage, Government of Ireland*

"The Aktiffelsefe Cultural Association believes that if we study the best part of the past through history, we can build a better and more ethical future. For Global Ethics Day, we are hosting a webinar on the theme, 'The Ethics System built by Ahi Evran,' founder of the Ahi-order in 12th century Antolia." — *Nur Karen, The Aktiffelsefe Cultural Association*

"For Global Ethics Day 2021, the School of Business at Linfield University will be hosting a series of day-long events which will include a panel discussion on ethical hacking, screening of a movie that highlights the moral issues associated with the global financial system, and a student competition." — *Gayatree, Linfield University School of Business*

"This year at American High School/European School in Tbilisi, Georgia, I am organizing a student poster conference titled 'Education Empowers Future Leaders: Thinking Ethically, Acting Globally.' During this conference students will discuss the most pressing ethical issues and ask, what does a more ethical world look like?" — *Mariam, American High School Program at European School*

"For Global Ethics Day 2021, the International Ethics Standards Board for Accountants (IESBA) will be hosting a **virtual panel** discussion on Zoom, with livestreaming on **LinkedIn** and **YouTube**. The event will bring together IESBA members from diverse backgrounds to share views on ethics and how ethical leadership can guide the accountancy profession through an increasingly complex world." — *Dave, International Ethics Standards Board for Accountants*

**Figure 4.31 Carnegie Council, Global Ethics Day 2021 20 October, Event AI Technologies, Marita Gonsalves, outline under plans and ideas and link to the AI scenarios form on the Carnegie Council Global Ethics Day 2021 website**

As per the Carnegie Council moderators' recommendation I used social media to advertise my event. I posted on Facebook to Friends only. I posted on LinkedIn to everyone. Both posts were uploaded Monday 18 October 2021.

Only one response was received independently, and one other because of my social media outreach, the response rate was disappointing, in terms of numbers but both responses were extremely insightful in terms of the actual responses.

### 4.8.4 questioning AI bias, political manipulation of robots, and questioning the right to inspect public sector financial books and records by citizens who have criminal or terrorist convictions

*Review the data and look for contradictions.* What contradictions are there between what we would like to happen and what seems to happen?

I reviewed the responses and looked for contradictions. The contradictions weren't significant, but made me think about:

- algorithmic transparency,
- citizen equality,
- AI Voting Rights being reassessed by citizens,
- How AI was seen as fairer than humans in procurement with proper oversight.

The insight about the citizen right to access local authority books and records, with a record of crime or terrorism, accessing its very financials and other data that might be subject to GDPR, and the insights pre-programming of Robot Citizens and many other ideas raised for consideration.

| Timestamp on Google Form | Scenario 1 | |
|---|---|---|
| Timestamp | Question: As citizens how can we participate in crowdsourcing AI ethics for autonomous vehicles? | Question: As citizens should we crowdsource AI ethics as part of Public Policy? |
| 2021/10/20 2:50:10 PM GMT | Town users shold pay a fee for this privilidge. | we should |
| 2021/10/24 7:15:28 AM GMT | Whether pre-written in AI or decided on the moment by humans the outcome is likely to be a tragic accident. People still should be asked for their opinions as they should always be included in policy that affects them. | Yes. |

**Table 4.3 Findings for Scenario 1 Crowdsourcing AI Ethics, Source responses Google Form on the Carnegie Council Global Ethics Day 2021 website on 06 November 2021**

The input of citizens crowdsourcing AI ethics as part of public policy was noted, but. I was surprised to note that town users should pay a fee for the privilege of crowdsourcing AI Ethics.

| Timestamp on Google Form | Scenario 2 | |
|---|---|---|
| Timestamp | Question: If Sophia moved to your country and became a Robot Citizen of your country, and responded to a policy consultation, identifying herself as Sofia, would you want her views taken into account? | Question: What ethics considerations are there, if any, in this scenario for you? |
| 2021/10/20 2:50:10 PM GMT | no, they might be pre-programmed by a political source | There is a doubt as to its authenticity |
| 2021/10/24 7:15:28 AM GMT | Yes as those views will have been calculated by AI better than most humans are capable of doing. | Human considerations should always be put through AI to be calculated fro errors as AI sees it. |

**Table 4.4 Findings for Scenario 2 AI Robot Citizen, Source responses Google Form on the Carnegie Council Global Ethics Day 2021 website on 06 November 2021**

The observation on pre-programming by a political source was something I had not considered before. I had considered biased data and Robotics, but not political manipulation of Robots. I began to think about war, neutrality, one of the concepts noted as important in the literature review. Would technology neutrality appear in the documents reviewed in cycle 5?

| Timestamp on Google Form | Scenario 3 |
|---|---|
| Timestamp | Question: Should AI have the right to an equal Vote on a Board of Directors? |
| 2021/10/20 2:50:10 PM GMT | It depends on what they are directing. |
| 2021/10/24 7:15:28 AM GMT | Yes |

**Table 4.5 Findings for Scenario 3 Should AI have the right to an equal vote on a Board of Directors? Source responses Google Form on the Carnegie Council Global Ethics Day 2021 website on 06 November 2021**

Acknowledging the Voting right of AI was accepted by both respondents with the caveat of it depends on what they are directing by one respondent, which made me think as to how this could be achieved, perhaps under the Memo and Articles of Association. Was this being done already in AI DAOs?

| Timestamp on Google Form | Scenario 4 | |
|---|---|---|
| Timestamp | Question: Do you think your government should adopt cryptocurrency? | Question: How can we as citizens be involved in developing this new and inclusive financial space? |
| 2021/10/20 2:50:10 PM GMT | No | I don't know and don't advise it. |
| 2021/10/24 7:15:28 AM GMT | No | Be very wary of it too open to fraud by rogue elements of society. |

**Table 4.6 Findings for Scenario 4 Mixed views about Cryptocurrency, Source responses Google Form on the Carnegie Council Global Ethics Day 2021 website on 06 November 2021**

Interestingly both respondents were opposed to their governments adopting cryptocurrency, one very strongly and the second noting the risk of fraud by rogue elements of society.

In Ireland the New Technologies Risk Assessment by the Department of Finance (2019) states crowdfunding and virtual currencies "have been given risk ratings of medium-high," and "new regulations are being considered in order to mitigate the

associated risks" noting the "extensive work at international level in order to develop satisfactory definitions of the terms involved" and that "this work will also support further mitigation measures at the domestic level."544.

| Timestamp on Google Form | Scenario 5 | |
|---|---|---|
| Timestamp | Question: Thinking about this technology in the context of government today would you want a DAO to operate providing some public services? | Question: What services do you think should be provided in this way? |
| 2021/10/20 2:50:10 PM GMT | It would also require some human control. Proposals from the DAO could then be monitored by real persons who are qualified to know about the basic subject. | I don't see any limit but the degree of human viteoing should determine which are most unsuitable. |
| 2021/10/24 7:15:28 AM GMT | Yes AI has a role. | All service provision benefits by being looked at by AI. |

**Table 4.7 Findings for Scenario 5 Human governance is needed for AI Decentralised Autonomous Company (DAO) public services provision Source responses Google Form on the Carnegie Council Global Ethics Day 2021 website on 06 November 2021**

The benefit of AI DAOs was noted and again the concerns/caveats noted related to human involvement needed, something which could be written into the Company Memo and Articles of Association. Does this need to be considered in an updated risk assessment as an emerging technology and different use. The emphasis placed on the need for human

544 Government of Ireland, Department of Finance., (2019), New Technologies Risk Assessment Page 26 Published by the Department of Finance, Dublin, Ireland available at https://assets.gov.ie/8244/86f467f3a9ca4a6b87d29bec6885523f.pdf (accessed 07 November 2021)

oversight control is noted, also, the importance of the ability of those monitoring to know about the basic subject, which in this instance includes public financial management to be appropriately qualified in the subject so that they could critically monitor and review AI output. Consideration of AI software such as VITAL in this process is another matter for Governance by AI a DAO with an AI board member or an all-AI board.

| Timestamp on Google Form | Scenario 6 | | |
|---|---|---|---|
| Timestamp | Question: Should every government and government entity have an Algorithm Charter? | Question: As a citizen should we be involved in the decision of a government entity to use AI? How? | Question: How would we govern this? |
| 2021/10/20 2:50:10 PM GMT | yes | After we are elected to a responsible position where we are involved in this. | The use of what is often regarded as common sense. |
| 2021/10/24 7:15:28 AM GMT | Yes | Yes by referendum. | By vote. |

**Table 4.8 Findings for Scenario 6 Algorithm Charter Source is a right step responses Google Form on the Carnegie Council Global Ethics Day 2021 website on 06 November 2021**

The response was yes about every government and government entity having an Algorithm Charter. But the respondents disagreed as to the role of the citizen, one saying yes by referendum and the other saying only after election to a responsible position. The Transparency of an Algorithm Charter made me think about the concepts of misinformation and disinformation. The EU (2021) define misinformation as "verifiably false information spread without the intention to mislead…often shared because the user believes it to be true" and disinformation as "verifiably false or, misleading information, created, presented and disseminated for economic gain or to intentionally deceive the

public”545 and their factsheet on Action Plan Against Disinformation states that “disinformation is an evolving challenge with high potential to negatively influence democratic processes and societal debates.” 546

This work is acknowledged by the Carnegie Endowment for International Peace (2021) but they stated “Many argue that disinformation and public debate driven by artificial intelligence undermine this fundamental right in this space.547

The Financial Action Task Force (FATF), (2021) makes the point that there are opportunities to use AI and its associated technologies in AML/CFT (anti money laundering and countering financing of terrorism) noting different benefits for the Public and Private sectors.

> The increased use of digital solutions for AML/CFT based on Artificial Intelligence (AI) and its different subsets (machine learning, natural language processing) can potentially help to better identify risks and respond to, communicate, and monitor suspicious activity. At public sector level, improved live (real-time) monitoring and information exchange with counterparts enable more informed oversight of regulated entities, helping to improve supervision. At private sector level, technology can improve risk assessments, onboarding practices, relationships with

545 European Commission (2021) Webpage, Tackling Online Disinformation Published by the EU, European Commission, Belgium, Brussels paragraph 2 available at https://digital-strategy.ec.europa.eu/en/policies/online-disinformation (accessed 06 November 2021, website last updated 23 September 2021)

546 European Commission (2021) Factsheet on Action Plan Against Disinformation Published by the EU, European Commission, Belgium, Brussels Paragraph 1 available at https://eeas.europa.eu/sites/default/files/disinformation_factsheet_march_2019_0.pdf (accessed 06 November 2021, website last updated 23 September 2021)

547 Carnegie Endowment for International Peace (2021) Webpage, EUs role in fighting disinformation, taking back initiative, Published by Carnegie Endowment for International Peace USA available at https://carnegieendowment.org/2020/07/15/eu-s-role-in-fighting-disinformation-taking-back-initiative-pub-82286 (accessed 06 November 2021)

competent authorities, auditability, accountability and overall good governance whilst cost saving. 548

The transparency of an Algorithm Charter by all public sector entities and governments, would be a very positive step addressing the misinformation and disinformation risks globally and would also benefit AML/CFT.

Ethics issues were considered in terms of AI management of procurement for the government.

548 The FATF., (2021),Opportunities and Challenges of New Technologies page 4 Published by the FATF, Paris, France, available at https://www.fatf-gafi.org/publications/fatfrecommendations/documents/opportunities-challenges-new-technologies-for-aml-cft.html (accessed 07 November 2021)

| Timestamp on Google Form | Scenario 7 | | |
|---|---|---|---|
| Timestamp | Question: What ethics issues would there be if AI managed procurement for the government? | Question: What benefits do you think there would be for citizens if AI managed procurement services in government? | Question: What services or goods would you consider Government could procure using AI bots? |
| 2021/10/20 2:50:10 PM GMT | It should be balanced between low cost and high performance. Compromises must be properly programmed so that neither extreem would actually and necessaril;y get the contract. | If this applied there would be some possibility of better decision-making, but it would depend on the quality of the AI system and criteria should be arranged to ensure this was highly stable and ethically run. | Basic health service, applications for housing by homeless persons, drug users support with some human use too. |
| 2021/10/24 7:15:28 AM GMT | Humans might feel out of the loop but in this case its a good thing. | It would be fairer. | All of them. |

**Table 4.9 Findings for Scenario 7 AI managed procurement, humans in/out of the loop? source responses Google Form uploaded onto the Carnegie Council Global Ethics Day 2021 website form 06 November 2021**

Interestingly the balance between cost and performance was noted, and the need for proper programming, to ensure fairness in competition were highlighted also the observation that humans 'out of the loop' possibly being a good thing. In different ways both noted the need for fairness and accuracy for different reasons, the possibility of better decision-making depending upon the quality of AI systems and criteria including the need for stability and ethical basis were noted. One responded that all Services and Goods could be procured with AI support the second response noted Government reflected on services procurement referencing basic health services, application for housing by homeless persons, and drug users support, noting that the route for service provision, 'with some human use too' suggesting the need for 'human in the loop'.

| Timestamp on Google Form | Scenario 8 | | | |
|---|---|---|---|---|
| Timestamp | Question: As the Chief Finance Officer, would you let me inspect the accounts and books and records? Why/Why not? | Question: Should AI software be used to examine digital books and records and report findings to the elector requesting access to books and records? | Question: Should this right be given to all citizens resident in a country? | Question: Should this inspection output be archivable? |
| 2021/10/20 2:50:10 PM GMT | I would have to respond and see if the AI device comes from a non-biased source, as a free citizen. | If the elector agrees. | Probably there are exceptions because not every citizen has no record of crime or terrorism, | Yes. |
| 2021/10/24 7:15:28 AM GMT | Chief Finance Officer is human and might not let it happen but they should. | Yes. | Maybe to elected representatives. | Yes. |

**Table 4.10 Findings for Scenario 8 AI examining books and records under a legal process in place for citizens in local government, paying for that access and citizens with criminal convictions or terrorists source responses Google Form uploaded onto the Carnegie Council Global Ethics Day 2021 website form 06 November 2021**

The response in relation to a non-biased source, as a free citizen was insightful as governance involves, People, Process and Technology and the source of the citizen enquiry is something not legislated for in the current legislation supporting the right to view books and records. What if the citizen making the enquiry had a record of crime or terrorism? Currently such a record would make no difference if the citizen was a ratepayer (Ireland) or elector (UK). Should it? It should be debated as that legislation although pre-digital, has never asked that question.

I noted the comment that the Chief Finance Officer is human. An assumption, particularly in the growing world of AI DAO space and if such a request were made to an all-AI board would it be legal?

But also, would AI Continuous Financial Reporting address the citizen oversight inspection space in a different way? And in that space do we need to reflect on whether there should be conditions for accessing some information.

### 4.8.5 AI at a new Forefront of Democracy?

> *Tackle a contradiction by introducing change.* By reflecting critically and creatively on the contradictions, what change can we introduce which we think is likely to be beneficial?

I was still puzzled by the low response rate to the AI scenarios. I wanted to understand the poor response rate. Was it that AI, ethics, and emerging technologies are not seen as important, yet some of the insights in the two responses shaped my thinking? Carnegie Council hosted a special virtual where we heard directly from those fighting on the frontlines to uphold and strengthen democracy. I attended the seminar 'On the Frontlines of Democracy.

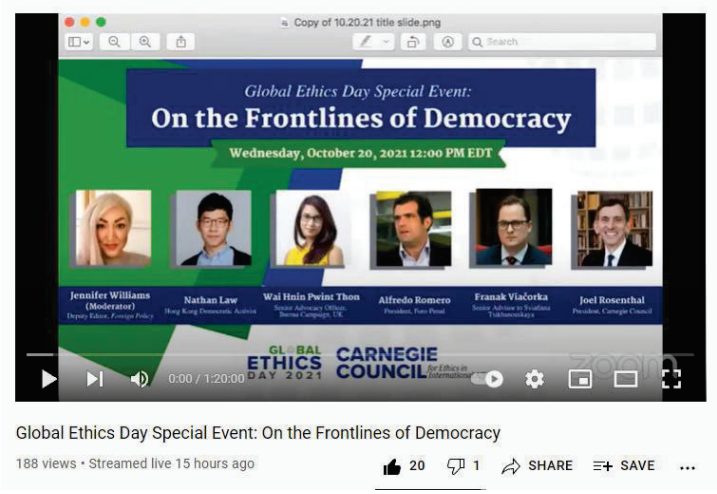



**Figure 4.32 Carnegie Council Global Ethics Day Event: On the Frontlines of Democracy available at** https://www.youtube.com/watch?v=xWenb8_Fy4k **(attended 20 October 2021)**

I downloaded the audio and transcript of the debate and analysed in Leximancer, hoping to understand better in terms of the thinking about technology. I had noted some truly excellent points, the global democracy discussion, was focusing on human suffering and institutional roles and indeed their shortcomings in a difficult space.

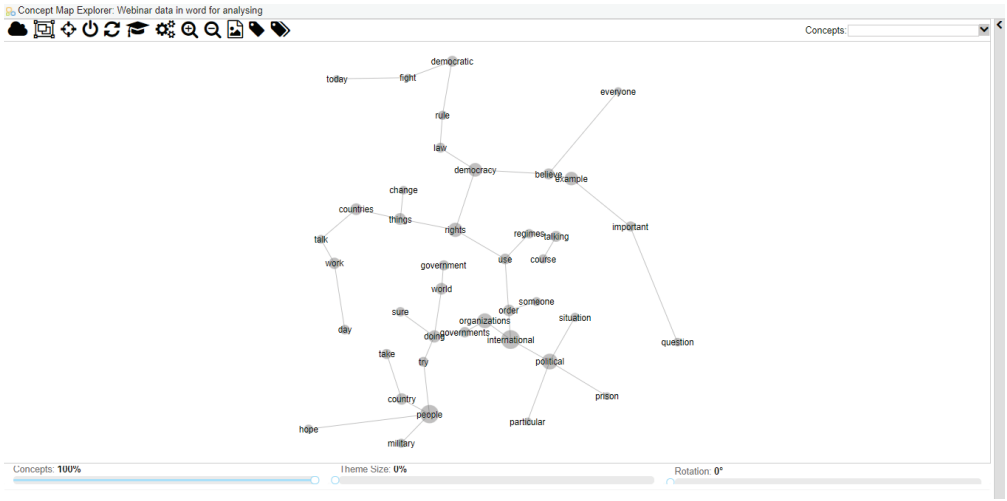



**Figure 4.33 Carnegie Council Global Ethics Day Event: On the Frontlines of Democracy source Leximancer, Concepts map concepts 100% Themes 0%**

I first looked at the concepts and was struck by people focus but noted also that technology was important. The comments about democracy resonated including “What is your pitch to the younger generation on why democracy itself is critical and why it's something worth fighting for? I would love to hear from each one of you before we move on.” and, “It's clear that humanity faces a number of global-scale challenges.”

AI ethics are a global-scale challenge and opportunity to address many Democratic challenges, yet there wasn’t any word association for ‘technology’ in all the dialogue. Why? Perhaps because the focus needed to be on people in this space. I’d noted one specific comment about the United Nations and other multilateral organisations not being up to the job, that had surprised me to hear so I confirmed it again in the transcript.

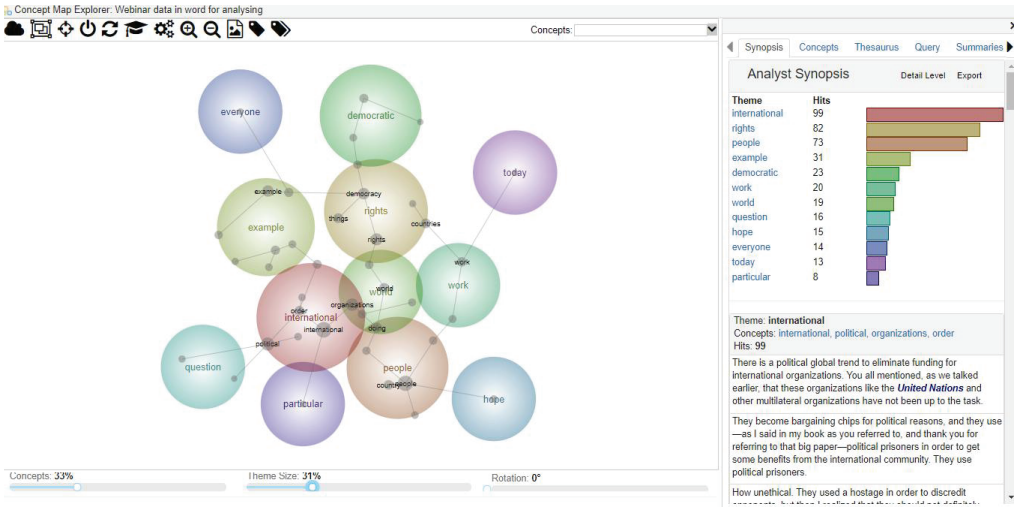



**Figure 4.34 Discussion where it was felt that the United Nations and other Multilateral Organisations had not been up to the task. Carnegie Council Global Ethics Day Event: On the Frontlines of Democracy source Leximancer, Concepts map concepts 33% Themes 33%**

The Carnegie concepts map highlighted the importance of speaking up when organsations in Venezuela do wrong referencing funding "If nobody says anything and we just from ***Venezuela*** are saying that, but if nobody is helping us saying that specifically to those organizations when they act wrong or don't do whatever they have to do, they will be comfortable doing what they're doing because nobody is telling them anything, and also governments are providing funding to them." The conversation continued with the moderator clarifying what she heard being said "in addition to the funding, is that some of these organizations that try to act with neutrality maybe end up doing more harm because they are too afraid to help anyone who might have a whiff of being political or involved in politics and maybe pushing them to be a little bit more active in that space."

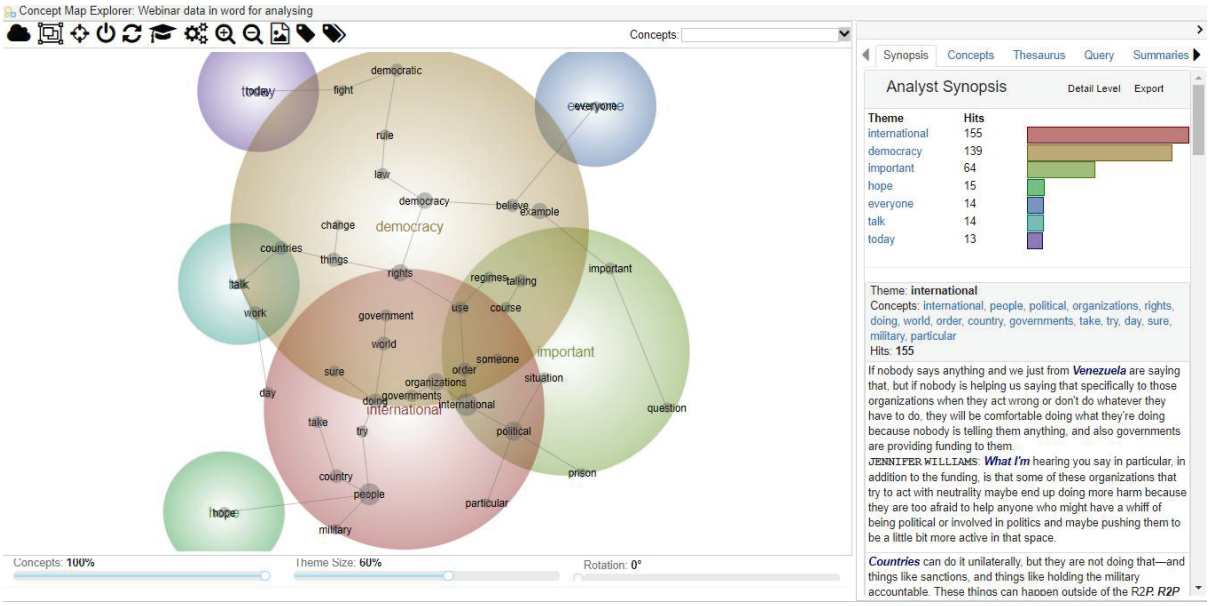



**Figure 4.35 Discussion noted that not speaking up means organisations will be comfortable doing what they are doing Carnegie Council Global Ethics Day Event: On the Frontlines of Democracy source Leximancer, Concepts map concepts 100% Themes 60%**

They spoke about political prisoners and about terrorism and using institutions of government to legitimise wrong, referring to the judicial system. It made me think about how this happens and why, both on the forefront of democracy for known challenges, also in 'democratic countries' where institutions were used to take every democratic value and right away happening all the time today and in Ireland up to the 1980s, Magdalen Laundries, Industrial schools, lives ruined, children's' identity taken, babies adopted without permission and birth certs falsified, girls identity taken given a number for the days they were in the laundries, often to the death. Democracy and upholding Democratic values, an ever-ongoing battle. It was noted that even in Western Democracies "it is not a perfect democracy either", but also on a positive note, "in the end democracy and democratic values will definitely win".

AI technologies align with Human Rights and Democracy both negatively when misused, examples noted in the Europol (2021) report549 and positively noted in the AI global portal of the Council of Europe, European Commission, European Union Agency for Fundamental Rights, the Inter-American Development Bank, the OECD, United Nations, UNESCO and the World Bank Group 550.

The Carnegie concepts map had highlighted the importance of speaking up when institutions support terrorism. The "Tech Point" was noted under the concept 'Important' as "really important".

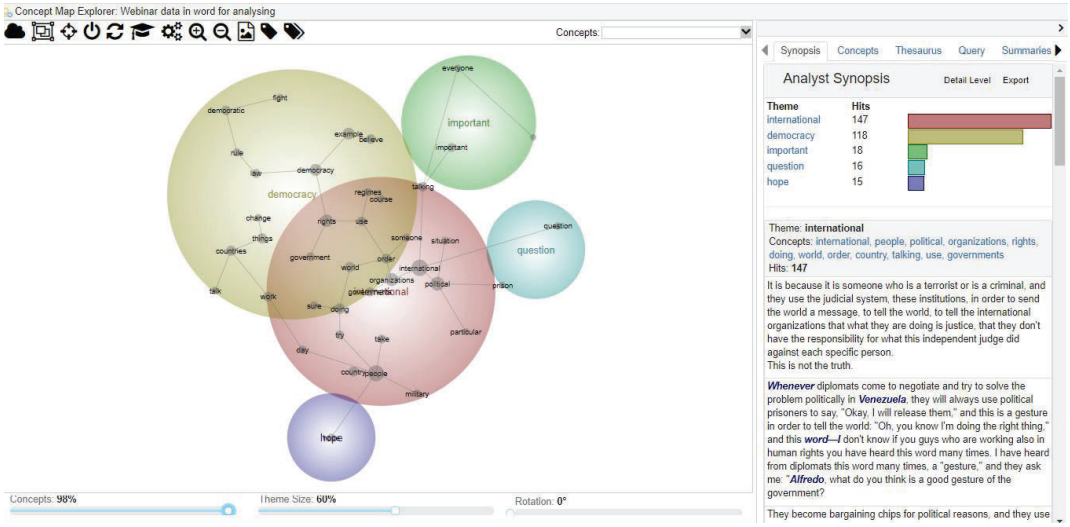



**Figure 4.36 International, Democracy, Important, Question, Hope. Carnegie Council Global Ethics Day Event: On the Frontlines of Democracy source Leximancer, Concepts map concepts 100% Themes 60%**

549 Europol., (2020), Malicious uses and abuses of Artificial Intelligence https://www.europol.europa.eu/publications-documents/malicious-uses-and-abuses-of-artificial-intelligence (accessed 13 November 2021)

550 European Union, Council of Europe, and 8 partners, (2021), Website 'GlobalPolicyAI' Key Focus areas, website published by the European Union, Council of Europe, Strasbourg, France, at

https://globalpolicy.ai/en/key-focus-areas/ (accessed 13 November 2021)

Is AI another, a different frontline of democracy?

I looked again at the AI scenario responses using Leximancer. The importance of the AI device coming from a non-biased source, and the need for exceptions for using AI where a citizen has a record of crime or terrorism resonated even more so in the context of webinar challenges.

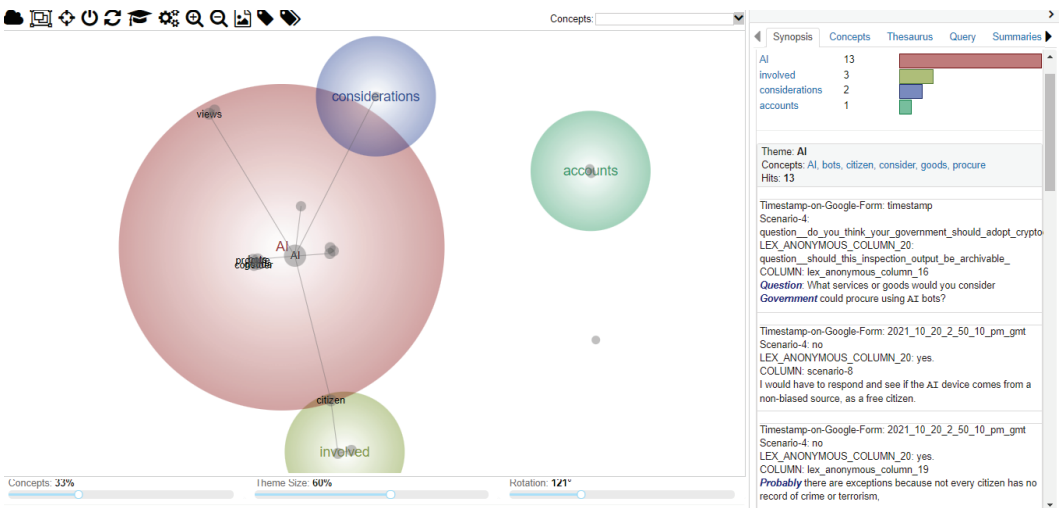



**Figure 4.37 AI Scenarios on Carnegie Council website responses, Concepts map concepts 33% Themes 60%**

I used Leximancer to highlight key concepts associated with the two AI scenarios on the Carnegie Council website responses, UN., (2017) ‘Putting Ethics to Work a Guide for UN Staff, and EU4AI., (2021) European Values for Ethics in Digital Technology. Teaching of Digital Ethics was noted as important and areas were outlined in that regard.

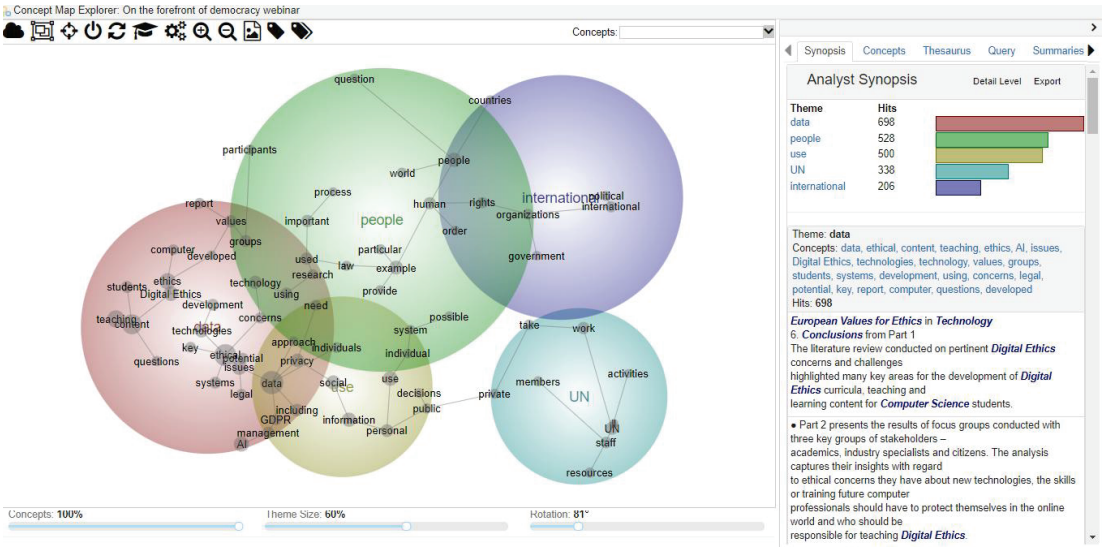



**Figure 4.38 AI Ethics scenarios on the Carnegie Council website, UN (2017) 'Putting Ethics to Work a Guide for UN Staff', European Values for Ethics in Digital Technology source Leximancer, Concepts map concepts 100% Themes 60%**

I asked myself, other than sending these findings to Carnegie Council which I had committed to do, and did on 14 November 2021, how could I effect change? Using the EU platform was a mode to achieve this, perhaps through the scenarios gaining interest with citizens, or in the absence of that, through a workshop/event or champion. I decided to see if I could achieve this through the EU forum as a citizen as citizen policy ideas are brought into the EU policy debate. I contacted the Department of Finance Press Office enquiring about the next New Technologies risk assessment consultation to get the commencement date for the next risk assessment consultation, which I did on 15 November 2021, as it wasn't recorded as done or upcoming on the government consultation site. It was confirmed there was no date yet for the next risk assessment.

I decided in the second data collection exercise to upload each scenario separately. I was required to shorten the stories to the 1,500 characters which I did, and I noted there

were not any similar scenarios. The site moderator approved upload of the data and then emailed approval to the first scenario to me, when I registered.

Having read the rules for engagement and confirmed my compliance with same, I submitted the 8 scenarios onto the Europa Website. The Frequently Asked Questions section highlights how ideas and events on this forum can potentially feed into the Institutions of Europe and thus into public policy. 551

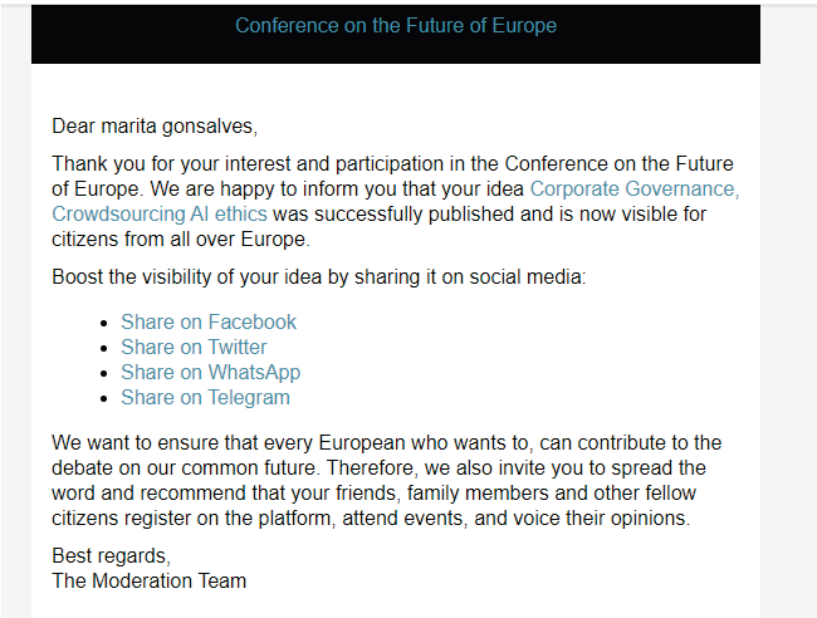
> "Input from citizens' online submissions and events will be analysed, using a combination of digital tools, data mining and human analysis. Reports will be prepared and will feed into the European Citizens' Panels and the Conference Plenary. These reports will also be available on the platform itself.
> The Executive Board will draw-up and publish the conclusions of the Conference Plenary and will present the final outcome of the Conference in a report to the President of the European Parliament, the President of the Council and the President of the European Commission. The three institutions will examine swiftly how to follow up effectively to this report, each within their own sphere of competences and in accordance with the Treaties.
> The Conference should reach conclusions by Spring 2022, so as to provide guidance to the three institutions on the future of Europe. It is therefore currently foreseen that the platform will be open until Spring 2022."

A marvelous opportunity to seek citizen engagement in the EU and to potentially influence future policy.

I uploaded the scenarios on 25 October 2021 under the section on 'Digital Transformation'. That evening the Website Moderators confirmed that the Ethics scenario

551 Council of Europe., European Parliament., European Commission., (2021), Frequently Asked Questions, responses to 'How will contributions be analysed? How long will the platform be open for submissions?' published by Council of Europe., Strasbourg, France, European Parliament., Strasbourg, France, and the European Commission, Belgium, Brussels, available at Frequently Asked Questions (FAQ) - Conference on the Future of Europe (europa.eu) (accessed 07 November 2021

for Crowdsourcing AI Ethics was appropriate. They have the right to check the uploads, and to remove if inappropriate or against EU values so I was delighted that it was accepted.


Conference on the Future of Europe

Dear marita gonsalves,

Thank you for your interest and participation in the Conference on the Future of Europe. We are happy to inform you that your idea Corporate Governance, Crowdsourcing AI ethics was successfully published and is now visible for citizens from all over Europe.

Boost the visibility of your idea by sharing it on social media:

- Share on Facebook
- Share on Twitter
- Share on WhatsApp
- Share on Telegram

We want to ensure that every European who wants to, can contribute to the debate on our common future. Therefore, we also invite you to spread the word and recommend that your friends, family members and other fellow citizens register on the platform, attend events, and voice their opinions.

Best regards,
The Moderation Team

**Figure 4.39 The Conference on the Future of Europe website moderation team confirmation of acceptance of Crowdsourcing AI ethics, emailed to Marita Gonsalves from the Conference on the Future of Europe moderation team, European Union, European Commission, Belgium, Brussels 25 October 2021.**

I had noted that most ideas on the site had very few responses or endorsement, possibly because there were so many ideas there. When there were no comments after a few days I thought about running an event or looking to see if there was an event I could liaise with. I had noted an upcoming event being hosted in Irish (an official EU language) through the Department of Foreign Affairs, in conjunction with the European Movement Ireland Agency, looking for Irish speakers for a panel. I registered for the event also presenting the AI ethics and policy scenarios in Irish by email, for their consideration for accepting to discuss when taking part in their event speaking Irish. **Appendix H** is my submission in Irish to participate detailing the scenarios and confirmation of acceptance to

participate. The scenarios can be seen in Irish or in any of the 24 official EU languages, with the website translation feature.

I attended the event on 04 November where it was confirmed that topics raised at the event and, also, ideas submitted in writing would form part of the report of the Department of Foreign Affairs, in conjunction with the European Movement Ireland Agency, being submitted and that I would be provided with a copy of this report in Irish and in English. If available in time it will be appended to the doctoral submission.

Comhdháil ar Thodhchaí na hEorpa - Gaeilge

15.00 – 17.00 (Dublin) | Déardaoin, 4 Samhain 2021 | Zoom

Tá lúcháir ar Gluaiseacht na hEorpa in Éirinn, i gcomhar leis an Roinn Gnóthaí Eachtracha, cuireadh a thabhairt duit páirt a ghlacadh i bplé ar líne trí Ghaeilge ar an gComhdháil ar Thodhchaí na hEorpa.

**Figure 4.40 The Government of Ireland's official launch of the Conference on the Future of Europe in Ireland, organised and hosted by the Department of Foreign Affairs in co-operation with European Movement Ireland, The Future of Europe European Movement Ireland Event 00 November 2021 AI scenarios (cásanna), part of the Conference of the Future of Europe in Ireland**

### 4.8.6 Leximancer speaks!

*Monitor the change.* What happens day by day when the change is introduced?

Carnegie Council had indicated they would put up a slide highlighting the AI scenarios findings as I had said I could provide them with the findings. I used Leximancer to analyse the findings and below are the two graphs I provided.

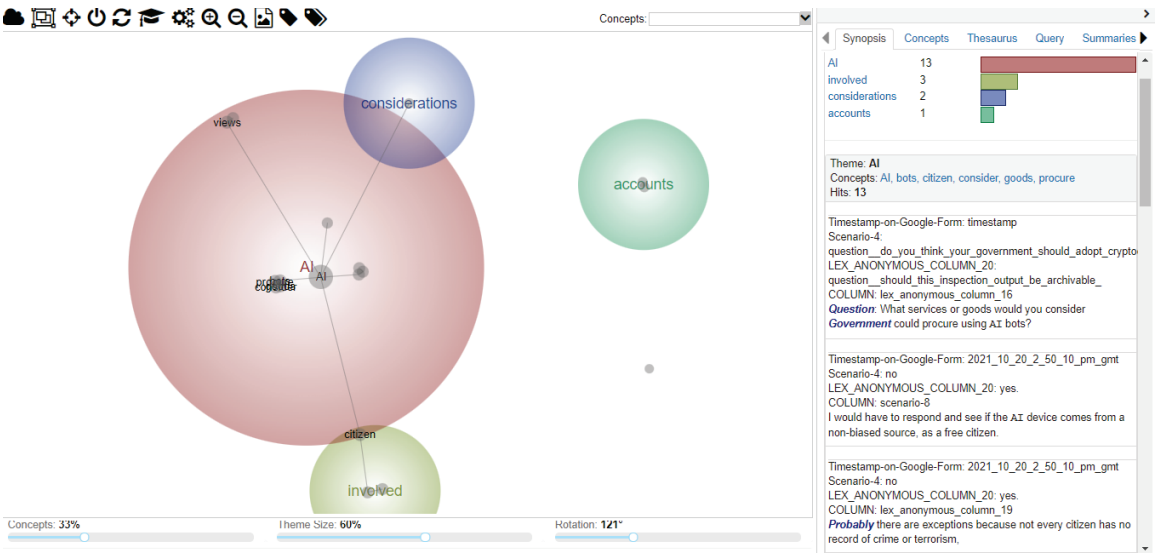



**Figure 4.41 Carnegie Council Global Ethics Day Event: AI Scenarios Responses, by Leximancer (November 2021)**

The second being a graph only, using Leximancer Concept Map Gaussian format. I was interested to note the disconnect between AI and a DAO, also AI and financial accounts.

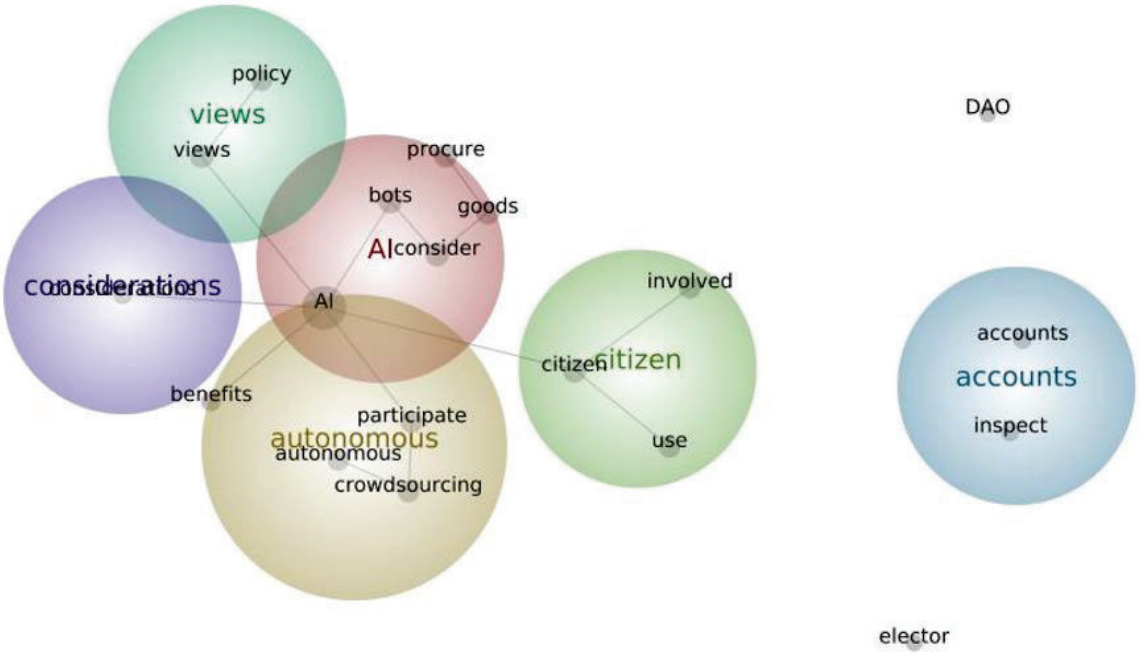



**Figure 4.42 Carnegie Council Global Ethics Day Event: AI Scenarios Responses, by Leximancer (November 2021)**

When preparing for the event, a former Data Protection Officer raised GDPR concerns relating to data use envisaged in some of the scenarios specifically in the Algorithm Charter, and the colleague who raised the issues had indicated to me that they would document and send. The information was provided and I noted the concerns expressed by the European Data Protection Board (EDPB) "connected vehicles are generating increasing amounts of data, most of which can be considered personal data' and the applicable law that resulted 'the connected vehicle and every device connected to it shall be considered as a "terminal equipment" (just like a computer, a smartphone or a smart television (TV)) and the provisions of art.5(3) ePrivacy directive must apply where relevant."552

552 European Data Protection Board., (EDPB)., (2020), Guidelines 1/20 on processing personal data in the context of connected vehicles and mobility related applications Version

I was due to attend a workshop being held by the European Movement Ireland regarding cybersecurity. I had raised a question in advance about Cyberbullying but with the above I decided to ask a question at that time of the EU panel regarding autonomous vehicles and smart cities and GDPR in the context of their stated observation "everything that is connected can be hacked."

**Figure 4.43 Question by Marita Gonsalves about technologies in Smart Cities, and GDPR also autonomous vehicles, at the webinar by European Movement Ireland., (2021), A Secure Future Cybersecurity and the EU available on YouTube https://www.youtube.com/watch?v=Vzge7u3Js_A**

1.0 Adopted on 28 January 2020. Pages 1pgh3 and 5 pgh13 Published by the EDPR, Brussels, Belgium, available at https://edpb.europa.eu/system/files/2021-03/edpb_guidelines_202001_connected_vehicles_v2.0_adopted_en.pdf (accessed 28 November 2021)

Their response surprised me. I'd asked 'how can we support policy makers and citizens in relation to technology in smart cities and GDPR, also, for autonomous vehicles? Brian Honan responded with a lot of good suggestions, that "the geeks alone can't fix this problem" and recommended that "cyber security, and Privacy" be raised with politicians as key issues that we as citizens value so that they do get the message" also "to keep contributing to European Movement sessions" because it was "a space where we could get advice from people like John" (Reynolds, Ministry of Foreign Affairs (MFA) Germany),"and Jo" (DeMeynck of the European Union Agency for Cybersecurity (ENISA)) "and other Institutions as to what we need to do at EU, national and individual level to improve cyber security". The ENISA and MFA representatives had looked surprised and had not answered. But I knew they would reflect on the question in time too. Words that resonated from all Panelists throughout the session included "Protect people in the physical and the virtual worlds", "trustworthy values" "cyber diplomacy" that "We rely on technologies from nations outside of the EU how can we trust that technology? "EU matters" "Global relationships matter" "everything that is connected can be hacked" "how do we ensure that emerging technologies, AI, quantum, are not misused by criminals" and that the "UN is the leader in this space" and are developing "a framework for building responsible state behaviour in cyber-space" but also that to address concerns there is a "new initiative on the Diplomacy Front, of 30 member states of likeminded states" which "can't work via the UN because the threat nations are there" highlighting the challenges, but also referencing "the EU speaks with one voice" and "the people element – the citizen space"

553 Citizen voice influencing public policy in many ways, also, through the webinars the reports of which, feed into the EU policy development space.

The impact of the scenarios will be monitored on an ongoing basis over time following the Event Report of the Department of Foreign Affairs and European Movement Ireland submission.

### 4.8.7 The Money Disconnect, AI, accounts, Decentralised Autonomous Companies, and cryptocurrency

*Analyse evaluative data about the change.* What is happening in this situation now – as understood by the various participants – as a result of the changes introduced? Using research methods what can we find out about it?

The two different data collection modes, Carnegie Council and Future of Europe raised interesting insights into technology awareness, AI, machine learning and also into the lack of understanding of the role of Financials evidenced in part, in the lack of engagement about cryptocurrencies.

But I also thought to try contacting the United Nations one final time, contacting directly, rather than by automated email. In Covid times it is possible that emails aren't being monitored in the same way. One scenario related to Sofia a UN post holder, also their work was important in the upcoming analysis of documents. I did this, on 13 November 2021, they responded on the same date to advise that they weren't accepting any papers

553 European Movement Ireland., (2021), A secure future, cybersecurity and the EU. Available on Youtube at https://www.youtube.com/watch?v=Vzge7u3Js_A (accessed 28 November 2021)

onto the site now. This route was closed. However, as the UN was now part of the Council of Europe 'one stop shop' and my findings would be there both through the Council of Europe site and the European Movement report (in Irish) I decided no further action was needed, that it was now time to focus on AI and financials and policy traits, and AI augmented financials.

### 4.8.8 IFAC on the horizon

> *Review the change and decide what to do next.* Was the change worthwhile? Are we going to continue it in future? What are we going to do next? Is the change sufficient?

Yes, both events were worthwhile, engagement through Ireland's Department of Foreign Affairs and the European Movement Ireland will impact on EU policy with gravitas in addition to individual citizen voice and the responses from Carnegie Council helped me rethink about citizen rights, AI, human in the loop and raise matters I had not yet seen in any documentation, reports, or other, except possibly in the FATF and EUROPOL reports. Linking these thoughts into financials and how, to me, every number tells a leadership story was something I was anxious to undertake. I also used Leximancer AI software to get AI Ethics Financial Policy Cross-Traits, the main expected one was Transparency. But I put this as a new cycle because it highlighted such interesting facts.

## Cycle 5 AI Enabled Themes and Concepts AI, Ethics, Financials, Policy

### 4.9.1 AI, Ethics, Financials, Public Policy, Themes and Concepts correlation

*Define the inquiry:* What is the issue of concern? What research question are we asking? Who will be involved? Where and when will it happen?

I had decided to use AI software called Leximancer to examine more closely key documents of global players, focusing on Financials and Audit and Policy to determine the correlation of Ethics, AI, Financial and Policy traits. I'd done this process using Literature Review documents manually and highlighted one common theme transparency. Leximancer a text mining tool for visualising themes and concepts. My original intent was to look at the IFAC, EU, IMF, OECD, UN and G20, however following further reflection on the existing literature I decided to add in INTOSAI, the World Bank, and the World Economic Forum given their global roles and influence.

I'd noted that many documents about AI had referenced policy traits and only one, Transparency had been identified in all documents. I wondered was there a correlation with Financial, Audit and Public Governance traits so I compared the OECD and HELG AI Principles, with the AI thoughts of the global financial and policy bodies in the Global Public Space. There should be Transparency. But what others?

| | | Vision, Mission, Values, Policy stance and AI stance. | | | | | |
|---|---|---|---|---|---|---|---|
| AI Ethics Financial Policy Traits Identified | AI ethics traits | IFAC | EU | IMF | OECD | UN | G20 |
| Social Construction of Reality, Sensemaking | | | | | | | |
| Social Responsibility | | | | | | | |
| Solidarity | y | | | | | | |
| Strategic Intervention | Motivation | | | | | | |
| Strategic Planning | Motivation | | | | | | |
| Sustainable Cities and Communities SDG 11 | | | | | | y | |
| Sustainable Development | | | | | y | y | |
| Sustainable economic growth | | | | y | | | |
| Technology neutrality | | | y | | | | |
| Transparency | y | y | y | | y | | y |
| Trustworthy | | | | | y | | |
| Unbiased datasets | | | y | | | | |
| Use-centric | | | y | | | | |
| User Data Rights | | | | | | | |
| Value Alignment | | | | | y | | |
| Well-being | | | | | y | y | |

**Table 4.11 AI Ethics Traits, literature review 306 documents and other media, to 30 June 2021, which included research documents and articles, had one common cross-trait, Transparency.**

I thought to examine the documents first under exploratory maps then see how the above concepts ranked. Transparency of the AI software Leximancer is important in terms of accuracy of findings. Leximancer uses machine learning, you can see everything in it, the concepts, thesaurus tab. It isn't black box. It can show full disclosure of all text. This is full transparency. It can be used as a tool for others to review documents and data and result in the same findings. This is something auditors are conscious of as for all audits undertaken the audit working papers, audit findings and conclusion should be possible to be recreated and the same conclusions reached by any other qualified auditor.

### 4.9.2 AI and a more critically aware policy space

*Describe the situation:* What are we required to do here? What are we trying to do here? What thinking underpins what we are doing?

AI Machine Learning systems are good if the underlying principles and data don't change much, which is true of financial data produced using the global accountancy standards and audited in accordance with global audit standards. The financial data is also used for statistical purposes and reconciled with the audited financial data. but the training knowledge won't degrade because the financial data is prepared on a consistent basis over the years. Financial data is truly a unique global language. So are the Ethics, Policies and Values of the global policy setters, the global accountancy profession, global financial policy making and lending entities. Showing how their values, codes of ethics and view on AI and related technologies compared with global AI principles, through the transparent lens of Leximancer will encourage policymakers to be more aware and if used themselves in public policy appraisal, could ensure public policy progresses into a more critically aware policy space.

I read the user manual watched the online tutorials and following initial exercises engaged a one-on-one tutorial because I was surprised at my findings, the disconnect between audit and AI. I also had found nothing to explain how keep and kill concepts were used without incurring bias. The time difference to attend a meeting at midday Brisbane time, 3am Ireland time, on a working day wasn't optimal so I had my map, and raised the questions below, which I sent as the basis for the tutorial.

> Question 1 I have set up some exploratory projects. How to set up a new project and documents consistently. I was shown how to do this and reminded, Projects and Data are stored on different hierarchies. A project is like a window/lens onto data you can create multiple different views of the dataset.
>
> Question 2 and 3: How can I remove contributors, endnotes, bibliography, if they aren't in every pdf/document I am looking at in a project? I was shown how to do this.

> Question 4: In the Concept Code Settings I asked to go through the Kill concepts to understand what the non-files mean and what it would mean if I removed one of those e.g. Section? United Nations? I saw in the tutorial that each filename is a document under Kill Concepts, and I would want to retain all of them under Mapping Concepts.

Response: Don't use Kill as this could wreck your model. Use Mapping Concepts. For example, if I removed a code 'people', under the available concepts setting I could keep the other codes that might appear in a paragraph. The Kill concept completely removes a paragraph. The kill concept says if a piece of text mentions the concept of people don't code that piece of text. I was advised it was useful for contaminated data, where data needs to be filtered out, survey data or social media data and trolls present, or email and email signatures can be filtered out as they would skew findings. I was advised it is used to remove pp, et al, other similar found in exploratory maps, as they mean bibliographies or references therefore the kill can be useful, but not really for PDF documents. I was advised my PDF documents were clean and not to use the 'kill, concept' function as it could wreck my model.

I uploaded the 36 pdf documents and generated the Thesaurus my Code Book was started. You can code in Leximancer using all concepts in the two columns on the right, that takes in headings. I didn't want all of them. The Mapping Concepts is the code book being used to code the data. There are 2 wildcards as default, "All Concepts" and "All Discovered Names". "All Concepts" picks up everything from the available concepts lists which I retained. "All Discovered Names" picks up headers, proper nouns, bibliographies. I excluded, 'Section', 'Article' and headings 'Ethics' 'Public' 'government'. I confirmed that was the correct approach, for example, Ethics with a Capital E is a header and ethics

as a concept is in the second list of Available Concepts, whereas ‘Section’ is a header in documents. I selected AI, Code, OECD, United Nations so they would be included in my model.

Questions 5 and 6. I'd noted with the themes number changes depending upon percentages for example audit and technology were not overlapping at the default of 30 or at 60 but overlapped at 87% when themes were dropped. How do you determine the optimal narrative (themes/concepts)? It was recommended that I make a change to the default theme size to 60, as the superior setting and that this setting was intended for the next release. I applied the suggested recommended default. I used 36 documents referenced in **Appendix D**.

My final question related to saving copies of the maps. I had seen on the YouTube video about saving images scalable vector graphs (SVG) and how you can amend on svg.

The tutor later clarified that:

> “The SVG image files (scalable vector graphics) are superior in several ways. You can edit everything about them using SVG editing software, and when you need a bitmap image file such as JPG for publishing, you can export an SVG at a higher resolution with no loss of quality. A couple common SVG editing packages are: Boxy (good and cheap), Adobe Illustrator, InkScape (free open source), but there are plenty of others.

I didn’t want to use SVG as editing the maps could add bias. I did not make any amendments to the names allocated by the AI software. I saved every concept map as a jpg. I used snips to show the results of Leximancer analysis. When running the actual data test on 28 October I used the above 36 documents. Later in my final graph for the Carnegie Council website further in this cycle, I amended one concept heading to remove a word where a theme and concept had the same name ‘considerations’ and I changed the theme name to ‘AI and Human’. This was done at their request.

### 4.9.3 'Plumbing the Depths'

> *Collect evaluative data and analyse it.* What is happening in this situation now as understood by the various participants? Using research methods, what can we find out about it?

I ran my maps comparing IFAC, INTOSAI, EU. IMF. OECD, UN, G20, World Economic Forum and World Bank. I downloaded the maps but also took snips of the data to show the concepts maps, map sizing as the recommended theme size was 60 and analysis. These 4 maps are set out below. I displayed the themes at the recommended settings in the first 3 maps and at 33% (the default setting) in the fourth map.

### 4.9.4 People, Organisations, and Technology interacting

> *Review the data and look for contradictions.* What contradictions are there between what we would like to happen and what seems to happen?

In order of importance in the governance documents, the themes are: Public, Interest, Audit, AI, and Governance.

- The theme of public shows the following concepts: public, service, conduct, ethical, servants, standards, officials, ethics, procedures, countries, measures, values, government, misconduct, civil, corruption, issues, following, OECD, law, report, official, general, sector, resources, training, administration, private.
- The theme of interest shows the following concepts: interest (e.g., conflict of interest), management, information, financial, including, include, specific, example, principles, staff, activities, work, required, legal, control, members.
- The theme of Audit shows the following concepts: audit, client, professional, team, individual, member, address, framework, relevant, services.

- The theme of AI shows the following concepts AI, use, systems, used, data, ensure, system, human.
- The theme Governance shows one concept, Governance.

The main theme ‘Public’ and the theme ‘Audit’ were at opposite ends of the map. Audit and AI did not overlap. The tutor had also run a map independently using the same data and reached the same conclusion although he was surprised. He’d observed that journey through ‘Interest’ to get from ‘Public’ to ‘Audit’ noting that macroscopic framework I wasn’t aware of could be seen at this level. He noted that an enquiring mind will enjoy unexpected connections. The theme of ‘Interest’, the second most prominent theme, concepts overlapping with ‘Public’ included ‘management’, and ‘control’. The theme ‘Interest’ had one concept overlapping with the theme ‘Audit’ which was ‘financial’.

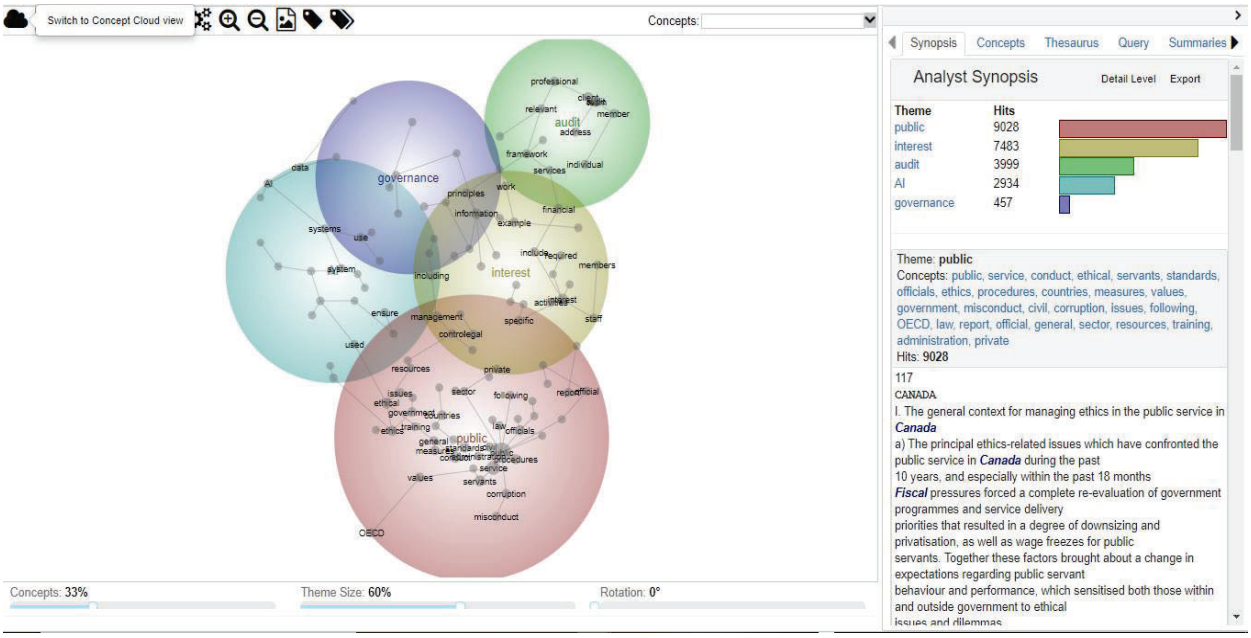



**Figure 4.44 The macroscopic framework, highlighted no overlap between the theme Public and the theme Audit, Leximancer Analysis 36documents Concepts 33% Theme Size 60%**

This was interesting. I was expecting a direct overlap between public and audit. That didn’t happen. Audit and Public were far apart. AI and Audit were far apart. How

would this impact for continuous accounting, public reporting, citizen involvement in AI public policy development? This 5 themes concept map reinforces the literature review general conclusions about AI and governance, and it highlighted new findings because there was a focus on accountancy, global financial governance and AI technologies and is like a "catch up needed" picture for a profession needing to be more on board about AI and related technologies.

I looked at the main theme Public. I'd noted Ethics, Ethical, Values, Procedures, Training, Corruption, Misconduct. The lack of overlap between the concept of Ethics and Governance was intriguing.

Looking at concepts this way facilitates seeing links through related words. I had to increase concepts to 65 to get any link to Governance. I had noted in Governance that the top names links included 'the role of stakeholders in corporate governance' also 'there is no single model of good corporate governance, however some common elements underlie good corporate governance'.

The strongest word association was 'training'. This was interesting because I make annual ethics declarations as an accountant, and as a public servant, but had noted in Ireland, training in ethics which includes scenarios where ethics might be tested isn't standard practice. My training in KPMG Public Sector in the UK included an assessment checklist for arrangements for the prevention, detection and investigation of Fraud and Corruption in the Audit Commission audit manual Fraud and Corruption (1994), contextualised in the Code of Audit Practice for Local Authorities and the National Health Service in England and Wales. It provided examples of existing income and expenditure frauds to watch out for and had one module which focused on corruption, to assist with

external audit of public sector. 554 This manual was formative in my early post qualification years. Transparency International (2017) stated, “the auditing profession is particularly vulnerable to such corruption challenges due to the nature of the relationship that auditors maintain with their clients, which can lead to conflicts of interest, and undermine their independence, and impartiality, in auditing their clients’ accounts.” 555

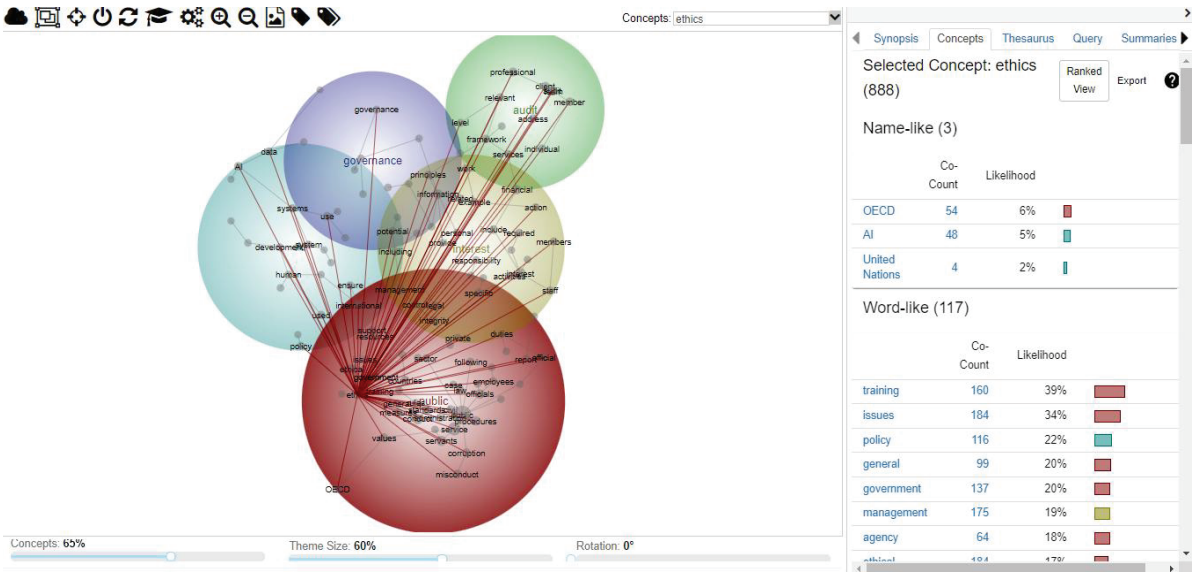



**Figure 4.45 Ethics weak link with Governance framework, Leximancer Analysis 36 documents Concepts 65% Theme Size 60%**

I next looked at the Theme AI. The Theme AI overlaps with Governance under concepts process, risk, and use. I then focused on the underlying concept AI and the word association links with other concepts.

554 Audit Commission UK., (1994) *The audit of fraud and corruption* published by the Audit Commission, London, UK. Hard copy only. No ISBN.

555 Transparency International (2017) The role of external auditing in fraud and corruption Page 1. Published by Transparency International, available at TI Template (transparency.org) (accessed 04 December 2021.

Looking at the AI concept, the lowest word association for the concept AI was 'servant' referenced ethical procurement. Procurement is a fundamental part of government goods and service provision. I noted with surprise that the concept 'AI' does not link to the concept 'corruption' in the documents used. I thought this strange as AI is often quoted as being used in the prevention and detection of fraud. Ethics training teaches about corruption in real life through scenarios. The lack of word association with the concept corruption, highlighted for me the ongoing rapid developments of AI. Chowdhury, M., (2021) noted that AI anti-corruption technology has the capacity to "uncover patterns in datasets that are too vast for people to handle" that the AI "discover(s) components of interest", for example.556

Highlighting 'audit' shows the quantitative relationship of audit. There are 1,043 places where audit appears. Systems appears on the list only in 21 locations. The documents making that link are from the IFAC and OECD only and reference accounting records, financial statements, and the nature of IT systems. There is association between the concepts of audit and corruption, although it is noted that the word associations relate to one OECD document.

The concept of Audit is strongly associated with almost all AI concepts, with one exception, the concept, United Nations.

556 Chowdhury, Madhuryja (2021) *Artificial Intelligence: The Next Generation Anti-Corruption Technology* Pgh 6 Published by Chowdhury, Madhuryja, Analyticsinsight.net, Stravium Intelligence LLP, San Jose California USA, Telegana and Maherashtra, India, available at https://www.analyticsinsight.net/artificial-intelligence-the-next-generation-anti-corruption-technology/ (accessed 31 October 2021)

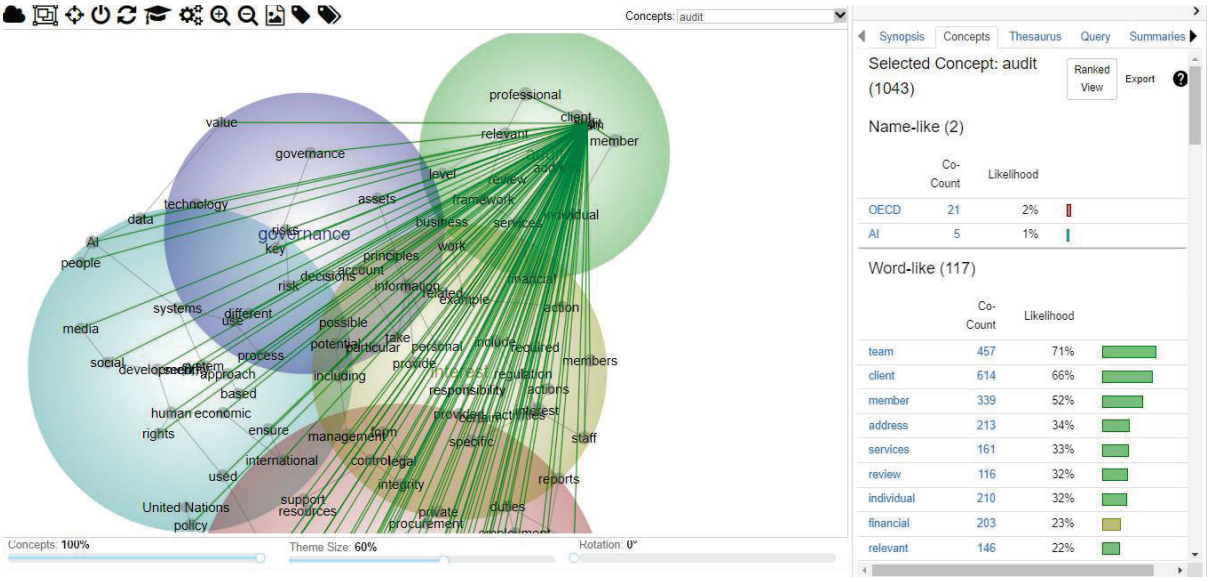



**Figure 4.46 The Concept Audit is word associated with almost every AI concept except the concept United Nations, Leximancer Analysis 36documents Concepts 100% Theme Size 60%**

I had noted that one concept overall was ‘Business’ between Audit, Governance and Interest. It made me reflect on the global bodies IFAC, OECD and UN. and perhaps need for greater discourse between all in the public sector space.

I queried why audit at one end and public at the other end as these are key global governance documents. Is there a lack of interest by the public in audit? I couldn’t imagine why this was happening as this is citizen funds, taxes raising, and funding spent on public policy. There is a right for citizens in local government public sector in Ireland and the UK to look at the books and records. In my years as a public auditor, I recalled that right was only invoked once when I was auditor. If that right was available in commercial accounts and you could copy relevant books and records it would be overrun. This picture tells the reality of public audit public interest and governance the way it appears to be.

I decided to see what themes were noted at 33%, the Leximancer default setting for Themes. Public remains the highest Theme, I’d noted the lack of any overlap between the

OECD and all other Themes, but that a concept linked to Ethical. All concepts are linked but perhaps a hint that greater connection is needed between the global Financial and Audit bodies, and OECD? OECD on Public Service conduct – developed through role play?

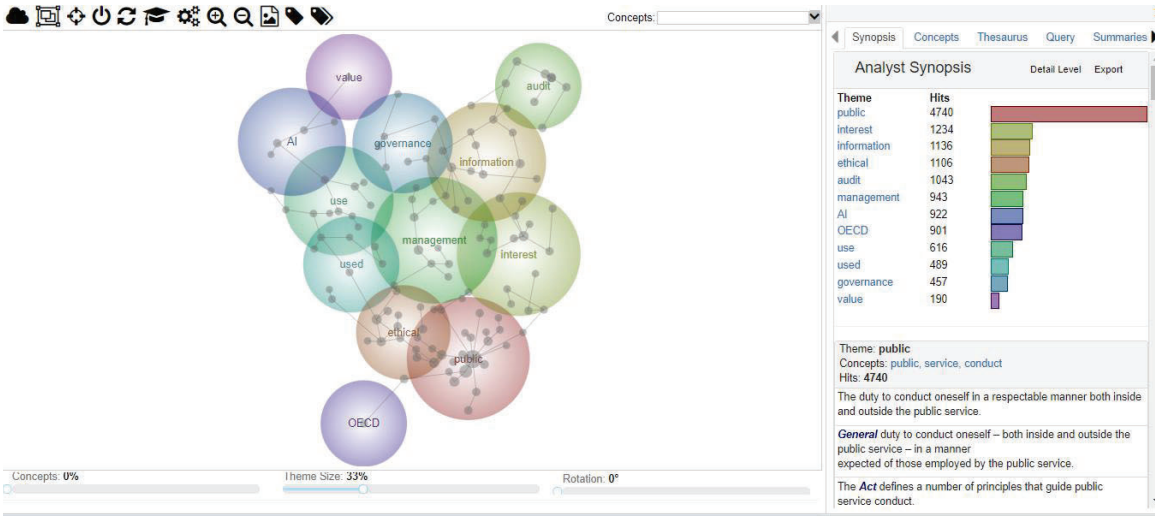



**Figure 4.47 The Theme OECD doesn't overlap with any other Theme but links into Ethical, Leximancer Analysis 36documents Concepts 0% Theme Size 33%, the Leximancer Theme default setting.**

I set Themes to 100% knowing this wasn't the optimal setting, seeking the top three themes, Public, Audit and AI, and detailed word associations.

The words resonated "The problem is that the norms by which we are measured, evaluated, and treated are often not subject to public discussion and negotiation. They are invisible to the individuals being watched, evaluated, and treated." I looked at the other themes wording, Audit included 'Internal Audit' and "Refinement of audit and evaluation methodology." AI wording included "data ethics", "including data management and practices", "AI Ethics including ethical concerns" "when building AI systems", "automated decision making and AI policy", "ethics for pervasive computing including topics such as surveillance, privacy and smart technologies", "social media ethics including

topics such as balancing free speech and access to accurate information" and "the relationship between Digital Ethics, digital regulations and digital" also "governance with a specific focus on the GDPR legislation".

AI references also included "algorithmic decision-making including the fairness, accountability, and transparency of those automated decisions," "intelligence for robotics or autonomous vehicles", "AI and the future of work and governance", and "intelligent technologies in healthcare and medicine" and that "Importantly, it is not only about hardware and software, but it also concerns, whole techno-social systems, how people and organisations and society and technology interact." This thinking is in my AI governance model

### 4.9.5 Introducing change, adding Transparency as a Concept

> *Tackle a contradiction by introducing change.* By reflecting critically and creatively on the contradictions, what change can we introduce which we think is likely to be beneficial?

When I checked against the AI themes some word associations were noted, the word 'social', 289 hits, the word combination sustainable development 27 hits, and word economic 199 hits, Responsibility 361 hits. The word Technology was associated with 258 hits but none of them related to neutrality. The AI ethics traits, Solidarity and Transparency were not in evidence. Other words Strategic, Trustworthy, Unbiased Datasets, were also missing. Transparency was the surprising missing word as it had appeared across all Vision, Mission and Policy and AI stances in the Literature Review. I had excluded headings under concept seeds, word references including the Fiscal Transparency Code headings were excluded from the word association. Was this impacting the data? I was

following the recommended route. Did it mean that the concepts underpinning Transparency were clearly enough described not to need to specifically reference the word?

| AI themes, Literature Review Chapter 2 manual | Identified in the Financial and Governance Documents, the words or Combined Words |
|---|---|
| Social Construction of Reality, Sensemaking | Social 289<br>Construction of Reality 0 Sensemaking 0 |
| Social Responsibility | Social 289 Responsibility 361 “Social Responsibility” 512 of 645<br>Check the words in detail in the logs. |
| Solidarity | Solidarity 0 |
| Strategic Intervention | Strategic 0 Intervention 0 Strategic Intervention 0 |
| Strategic Planning | Strategic 0 Planning 0 Strategic Planning 0 0 |
| Sustainable Cities and Communities SDG11 | Sustainable 0 Cities 0 Communities 0 “Sustainable Cities and Communities” 0<br>BUT development<br>sustainable development 378 |
| Sustainable Economic Growth | Sustainable 0 Economic 199<br>Growth 0”<br>Sustainable Economic Growth” 0 |
| Techn<br>ology Neutrality | Technology 258 Neutrality 0 Neutral 0 Technology Neutrality 258 but is it unrelated to neutrality |
| Transparency | Transparency 0 Transparent 0 |
| Trustworthy | Trustworthy 0 Trust 0 |
| Unbiased Datasets | Unbiased 0 Datasets o Unbiased Datasets 0 Bias 0 |
| Use-centric | Use 512 of 616 centric 0 Use-centric 516 hits Use-centric 0 user-centric 0 |
| User data rights | User 0 data 512 of 617 rights 358<br>Data Rights = 27 |
| Value Alignment | Value 190 Alignment 0<br>Value Alignment 190 |
| Well-being | Well-being 0 |

**Table 4.12 Transparency didn’t emerge as a concept in the AI Principles, Financial or Accountancy documents. AI themes, Literature Review Chapter 2 manual compared with AI Ethics Traits Identified**

Transparency didn’t emerge as a concept in the AI Principles, Financial or Accountancy documents. I then decided add Transparency as a concept and to rerun the maps biasing the data to see what impact it had. It wasn’t high on the correlation list. 216 hits.

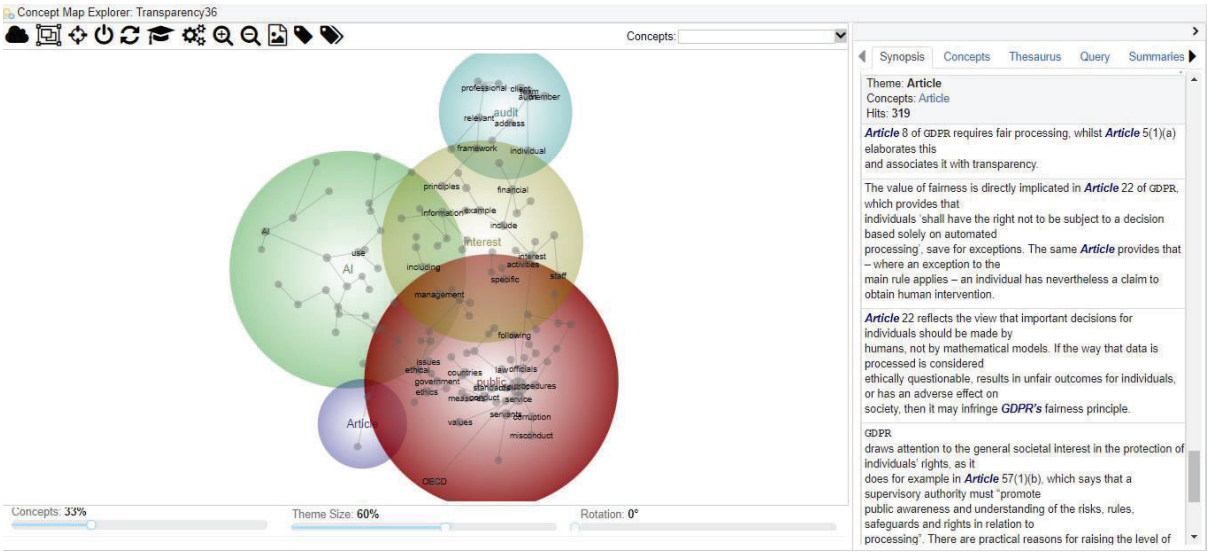



**Figure 4.48 The AI Ethics Traits of Solidarity and Transparency are missing Leximancer Analysis 36documents Concepts 0% Theme Size 33%, the Leximancer Theme default setting.**

Manually adding the concept "Transparency" resulted in 216 hits from many documents including 1. /Data the 40 docs/G20 OECD Principles of Corporate Governance adhered to by IMF.pdf 1_857 V. Disclosure and transparency. 2. /Data the 40 docs/EU European-Values-for-Ethics-in-Digital-Technology.pdf 1_705 Article 8 of GDPR requires fair processing, whilst Article 5(1)(a) elaborates this and associates it with transparency.

> "216. /Data the 40 docs/OECD Report Trust in Government Ethics measure in OECD countries.pdf 1_3198 b) Recent measures to improve ethical conduct in the public service The following measures have been taken regarding public servants who move temporarily or permanently to the private sector: Under Section 72 of the Act of 11 January 1984 containing provisions on the central government public service and the equivalent sections for the two other levels of the public services, and Section 87 of the Act of 29 January 1993, as amended, on corruption prevention and transparency of economic transactions and public procedures, public servants in the three levels of public service who leave the service permanently or request a leave of absence are. prohibited from exercising a professional activity in the private sector or the competitive public sector that is incompatible with their previous functions in the administration; this legislation also establishes an "ethics commission" in each of the three levels of public service."

GDPR is an EU regulation. Making this intervention was intended to confirm or expand the Governance Model. It will expand the model to reference GDPR and in a global context, Privacy.

### 4.9.6 Digital Co-Workers but Solidarity as a concept is still missing

*Monitor the change.* What happens day by day when the change is introduced?

As noted above, the GDPR is an EU regulation. Making this intervention was intended to confirm or expand the Governance Model. But what about the AI ethics concept solidarity noted in the Literature Review? The concepts noted referenced 'Economic' and 'Sustainable Development'. There is no word association with Solidarity, which highlighted the importance of workers voices. Citizens, Staff and Digital Co-workers would now be included in my model.

I researched at the newly formed "AI One Step Shop" portal, launched on the Council of Europe Site. And there it was. A faint theme.

The Council of Europe, (2021), launched a portal with 8 bodies "On 14 September 2021, eight international organisations joined forces to launch a new portal promoting global co-operation on artificial intelligence (AI). The portal is a one-stop shop for data, research findings and good practices in AI policy." The Council of Europe partners are the European Commission, European Union Agency for Fundamental Rights, the Inter-American Development Bank, the OECD, United Nations, UNESCO and the World Bank

Group. This portal is a one-stop shop for data, research findings and good practices on AI policy.557.

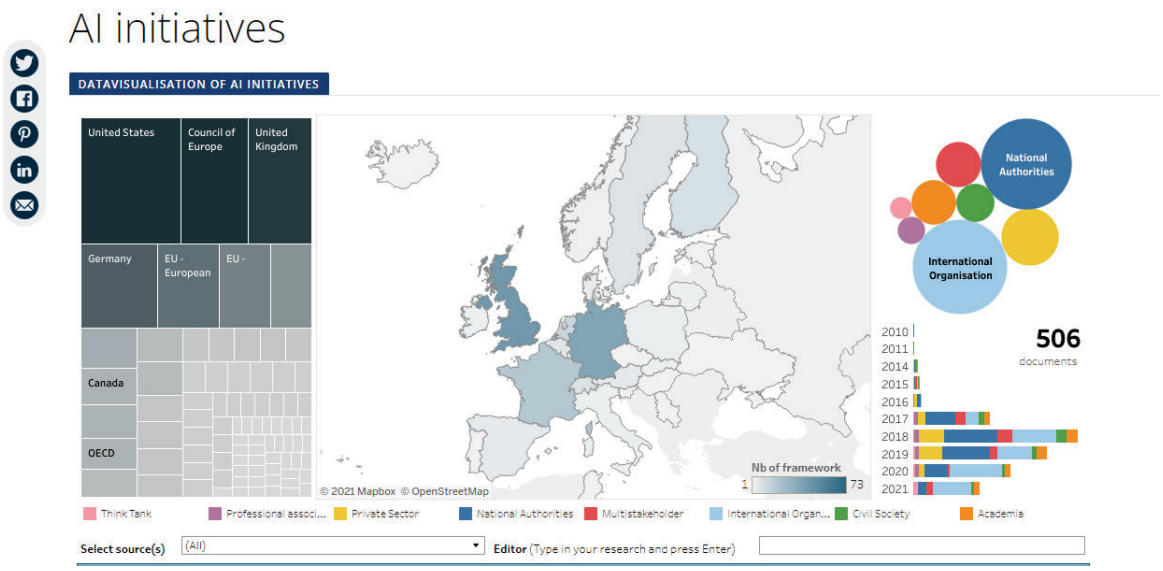



**Figure 4.49 The Council of Europe AI Initiatives Published by the European Union, Council of Europe Strasbourg, France https://www.coe.int/en/web/artificial-intelligence/national-initiatives at 13 November 2021 (accessed 13 November 2021)**

The Council of Europe AI Initiatives database has over 500 submissions from a variety of backgrounds was analysed into significant AI themes which included the cross AI and Financials traits noted in the Literature Review, of Transparency and Solidarity. Although they didn't feature as highly as other concepts frequency recorded.

The scenarios where the trait of Solidarity impacts AI, could be developed through role play?

557 European Union, Council of Europe., (2021), A new portal to promote global cooperation launched with 8 international organisations. Paragraph 1 Published by the European Union, Council of Europe, Strasbourg France, https://www.coe.int/en/web/artificial-intelligence/-/artificial-intelligence-a-new-portal-to-promote-global-cooperation-launched-with-8-international-organisations (accessed 13 November 2021)

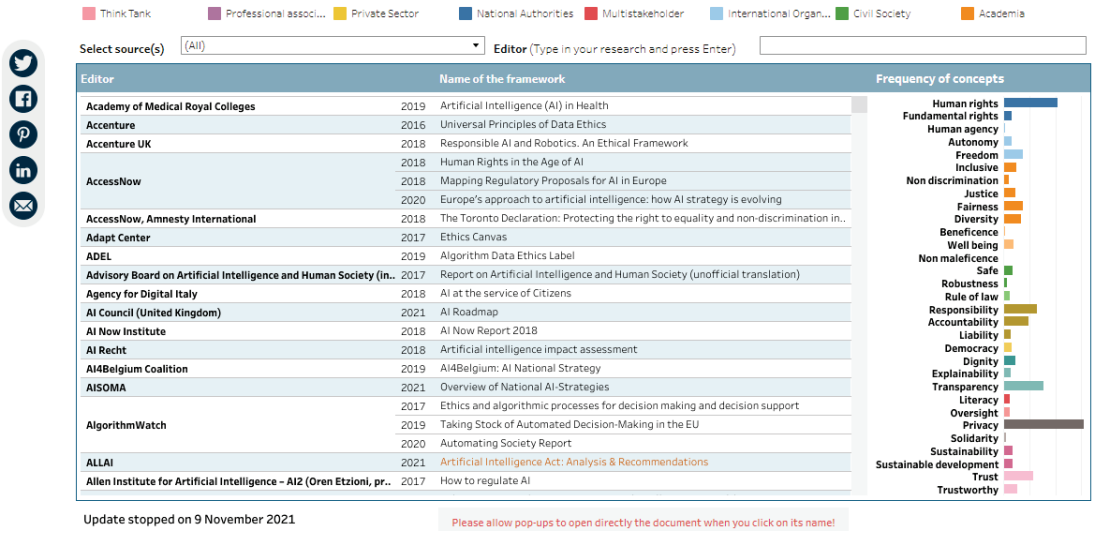



**Table 4.13 The Council of Europe Database of 506 AI Initiatives and Concepts Frequency included Transparency and Solidarity, Published by the European Union, Council of Europe Strasbourg, France available at** https://www.coe.int/en/web/artificial-intelligence/national-initiatives **(accessed 13 November 2021)**

This database is accessible as open data. I noted no submission by the IFAC, IMF, INTOSAI. There was no submission by the World Bank even though they are a partner of the portal. Although I noted Europol has a submission, I didn't see a submission by the EU Financial Action Task Force. There is scope for further inclusion in this database as the portal encourages referencing new documents from all to join in the debate and influence AI global policy and regulation.

### 4.9.7 Pioneers, the tech questions is important

> *Analyse evaluative data about the change.* What is happening in this situation now – as understood by the various participants – as a result of the changes introduced? Using research methods what can we find out about it?

This cycle was intended to confirm correlation of AI, ethics, Financial and Policy traits with a view to expanding the AI Governance Model. I would incorporate the reflections and key themes and concepts highlighted by Leximancer AI software in my governance model also the AI ethics trait of Solidarity, and the cross-documents concept "Transparency".

On 24 November 2021 Carnegie Council asked me to remove the duplication of 'considerations' if possible. I amended the theme name to the 2 concepts 'Human and Ethics from 'Considerations'. Carnegie Council also asked for a caption, and two lines about the maps which I provided below.

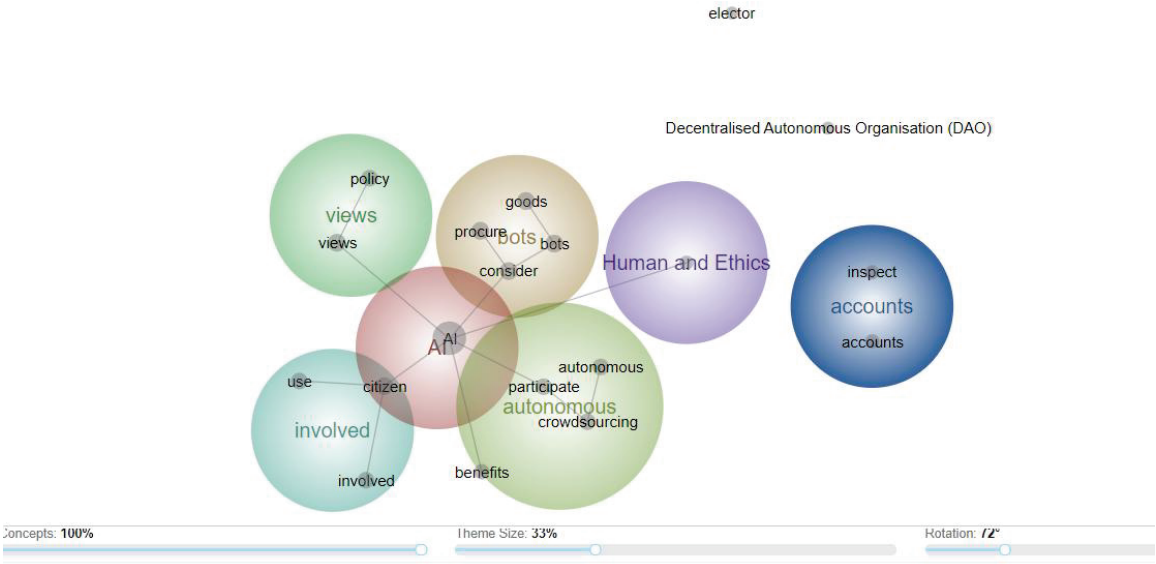



**Figure 4.50 AI at another forefront of Democracy. Money matters. Always. Carnegie Council Global Ethics Day Event: AI Scenarios Responses, Leximancer Analysis, (25 November 2021)**

AI ethics scenarios clearly linked AI with bots, crowdsourcing autonomous vehicles ethics, involvement in policy, citizens views matter. But AI wasn't associated with accounts or scrutiny of accounts, or AI decentralised autonomous organisations and the role of the citizen as elector is disassociated from scrutiny of accounts, which is a very important role in holding elected representatives to account in their stewardship of public funds. But where was the money? Where was the AI voice in Financials? I had seen AI referenced in the context of good work being done in relation to AML/CFT and countering fraud. But there are so many other wonderful AI opportunities, all of which would support public policy development and implementation.

I last analysed the AI Scenarios responses, received on the Carnegie Council Global Ethics Day 2021 citizen survey, with a UN ethics guide for staff 'Putting Ethics to Work' and a report by the EU, "European values for ethics in digital technology."

The concept map words highlighted when I re-ran the map on 09 March 2022, "Data and Data Management. Data ethics is a relatively new branch of ethics that studies (and evaluates) moral problems related to data management (including generation, recording, curation, processing, dissemination, sharing and use), algorithms (including those using AI and machine learning)" resonated.

While not at the Leximancer recommended settings for concepts and themes, I thought the words important enough to use the map because moral problems in relation to data management ethics were emphasized.

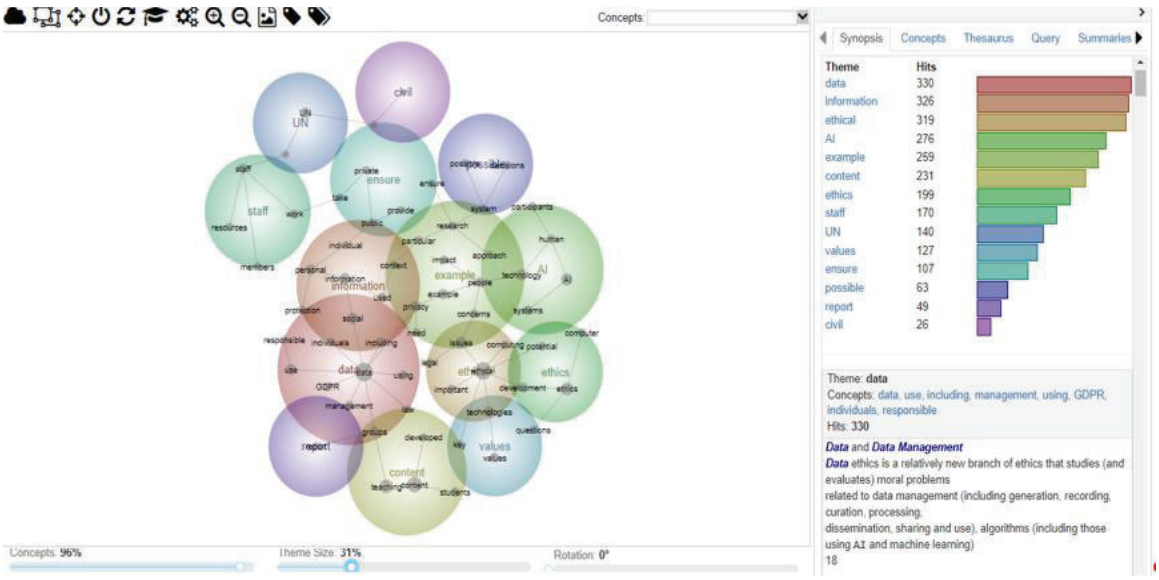



**Figure 4.51 Where is the Money? Data and Data Management Algorithms, and moral problems, Leximancer analysis of Responses to AI Scenarios Carnegie Council Global Ethics Day 2021, Putting Ethics to Work a guide for UN staff (2017) and European values for ethics in digital technology #Ethics4EU, (2020)**

Data management includes financial data. The Tech Question is important (Carnegie Council Webinar 2021). As the FATF (2019) video states, #FollowtheMoney.

### 4.9.8 Where is the money?

> *Review the change and decide what to do next.* Was the change worthwhile? Are we going to continue it in future? What are we going to do next? Is the change sufficient?

The Leximancer exercise was very worthwhile as it highlighted some unexpected connections and some unexpected disconnections. I reflected the findings in the model I was drafting, which was focusing on Ethics and Citizen Input, also Solidarity, in the policy process, financials, and algorithmic government today. But it wasn't time yet to complete my model as I needed to also include financials.

I had noted the World Bank (2021) referenced harnessing AI to a new Policy and Regularity Framework.558 There were other AI frameworks too, but this was the world bank financial framework. Regularity is a key concept for all accountants and auditors and for all involved in public financial management. Sustainable Development concept 378 associations meant this framework was of interested and I explored this as part of my model, as multi-stakeholder engagement was identified, also the concept of Catch-up vs Leapfrog, something which was raised in relation to Accountancy, in my exploratory model.

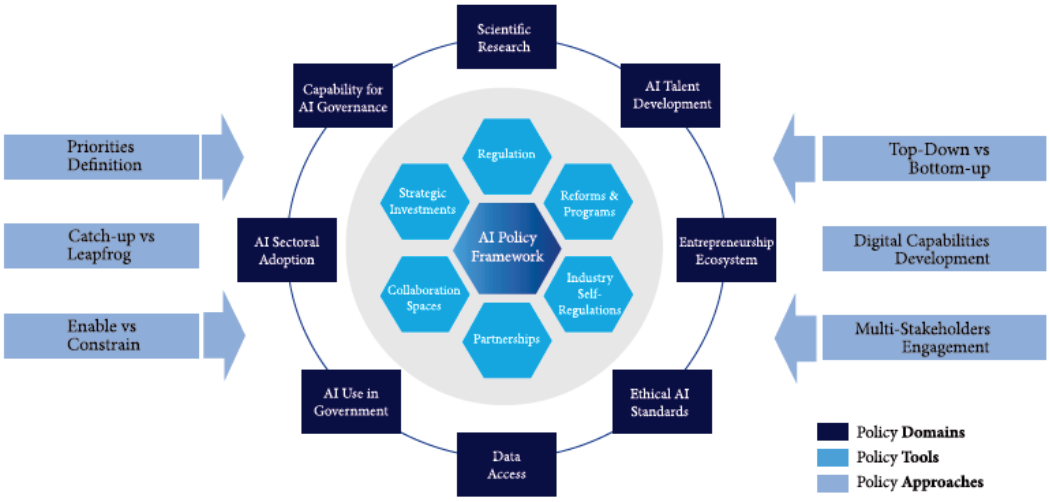



**Figure 4.52 World Bank (2021) Harnessing Artificial Intelligence for Development. A New Policy and Regulatory Framework. (Page 2) by the World Bank**

But where was the money?

558 World Bank (2021) Harnessing Artificial Intelligence for Development of a new Policy and Regulatory Framework, Page 2 Published by World Bank, Washington DC, USA available at https://documents1.worldbank.org/curated/en/326191582688955286/pdf/Harnessing-Artificial-Intelligence-for-Development-A-New-Policy-and-Regulatory-Framework.pdf (accessed 31 October 2021)

I had noted that ethics, citizen voice, financials themselves, the budgets and continuous accounting and reporting elements were disconnected. And in an earlier cycle that there was very limited ability to undertake VFM financial appraisal public policy? I used Cycle 6 to consider these elements. Every number tells a leadership story. The final piece of the model.

## 4.10 Cycle 6: AI Budget for Government? Every number tells a story in a global AI augmented language

### 4.10.1 Choppy Waters. Define the inquiry: AI Budget Predictions, AI Financial Reporting, AI anti-Fraud/Corruption/Anti-money laundering (AML)/Countering the Financing of Terrorism (CFT) reporting, a paper paradigm in a digital world

*Define the inquiry:* What is the issue of concern? What research question are we asking? Who will be involved? Where and when will it happen?

I considered three key areas within public sector, Budgets/Forecasts; Financial Statements and Financial Reporting; and Fraud, Corruption, AML/CFT. "Money makes the world go around," a song from yesteryear in the musical Cabaret 1966 by Warner Brothers Entertainment.[559] The sentiments as true today as it was then.

#### 4.10.1.1Budgets/Forecasts

Leal, T., Pérez, J. J., Tujula, M., Vidal, J-P., (2007) state "the accountability of governments for the use of public funds in democracies is at the root of budgetary procedures and has ultimately led to the development of fiscal forecasting techniques". They state government targets have "been criticised for being systematically biased as a result of setting unrealistic, politically motivated targets sometimes leading to claims that

[559] Warner Brothers Entertainment., (1966), "Money" Musical Number in 'Cabaret' by Warner Brothers Entertainment available on available on Youtube https://www.youtube.com/watch?v=4JDWJzKYfdc (accessed 26 February 2022)
Note: On the Youtube site it says musical extravaganza set in a Berlin cabaret in 1931, where the rising tide of Nazism has direct effects on the lives of several individuals.
It also says "At Warner Bros. Entertainment, we believe in the power of story. From classics to contemporary masterpieces, explore and watch a library full of extraordinary, stirring, and provocative entertainment that goes beyond the big screen."

public finance projections in Europe should be produced by independent authorities, to avoid politically-motivated forecast biases" that "while the literature on forecast performance broadly supported the view that fiscal forecasts prepared by governments tend to be biased, and inaccurate that the causes for forecast errors have been insufficiently covered in literature."

> "Overall, the main message that emerges from the review and the dilemmas faced by fiscal forecasters is that, despite the importance of having reliable quantitative predictions, good fiscal forecasts are not necessarily the best in the statistical sense, but they must allow for a thorough understanding of budgetary developments and a sound basis for fiscal policy making.
> Fiscal forecasting is more an art than a science, but an art that should be to the benefit of informed fiscal policy discussions and sound fiscal policy decisions, rather than an exercise that can be assessed only on the basis of a set of forecast performance indicators.560

The OpenFisca (2022) platform identifies open-source products "including "Evaluate the impact of public policy. Compare the legislation now to what it could be and has "Tax and Benefit system models which exist for a number of countries. [561]

Ennadif G., (2020) reports that the French Government "free and open source OpenFisca *calculation engine enables collaboration and transparent modelling of socio-fiscal systems" allowing "users to compute a large number of social charges, social*

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560 Leal, Teresa., Pérez, Javier J., Tujula, Mika., Vidal, Jean-Pierre., of the European Central Bank., (2007) Fiscal forecasting lessons from the literature and challenges. Page 5. Published by Leal, T., Pérez, J. J., Tujula, M., Vidal, J-P., the European Central Bank, Frankfurt-am-Main, Germany, at https://www.ecb.europa.eu/pub/pdf/scpwps/ecbwp843.pdf?baa4ffab2201f0baea2169b78a3bd8a6 (accessed 17 September 2021)

561 OpenFisca, (2022) OpenFisca Turn Law into Software. Website Editor Agence Nationale de la Cohésion des Territoires, Paris France, Hosting Provider GitHub Inc, San Francisco, California, USA available at https://openfisca.org/en/countries/ (accessed on 27 February 2022)

*benefits and taxes, and to simulate the impact of reforms on these sums" "*Users can outline their tax and benefit systems, provide inputs (e.g. income) and ask for a calculation output." **562**. The OpenFisca (2022), platform reported that the models are now used in 11 countries around the world, on 27 February 20*22.* 563[564]

The Observatory of Public Sector Innovation (OPSI)., (2018) website references the case study of New Zealand, notes the "frameworks for creating and managing the rule of government, as reflected in policies, legislation and regulation, are still based on a paper paradigm in a digital world and that this creates poor service experiences, that often the intent of a policy is not achieved"[565]. The New Zealand Government piloted an initiative called Rules as Code (RaC) and they used 'a multi-stakeholder approach to co-design authoritative and reusable sources of machine consumable legislation and rules in conjunction with the transparently equivalent human-readable, ,this 'enables software,

562 Ennadif G., (2020) OpenFisca, The French Government's Open-Source Platform that turns law into software through socio-fiscal modelling available at: https://joinup.ec.europa.eu/collection/open-source-observatory-osor/news/socio-fiscal-modelling (accessed 17 September 2021)

563 OpenFisca., (2022), *Platform Available County Packages*. Website Editor Agence Nationale de la Cohésion des Territoires, Paris France, Hosting Provider GitHub Inc, San Francisco, California, USA available at https://openfisca.org/en/countries/ ((accessed 27 February 2022) (also accessed 17 September 2021 and one more country added)) and

564 OpenFisca., (2011), Open Source Tools Platform, Website Editor Agence Nationale de la Cohésion des Territoires, Paris France, Hosting Provider GitHub Inc, San Francisco, California, USA available at: https://fr.openfisca.org/ (accessed 27 February 2022)

565 OPSI., OECD, (2018), Better Rules: Better Outcomes. Paragraph 1 Published by OPSI, OECD, Paris, France, at https://oecd-opsi.org/innovations/better-rules-better-outcomes/ (Accessed 27 February 2022) [Case Study New Zealand 2018.]

artificial intelligence, blockchain and IoT applications to be primary consumers of government rules, 'legislation as code'[566] and they note

Mohun, James., and Roberts, Alex., (2020), noted RaC initiatives in France OpenFisca, and LexImpact, which allows ex ante policy modelling. 567 OpenFisca website (2022) highlights LexImpact which is used to "simulate the impact of tax reforms on citizens" that "LexImpact aims at helping administrators and deputies to simulate the impact of reforms on the government budget before its vote.568 The French Government Digital services incubator of the Interministerial Digital Department (DINUM), (2011) reported LexImpact helps "parliamentarians to estimate the impact of their amendments before voting." "LexImpact comes in two interfaces, "OPEN LexImpact, making it possible to estimate the **impacts of a reform on typical tax households**." And:

> LexImpact POP allowing, in addition to the functionalities already present on the general public version, to estimate **the macro impacts of a reform on the population and the revenues of the State**. LexImpact POP is, to date, only accessible to parliamentarians and their collaborators, as well as to administrators involved in the making of the law.

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566 OPSI, OECD, (2019), Embracing Innovation in Government, Global Trends 2019. Pages 104-113 Published February 2019 by OPSI, OECD, Paris, France, available at: https://trends.oecd-opsi.org/embracing-innovation-in-government-global-trends-2019.pdf (Accessed 27 February 2022) [Section Trend 3 Machine Readable World Case Study Better Rules New Zealand]

567 Mohun, James., and Roberts, Alex., (2020), Cracking the Code, Rulemaking for Humans and Machines. Table 1 page 8. Published by Mohun, James., and Roberts, Alex., (2020), OECD, OPSI https://oecd-opsi.org/wp-content/uploads/2020/10/Rules-as-Code_Highlights_Final_HighRes.pdf

568 OpenFisca, (2011) LexImpact Website Editor Agence Nationale de la Cohésion des Territoires, Paris France, Hosting Provider GitHub Inc, San Francisco, California, USA https://fr.openfisca.org/showcase/leximpact/ (accessed 17 September 2021)

The website notes "the service is based on OpenFisca free software created in 2011 which transforms legislative code into computer code." That the "LexImpact code is free" "and can therefore be checked and improved by everyone." [569]

Global digital solutions. And in the EU a focus on interoperability too. The European Commission collaborative platform JoinUp (2011) states "Interoperable Europe is the initiative of the European Commission for a reinforced interoperability policy in the public sector. It is committed to introducing a new cooperative Interoperability policy for Europe that will transform the public administrations and help them in their digital transformation" and, references the European Blockchain Services Infrastructure (EBSI) as one of the existing solutions.[570] The Interoperability Solutions for European Public Administrations (ISA2)., (2020) website references interoperable solutions "You work in a public administration. A cross-border public service is about to be developed. You would like to keep costs down and reuse interoperability solutions that have already been developed." for example, European Interoperability Reference Architecture (EIRA) or Cartography tool (CarTool), states the solutions listed on it "are already operational and can be reused free of charge.[571] Blockchain for Public Sector Grants Management?

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569 Government of France, Digital services incubator of the Interministerial Digital Department, (DINUM), (2011), Startups LexImpact. Published by DINUM, Government of France, Paris, France, at: https://beta.gouv.fr/startups/leximpact.html (Accessed 27 February 2022) (Last updated 23 February 2022) [Translated on their website into English]

570 European Commission., JoinUp., (2011), Interoperable Europe Website. Paragraph 1, Published by the European Commission, JoinUp. Collaborative Platform, Brussels, Belgium. Available at https://joinup.ec.europa.eu/collection/interoperable-europe/interoperable-europe (accessed 27 February 2022) (last updated February 2022)

571 European Commission, Interoperability Solutions for European Public Administrations (ISA2)., (2020), ISA2, Interoperability Solutions for European Public Administrations, Businesses and Citizens, webpage of solutions and interactive map, available at, https://ec.europa.eu/isa2/solutions_en (accessed 27 February 2022)

The IMF monitors the global economy. "A core responsibility of the IMF is to oversee the international monetary system and monitor the economic and financial policies of its 190 member countries, an activity known as surveillance." Their Video on how the IMF "spots global risks and help to address them" is informative.

Each year the IMF visits almost every one of its 190 member countries, evaluating economic policies and outlook. The IMF engage with "government and central bank officials and others in discussions about risks to domestic and global stability as well as policies and reforms to address those risks". They produce country reports which have recommendations to address issues noted, and they also "monitor regional and global economic trends and analyzes the impact that member country policies may have on neighboring countries and the global economy" all reports are available on their website. 572

Global reports include the World Economic Outlook, Global Financial Stability Report, Fiscal Monitor and the Global Policy Agenda report. The Global Policy Agenda 2021 report key priorities include "calibrate policies to limit scarring, support the recovery, and counter growing divergences within and between countries; and accelerate the transformation of the global economy to achieve a more inclusive, greener, and digital recovery". 573

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572 IMF., (2021), IMF Surveillance Factsheet Paragraph 1 and, 'The IMF Spots Global Risks and Helps to Address Them' Video on the Factsheet. Published by the IMF, Washington DC, USA available at https://www.imf.org/en/About/Factsheets/IMF-Surveillance (accessed 16 November 2021) Article dated 01 March 2021

573 IMF., (2021), Global Policy Agenda report webpage https://www.imf.org/en/Publications/Policy-Papers/Issues/2021/10/12/The-Managing-

The IMF (2021) Country report for Ireland, for example, shows fiscal projections, refences Brexit, the pandemic, the climate change agenda, and states "the current fiscal space and Next Generation EU recovery funds should be used to accelerate Ireland's green and digital transformation".

**Table 2. Ireland: Statement of Operations of the General Government, 2017–26**
**(percent of GDP, unless otherwise indicated)**

| | | | | | Projections 1/ | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 |
| **Revenue** | **26.0** | **25.8** | **25.1** | **23.4** | **22.1** | **22.2** | **22.2** | **22.3** | **22.3** | **21.9** |
| Taxes | 18.5 | 18.5 | 18.2 | 16.9 | 16.4 | 16.7 | 16.7 | 16.8 | 16.8 | 16.5 |
| Personal income tax | 7.1 | 7.0 | 6.9 | 6.2 | 6.3 | 6.3 | 6.3 | 6.4 | 6.4 | 6.5 |
| Corporate income tax | 2.8 | 3.2 | 3.1 | 3.2 | 3.0 | 3.0 | 3.0 | 2.9 | 2.9 | 2.5 |
| VAT | 4.3 | 4.3 | 4.3 | 3.5 | 3.6 | 3.8 | 3.8 | 3.8 | 3.8 | 3.8 |
| Excises | 1.5 | 1.4 | 1.4 | 1.3 | 1.3 | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 |
| Other taxes | 2.9 | 2.6 | 2.4 | 2.8 | 2.2 | 2.2 | 2.2 | 2.3 | 2.3 | 2.3 |
| Social contributions | 4.6 | 4.6 | 4.5 | 4.3 | 4.1 | 3.9 | 4.0 | 4.0 | 4.0 | 4.1 |
| Other revenue | 2.8 | 2.7 | 2.5 | 2.1 | 1.7 | 1.6 | 1.6 | 1.5 | 1.5 | 1.4 |
| **Expenditure** | **26.3** | **25.7** | **24.6** | **28.4** | **27.7** | **25.1** | **23.4** | **23.1** | **22.7** | **22.2** |
| Expense | 24.5 | 23.6 | 22.2 | 25.8 | 25.1 | 22.4 | 20.7 | 20.4 | 20.0 | 19.5 |
| Compensation of employees | 7.0 | 6.7 | 6.5 | 6.8 | 6.7 | 6.7 | 6.5 | 6.4 | 6.3 | 6.2 |
| Use of goods and services | 3.5 | 3.4 | 3.5 | 4.0 | 4.0 | 3.5 | 3.4 | 3.4 | 3.3 | 3.2 |
| Interest | 2.0 | 1.6 | 1.3 | 1.0 | 0.9 | 1.0 | 0.9 | 0.9 | 0.9 | 0.8 |
| Subsidies | 0.6 | 0.6 | 0.5 | 1.5 | 1.6 | 0.9 | 0.5 | 0.5 | 0.5 | 0.5 |
| Social benefits | 9.8 | 9.3 | 8.9 | 10.6 | 10.3 | 8.8 | 7.9 | 7.7 | 7.6 | 7.4 |
| Other expense | 1.6 | 1.9 | 1.6 | 1.8 | 1.6 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 |
| Net acquisition of nonfinancial assets | 1.8 | 2.1 | 2.3 | 2.7 | 2.6 | 2.7 | 2.7 | 2.7 | 2.7 | 2.7 |
| **Net lending(+)/borrowing(-) (overall balance)** | **-0.3** | **0.1** | **0.5** | **-5.0** | **-5.6** | **-2.8** | **-1.2** | **-0.8** | **-0.4** | **-0.3** |
| Net financial transactions | -0.4 | 0.2 | 0.5 | -4.9 | -5.9 | -3.7 | -1.5 | -1.3 | -0.9 | 1.1 |
| Net acquisition of financial assets | -0.7 | 5.3 | 0.0 | -1.1 | -0.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Net incurrence of liabilities | -0.3 | 5.2 | -0.5 | 3.9 | 5.6 | 3.7 | 1.5 | 1.3 | 0.9 | -1.1 |
| **Memorandum items:** | | | | | | | | | | |
| Structural balance | -0.8 | -0.2 | 0.3 | -1.6 | -2.8 | -2.6 | -1.1 | -0.8 | -0.4 | -0.3 |
| Structural primary balance | 1.2 | 1.4 | 1.6 | -0.6 | -1.9 | -1.7 | -0.3 | 0.1 | 0.5 | 0.5 |
| Gross public debt 2/ | 67.0 | 63.0 | 57.4 | 59.5 | 63.0 | 62.9 | 60.9 | 59.0 | 56.9 | 53.1 |
| in percent of GNI* | 108.1 | 103.6 | 95.6 | 106.4 | ... | ... | ... | ... | ... | ... |
| in percent of revenue | 257.7 | 244.1 | 228.8 | 254.4 | 284.6 | 282.7 | 273.9 | 264.8 | 255.0 | 242.1 |
| Net public debt 3/ | 59.8 | 55.8 | 49.3 | 51.1 | 55.1 | 55.5 | 54.0 | 52.5 | 50.7 | 47.2 |
| Interest (in percent of revenue) | 7.6 | 6.3 | 5.0 | 4.3 | 4.3 | 4.3 | 3.9 | 4.1 | 3.9 | 3.5 |
| Currency and deposits | 5.7 | 6.6 | 6.7 | 4.7 | 4.0 | 3.7 | 3.5 | 3.3 | 3.2 | 3.0 |
| GDP at current market prices (in billions of euros) | 300.4 | 327.0 | 356.1 | 366.5 | 391.1 | 417.8 | 441.9 | 463.5 | 485.8 | 509.3 |

Sources: DoF; Eurostat; and IMF staff estimates and projections.
1/ The decline in most items as percent of GDP is caused by the greater divergence between GDP and tax base as well as GNI* in 2020, e.g. VAT is projected to return to 10 percent of private consumption.
2/ Includes the accumulation of a Rainy Day Fund of €0.5 billion starting in 2019.
3/ Gross debt minus financial assets corresponding to debt instruments (currency and deposits, debt securities, and loans).

**Table 4.14 IMF Country Report Ireland, Fiscal Forecasts (2021) Ireland report published by the IMF Washington DC, USA page 30**

Director-s-Global-Policy-Agenda-Annual-Meetings-2021-489894 (accessed 16 November 2021)

The report refers to the "need to further improve the quality of public spending, including, by strengthening adherence to budgeted targets and enhancing the implementation of infrastructure projects and maintenance of public assets." Also noting the improvement since the 2017 PEFA findings. Ireland's authorities agreed in the main but also:

> "Stressed the need to further improve the efficiency of public spending building on the progress that is being made in the context of the ongoing Spending Review and Performance Budgeting processes, and the establishment of the National Investment Office" and "that more revenue will need to be raised in the medium term to help finance additional social and capital spending." 574

Downes, R., and Nico, S., (2016), reference Ireland's Public Spending Code and noted that, "unlike several other OECD countries, the constitution of Ireland does not contain a special chapter dealing with public financial management (PFM), nor is there an "organic budget law" setting out budgetary rules and procedures in a comprehensive manner.575. This holds true today. Could this emerging technology LexImpact be adapted? Or was there an alternative route? There are tools for Fiscal Forecasting using government financial data used to model and stress test fiscal assumptions.

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574 IMF Country Report (2021) Country Report Ireland. Pages 11, 13, 17, footnote 9, Table 2 on Page 30. Published by the IMF, Washington DC, USA available at https://www.imf.org/en/Countries/IRL (accessed 16 November 2021) (Published June 2021)

575 Downes, Ronnie., and Nico, Scherie., OECD., (2016), Review of Budget Oversight by Parliament Ireland Pages 71 and 76 Published by Downes, Ronnie., and Nico, Scherie., OECD, Paris, France. Journal on Budgeting, Vol. 16/1. at https://www.oecd.org/gov/budgeting/Review-of-budget-oversight-by-parliament-Ireland.pdf (accessed 17 September 2021) also available at DOI: http://dx.doi.org/10.1787/budget-16-5jlv0r0g8zd7 (accessed 27 February 2022)

The IMF have a forecasting tool 'The Public Debt Dynamics tool' which is used to project the stock of public debt over time periods from 2021 up to 2031 using financial data I had completed a course online in the IMF to understand this tool also in the context of Ireland's own Fiscal Forecasting tool Maq which is more restricted for use if modelling. The Irish Fiscal Advisory Council website states that "this Fiscal Space Calculator remains a 'beta' version. While significant efforts have been made to develop and check it, the Council intends to develop and refine it further over time." 576 Maq models Fiscal Space to 2025. The IMF projected revenues, expenditure, and net lending/borrowing and other reporting out to 2026 in the Ireland country report 2021 and could project up to 10 years ahead using their Public Debt Dynamics tool.

I also explored budgeting and forecasting for Government Department, Local Authority needs, as well as Country budgets and forecasts.

Marotta, G., and Cam-Duc, A., (2021), state there are less detailed use-cases in corporate finance where AI has changed and improved processes, also that research into this area is in its infancy, and identifies six functions for budgets, as a monitoring tool a benchmarking tool, a coordinating tool, a communication tool, for performance evaluation and as a roadmap for strategies. They stated

> "With reference to the new technological-based environment, further investigation of how new technologies can support budgetary effectiveness and managerial performance will be useful to generate. These studies may also give explanations, how new processes can be embedded into existing structures, and what risks and limitations may arise."

576 Irish Fiscal Advisory Council (2021), Fiscal Space Calculator 2. Published by the Irish Fiscal Advisory Council, Dublin, Ireland available at https://www.fiscalcouncil.ie/fiscal-space-calculator/ (accessed 23 November 2021)

And reference the need for new perspectives on budgeting processes with AI, for human behaviour and organisations, "the future budgeting discipline depends also on new perspectives and complementary theories to capture the great complexity of human behavior and organizational success." 577

Unger, G., and Rodt, T., Boston Consulting Group., and Daimler Mobility., (2019), state that Daimler Mobility's calculation engine, Merlin' incorporates a multitude of algorithms and decides on its own which to use—whether one algorithm or a combination of algorithms". It:

> "Applies machine learning to generate a fully data-driven, unbiased forecast that presents the best possible predictions. Whenever new monthly data is available, Merlin produces millions of forecasts for selected KPIs and automatically validates the forecasts by comparing them with past performance. On the basis of this comparison, it selects the best algorithm or combination of algorithms for a particular KPI. 578

Song, C., (2018), stated that Uber transformed their financial forecasting with data science and machine learning, that AI driven forecasting platforms enables rolling

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577 Marotta, Gianfranco., and Cam-Duc, Au., (2019) Opportunities of AI in Budgeting Approaches Pages 4, 11, 12 and Figure 2. Published by Marotta, G. and Cam-Duc, A., Digital welt, Germany, original article was online at https://digitaleweltmagazin.de/en/fachbeitrag/opportunities-of-ai-in-budgeting-approaches/ (accessed 16 September 2021) article was redated on digitaleweltmagazin.de as 18 April 2021, in the name of Marotta, Gianfranco noting Cam-Duc, A as another author at the end. Article available at https://digitaleweltmagazin.de/fachbeitrag/opportunities-of-ai-in-budgeting-approaches/ (accessed 28 February 2022)

578 Unger, G. and Rodt, M. Boston Consulting Group and Daimler Mobility (2019). The Art of Forward-Looking Steering: The Power of Algorithmic Forecasting. Boston Consulting Group and Daimler Mobility. Page 9 Paragraph Algorithms and Data. Published by Unger, G. and Rodt, M. Boston Consulting Group., Boston, USA, and Daimler Mobility Stuttgart, Germany https://www.bcg.com/publications/2019/power-of-algorithmic-forecasting (accessed 17 September 2021).

forecasts, automation of their systems model refreshing, retraining and backtesting processes noting that stakeholders can do strategic planning on demand with newly collected data every month used to re-train their models, which incorporates new learnings into the next month's strategic planning that Uber has automated scenario planning, with built in user overrides.579 Imagine that functionality in government budgets? Xiao, S., He, H., Kodavanit, P., and Meno, E., of Uber, (2020), stated that by February 2020, Uber had on-boarded six forecast models that are used regularly for financial planning and budget management, noting that the new backtesting service has the potential to surface more insights from forecasts, which helps Uber operations teams improve the Uber experience for markets worldwide 580

Each year Ireland and other countries develop budgets on excel sheets, submit to the appropriate authorities, and agree and report bi-monthly. There are also multi-annual budgets for capital and current expenditure, and everything is reported using excel. Strategies in government can be longer-term such as the Ireland Project Ireland 2040 capital expenditure budget forecast. The EU forecasts their budget over a 10-year period. The 2021-2027 long term budget EUR 1.211 trillion is topped up by EUR 806.9 billion

579 Song, Chunyan., of UBER, (2018) *Transforming Financial Forecasting with Data Science and Machine Learning at Uber.* Pages 3, 4, and 8. Published by Song, Chunyan., Uber, San Francisco, California, USA, Available at https://eng.uber.com/transforming-financial-forecasting-machine-learning/ (accessed 16 September 2021)

580 Xian, Sam., He, Haoyu., Kodavanit, Pooja., Meno, Ethia., of Uber., (2020) Building a backtesting service to measure model performance at Uber scale. Pages 7 and 8, Paragraph 29 Driving Forward. Published by Xian, Sam., He, Haoyu., Kodavanit, Pooja., Meno, Ethia, of Uber, San Francisco, California, USA, Available at https://eng.uber.com/backtesting-at-scale/ (Accessed 17 September 2021)

through NextGenerationEU, a temporary instrument to power the recovery, the budget is sourced from all member states focusses on priorities including digitalisation and green deal.581 But, how are they prepared? Is AI part of the process? AI as noted earlier in this Chapter, "brings science to the Art of Policymaking".

Also, as noted in Cycle 1, Ireland's public sector has struggled to produce Financial Appraisal for Policy Modelling. This situation doesn't seem to have improved in that I could find almost no examples of Financial Appraisals and had noted the continuing difficulty in my own Department for colleagues doing same. In fact, I hadn't seen one example during the time I had worked in PSC governance mapping. I was still awaiting the DPER NIO updated financial appraisal guidelines. I attended a Public Sector conference

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581 European Commission., (2021), The EU 2021-2027 Long-Term Budget and NextGeneration. Published by the European Commission, Directorate-General for Budget, Belgium Brussels, EU, at https://op.europa.eu/en/publication-detail/-/publication/d3e77637-a963-11eb-9585-01aa75ed71a1/language-en (accessed 17 September 2021)

Note: The budget is available at: European Commission, Directorate-General for Budget, *The EU's 2021-2027 long-term budget and NextGenerationEU : facts and figures*, 2021, **https://data.europa.eu/doi/10.2761/91357**

Note: The webpage states: In 2020, the EU provided an unprecedented response to the coronavirus crisis that hit Europe and the world. At its heart is a stimulus package worth EUR 2.018 trillion in current prices (EUR 1.8 trillion in 2018 prices). It consists of the EU's long-term budget for 2021 to 2027 of EUR 1.211 trillion (EUR 1.074 trillion in 2018 prices), topped up by EUR 806.9 billion (EUR 750 billion in 2018 prices) through NextGenerationEU, a temporary instrument to power the recovery. The EU sets the limits of its spending in the multiannual financial framework , the EU's long-term budget for the next 7 years. In this way, the EU secures the resources for its political priorities, like digitalisation and green deal. The budget also ensures room for flexibility, thus enabling the EU to respond to unforeseen circumstances. The 2021–2027 long-term budget, or the multiannual financial framework (MFF) of EUR 1.211 trillion, will seek to support the recovery while investing in the EU's regions, farmers, companies, researchers, students, citizens in general as well as our neighbouring countries.

in November 2021 where Oracle had indicated that their systems for Public Sector entities were in the cloud, could close financial statements in one day so that policymakers could look to the future and adding value, and could run any form of budget or financial reports required at any time. I queried about whether long-term budgets could also be prepared using historical data and longer-term 10-year budgets, which I had indicated were already there in public sector, citing Project Ireland 2040 budget, and the speaker confirmed yes, using Monte Carlo analysis, and looking for anomalies in the data. I was interested. I thought to follow up as it was a possible route.

AI enabling continuous accounting and long-term budget forecasts appeared to be coming onto the horizon.

#### 4.10.1.2Financial Statements and Financial Reporting

The OECD., (2019), recommended "the Irish Government establish accrual financial statements compliant with international standards for its departments and offices" and also to "harmonise accounting standards used by entities within the general government sector", noting that

> *"...accrual data would be a "building block" for richer, more reliable fiscal information, which would, in turn, help formulate improved assumptions for fiscal forecasts and be better equipped to identify fiscal risks. Beyond the adoption of accrual accounting, this report proposes that the Irish Government considers modernising its financial reporting framework by preparing integrated reports for departments and offices and consolidated financial statements. Integrated accounts for departments and offices would provide an overview of each department's resources and spending alongside information on their strategy and performance. This would enhance and improve scrutiny and examination of departmental*

*performance by the Committee of Public Accounts and by the Oireachtas Sectoral Committee."582*

Department of Finance., Economics Division, (2021), stated "The accounting basis for each subsector is included in the headings. The final three columns sum amounts on different accounting bases. Although this is unconventional, the intention is to give an indication of the impact of the transactions of each subsector of general government" also stating that "some of the data in this table is provisional and based on the best estimates up to this point. The table will be updated each month and quarter when better data is available." "Other central government bodies are noted as comprising "extra-budgetary funds and non-market public corporations (non-commercial semi-State bodies)". The monthly report notes that the data are "collected in a survey by the statistics unit in the Department. The government bodies that are included in this survey are chosen based on a materiality threshold and in particular focusing on those entities that have incomes independent of the Exchequer." It clarifies it includes "actual monthly receipts and expenditure data for the Exchequer, Ireland Strategic Investment Fund, and the Social Insurance Fund" that "the local government data is available quarterly and before the end of the next quarter". 583

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582 OECD (2019), Financial Reporting in Ireland. Page3 Published by the OECD Delphine Moretti, (OECD) Scherie Nicol, (OECD Emeline Denis, (OECD) Tim Youngberry (OECD consultant) the OECD Public Governance Directorate, Paris, France at , https://www.oecd.org/gov/budgeting/Financial-reporting-in-Ireland-web.pdf (accessed 24 August 2021)

583 Department of Finance., Economics Division., (2021), Fiscal Data Monthly revenues and expenditures of all subsectors of general government for May 2021 at 29 June 2020 Page 3, 4and 6. Published by the Department of Finance, Dublin, Ireland 29th July 2021 at gov.ie - Monthly revenues and expenditures of all subsectors of general government for May 2021 (www.gov.ie) Published 30 June 2021 Last updated 30 June

Fiscal data – monthly revenues and expenditures of all subsectors of general government

**Table 1: monthly fiscal data for the central government and local government subsectors of general government (€m)**

| At end- May 2021 | ESA code | S.1311 Central government | | | | S.1313 Local gov't | S.13 General gov't | S.13 General gov't | S.13 General gov't |
|---|---|---|---|---|---|---|---|---|---|
| | | Exchequer | ISIF | CG bodies | SIF | | | | |
| | | A | B | C | D | E | F (= A to E) | G | H |
| accounting basis | | cash | mixed | mixed | cash | accrual | mixed | consolidated transactions | cons'd transactions excl. fin ops |
| **1 Total revenue / inflows** | | **30,002** | **43** | **6,444** | **6,684** | **4,039** | **47,212** | **38,013** | **33,316** |
| Direct taxes (taxes on income & wealth) | D.5 | 13,527 | - | 596 | - | - | 14,123 | 14,123 | 14,123 |
| Indirect taxes - VAT | D.2 | 6,978 | - | - | - | - | 6,978 | 6,978 | 6,978 |
| Other indirect taxes | D.2, D.9 | 3,174 | - | 524 | - | 655 | 4,353 | 4,353 | 4,353 |
| Social contributions | D.61 | - | - | - | 4,700 | - | 4,700 | 4,700 | 4,700 |
| Property income | D.4 | 413 | 27 | 36 | - | 13 | 489 | 489 | 489 |
| Other receipts | | 59 | 16 | 1,503 | 18 | 1,077 | 2,674 | 2,674 | 2,674 |
| Inflows from S.1311 (central gov't) | | 1,091 | 0 | 3,700 | 1,966 | 2,294 | 9,051 | - | - |
| Inflows from S.1311 (SIF) | | 73 | - | - | - | - | 73 | - | - |
| Inflows from S.1313 (local gov't) | | 58 | - | 17 | - | - | 75 | - | - |
| Inflows from operations in financial instruments | | 4,628 | 0 | 69 | 0 | 0 | 4,696 | 4,696 | - |
| *Of which consolidated with other government bodies* | | *0* | - | *0* | *0* | - | *0* | - | - |
| **2 Total expenditure / outflows** | | **36,041** | **15** | **6,434** | **7,135** | **4,679** | **54,303** | **45,095** | **41,294** |
| Compensation of employees | D.1 | 8,078 | 15 | 1,294 | - | 990 | 10,377 | 10,377 | 10,377 |
| Interest | D.41 | 2,979 | - | 12 | - | 17 | 3,007 | 3,007 | 3,007 |
| Social benefits | D.6 | 7,515 | - | 1,386 | 6,980 | 519 | 16,400 | 16,400 | 16,400 |
| Capital transfers (capital grants) | D.9 | - | - | 121 | - | 19 | 140 | 140 | 140 |
| Other expenditure | | 6,818 | 0 | 1,415 | 82 | 3,056 | 11,371 | 11,371 | 11,371 |
| Outflows to S.1311 (central gov't) | | 3,250 | 0 | 1,550 | 73 | 75 | 4,948 | - | - |
| Outflows to S.1311 (SIF) | | 1,966 | - | - | - | - | 1,966 | - | - |
| Outflows to S.1313 (local gov't) | | 1,678 | - | 615 | - | - | 2,294 | - | - |
| Outflows from operations in financial instruments | | 3,756 | - | 41 | 0 | 4 | 3,801 | 3,801 | - |
| *Of which consolidated with other government bodies* | | *0* | - | *0* | *0* | - | *0* | - | - |
| **A. Overall balance (1-2)** | | **-6,039** | **28** | **10** | **-450** | **-640** | **-7,091** | **-7,083** | **-7,978** |

**Table 4.15 Department of Finance., Economics Division., (2021), Monthly fiscal data for the central government and local government subsectors of general government (€m\) showing accounting bases, cash, mixed, and accrual**

In respect of the accounting bases, it states "the accounting basis for each subsector is included in the headings. The final three columns sum amounts on different accounting bases. Although this is unconventional, the intention is to give an indication of the impact of the transactions of each subsector of general government".584

2021. Also available at https://www.gov.ie/en/collection/d5cef7-monthly-revenues-and-expenditures-of-all-subsectors-of-general-gover/ (Both accessed 4 December 2021).

584 Department of Finance., Economics Division., (2021), Fiscal Data Monthly revenues and expenditures of all subsectors of general government for June 2021 Pages 3

DPER, Hearne, E., (2019) acknowledges PSC and cost overruns, budgeting and comparing performance with actual, also noting this is a global problem and not restricted to the public sector. The presentation cites Flyvbjerg, B., (2014) schedule of cost overruns.585 and acknowledging the legacy of underperformance in project costs management and the need to improve. 586

4, and 6 Published 29 July 2021 by the Department of Finance, Dublin, Ireland available at https://www.gov.ie/en/collection/d5cef7-monthly-revenues-and-expenditures-of-all-subsectors-of-general-gover/ (accessed 24 August 2021) (Last updated 29 July 2021)

585 Flyvbjerg, Bent., (2014), What you should know about megaprojects and why: an overview. Page 10. Published by Flyvbjerg, Bent., University of Oxford, Said Business School; IT University of Copenhagen; St Anne's College, University of Oxford, Project Management Journal, vol. 45, no. 2, pp. 6-19 DOI: 10.1002/pmj.21409 also on https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2424835 (accessed 28 February 2022) Posted: 14 Apr 2014. Last revised: 6 Jan 2016.

Note: In his 2014 article it is stated alongside that table "Combine the large cost overruns and benefit shortfalls with the fact that business cases, cost–benefit analyses, and social and environmental impact assessments are typically at the core of planning and decision making for megaprojects and we see that such analyses can generally not be trusted"

586 Government of Ireland, Project Ireland 2040, DPER, Hearne, Ed., (2019), Update on the Public Spending Code, published to the Project Managers Network Ireland. Slide 6 (references Flyvbjerg, Bent., (2014)), Published by the Government of Ireland, Project Ireland 2040, DPER, Hearne, E., available at https://www.ops.gov.ie/app/uploads/2019/12/Ed-Hearne-PMLAS-Public-Spending-Code.pdf (accessed 21 November 2021) Presented at the Public Sector Project Managers Network 03 September 2019.

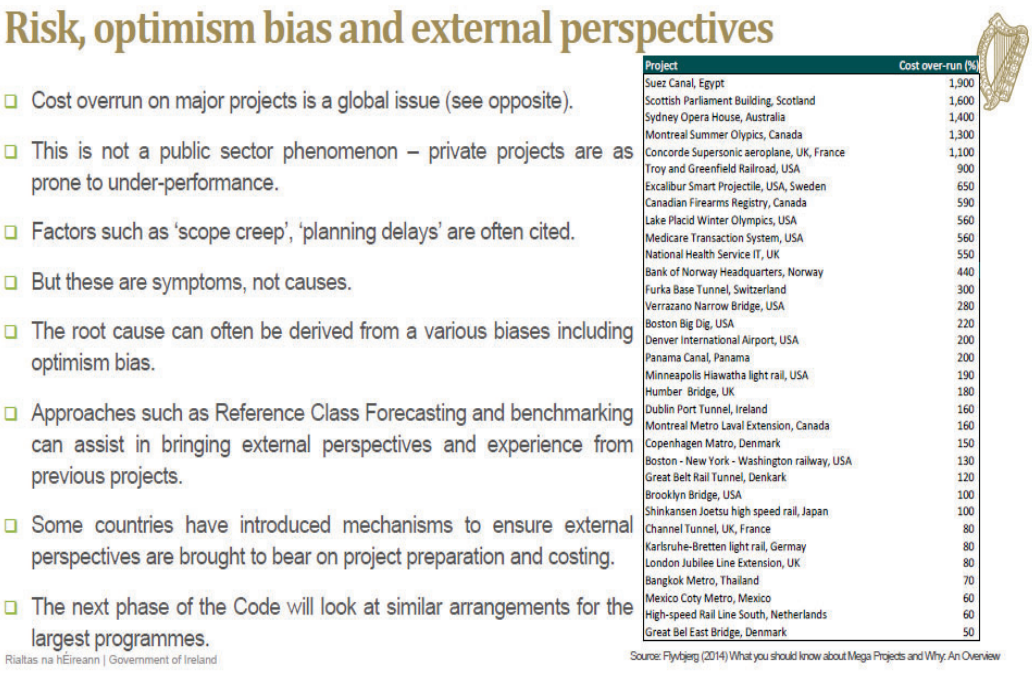


**Figure 4.53 Projects Significant Expenditure Overrun (2019), Government of Ireland, Project Ireland 2040, DPER, Hearne, E., Slide 6.**

Flyvbjerg, B., (2014) stated megaprojects 'are designed to ambitiously change the structure of society.'587

In 2021 it was reported to the Irish Houses of the Oireachtas (2021) that, the National Children's' hospital for example, "project costs can't be determined, moving from an original approved cost of €1.433 billion to an unstated figure".588

587 Flyvbjerg, Bent., (2014)., What you should know about megaprojects and why: an overview. Page 10. Published by Flyvbjerg, Bent., University of Oxford, Said Business School; IT University of Copenhagen; St Anne's College, University of Oxford, Project Management Journal, vol. 45, no. 2, pp. 6-19 DOI: 10.1002/pmj.21409 also on https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2424835 (accessed 28 February 2022) Posted: 14 Apr 2014. Last revised: 6 Jan 2016.

588 Ireland, Houses of the Oireachtas (2021) joint Committee on Health Debate Wednesday 07 July 2021. Pages 6, 7 and 16. Published by Houses of the Oireachtas,

Dublin, Ireland available at https://www.oireachtas.ie/en/debates/debate/joint_committee_on_health/2021-07-07/3/ (accessed 21 November 2021)

Note: The extract on pages 6 and 7 is by Mr. David Gunning Chief Officer of the National Children's Hospital.

"In December 2018, the Government approved an investment decision of €1.433 billion for the project. As communicated to and by Government at the time, this decision excludes items for which there was no price certainly and nor can there be for the duration of the project. These excluded items are construction inflation, statutory changes, any change in scope resulting from healthcare policy changes and the sectoral employment order, SEO. While we now have a compliant programme, the target completion date for the programme is 14 months later than the timeframe upon which the contract was determined. Any elongation of the programme equates to additional cost. There are potential cost implications arising from Covid-related delays, additional health and safety measures, as well as ongoing claims issues that have the potential to contribute to the overall costs. These matters, as well as those associated with the change to the programme duration, are currently subject to commercial mechanisms and are part of the live contract that exists between the NPHDB and BAM, the main contractor. I am, therefore, not in a position to elaborate further at this time as it could compromise our ability to negotiate on behalf of the State at a later date. There is an extremely high likelihood that any discussion on costs, however hypothetical, would prejudice enforcement of the existing contract and very likely negatively impact or jeopardise our current engagements with the contractor."

On page 16 and 17

**Deputy David Cullinane**

I find it unacceptable that Mr. Gunning cannot even give us a number and that he will not get into it. If they are settled, they are settled. There is a vacuum of accountability and transparency around this project. I want to get to the costs as well. When costs were put to Mr. Gunning on the previous occasion he was before the committee, he said:

We are reporting and monitoring progress relative to the €1.433 billion budget. We anticipate that as we arrive at that schedule we will have an updated project budget...".

He went on to say that he expected to be in a position to give that in the first quarter of2021. It is well past the first quarter of 2021. I am asking for a definitive figure relating to claims which are settled. If I am correct, he said that the estimated cost of those 600claims would be €200 million. It is reasonable for me to ask at this point, given that he is not going to give us any more information on what is not outstanding, for information on what is settled. How many claims have been settled and what was the cost of those claims?

**Mr. David Gunning**

As I said, in terms of settled, it is a very small number of the hundreds of claims. I just do not have that information for the Deputy. I am happy to provide it, but I do not have it to hand. The majority of claims remain active at various points along the dispute's mechanism."

I had also noted that even though in our department, budgets of billions are being approved for expenditure in local government on housing and other, there was no attempt by the department to reconcile the financial data expenditure being considered, expenditure being incurred, and expenditure recently ended required as part of annual PSC reporting and published by local government, with my Department's PSC quality assurance reports. That work simply wasn't done. Nobody queries the fact that this PSC quality assurance work was not done, the auditors, DPER, the elected representatives, the citizen. I had recognised this because of the work being done in Cycle 2 where I developed ePSC in response to this need.

I compared the data in the public domain relating to local government projects and programmes quality assurance reports, Project Ireland 2040 public database, and the projects 'more than €10million', which are required to be reported in Department Appropriation Accounts. I'd noted instances footnoted in Department Appropriation Accounts where major projects expenditure had been excluded from the Appropriation Accounts, noted as 'in error'.589 I looked more closely at the Project Ireland 2040 NPF Project Tracker, Ireland.

The Project Ireland 2040 tracker dated December 2020, was referred to in the literature review. This tracker was updated in October 2021, and I was pleased to note that exchequer grants financial information was also included, in the period 2018 to 2027,

589 Department of Housing Local Government and Heritage (2018) Appropriation Accounts Page 14 Note 10 Major Projects. Published by the Office of the Comptroller and Auditor General, Available at https://www.audit.gov.ie/en/find-report/publications/2019/vote-34-housing-planning-and-local-government.pdf (accessed on) 21 November 2021

although it wasn't stated if this was budget or actual grants in 2018-2020, also highlighting, where the data was input, the grants committed under Project Ireland 2040. The Project Ireland 2040 Project and Programme Tracker and Associated Live GIS Map are a source of integrated financial information. But it is incomplete, all on excel and not integrated into a financial database.

There is great potential in these two resources being able to use government financial data through continuous accounting and forecasting, would improve matters considerably and provide assurance to the public as to the stewardship of public funds. The PI2040 register is outdated. It is budget data yet shows completed projects as budget costs no additional column for actual costs and contingencies. The GIS Map data differs by one project which suggests timing difference. They are both excellent information sources and improving annually, but it remains difficult to cross-reference the GIS Map into financials.

The Project and Programme Tracker in October 2021 is improved, it now reconciled with the GIS map, it is "drawn from data provided by relevant Government Departments and agencies" and that it "focusses mainly on projects and programmes with costs greater than €20 million". It now shows projects and programmes less than €20m, and PPPs, as two new categories in the underlying databases. It still noted that the 'tracker serves to highlight the diverse range of infrastructural projects throughout Ireland.' That "management and delivery of the projects and programmes are a matter for the Sponsoring Agency and Approving Authority in each case. The Department of Public Expenditure and

Reform is responsible for setting the overall capital expenditure allocations for the spending Departments." 590

There is no change in the data that the Tracker is recording for Programmes.

There is new and comprehensive additional data relating to financials, in hidden columns and you can't open it unless you copy the tracker into another document as the pages are protected. But when you do these are the headings you now see.

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Project Ireland 2040 Reference | Name of Project | Department/Body responsible for Delivering | Brief Description of Project | Location | Region | Type of Investment | Primary National Strategic Outcome | Brief Description of Current | |
| Construction Commencement Date | Construction Completion Date (Year) | Stage of Project Lifecycle | Project Cost Range (lm) | City | Strategic Assessment Report (Quarter and Year) | Preliminary Business Case (Quarter and Year) | Detailed Project Brief & Procurement Strategy (Quarter and | Tender Documents (Quarter and Year) | |
| Final Business Case (Quarter and Year) | Project Completion Report (Quarter and Year) | Ex-post Evaluation Report (Quarter and Year) | Construction Firm Awarded Contract | Total Estimated Exchequer cost 2018-2027 | Actual cost of project where contract | Total Cost of Project /Programme lm | Costs incurred outside the period of the NDP | Exchequer spend in 2018 (€m) | |
| Exchequer spend in 2019 (€m) | Exchequer spend in 2020 (€m) | Exchequer spend in 2021 (€m) | Exchequer spend in 2022 (€m) | Exchequer spend in 2023 (€m) | Exchequer spend in 2024 (€m) | Exchequer spend in 2025 (€m) | Exchequer spend in 2026 (€m) | Exchequer spend in 2027 (€m) | Date Updated and Official's Initials |

**Table 4.16 Details recorded for the Projects Database have expanded considerably from the details recorded on the Tracker December 2020 Projects Database. The new data is in hidden columns but is accessible if you copy the excel workbook into a new document.**

590 DPER (2021) Project Ireland 2040, Projects and Programmes Tracker at 27 October 2021 Published by DPER, Dublin, Ireland, available at https://www.gov.ie/en/collection/580a9d-project-2040-documents/ (accessed 27 November 2021) Webpage published 28 March 2019 last updated 27 October 2021) Also available at https://www.gov.ie/en/collection/580a9d-project-2040-documents/ (accessed 04 March 2022)

There is significant financial information there linking back to Grants. Still not continuous accounting but a much more transparent step. Once you spot the hidden columns.

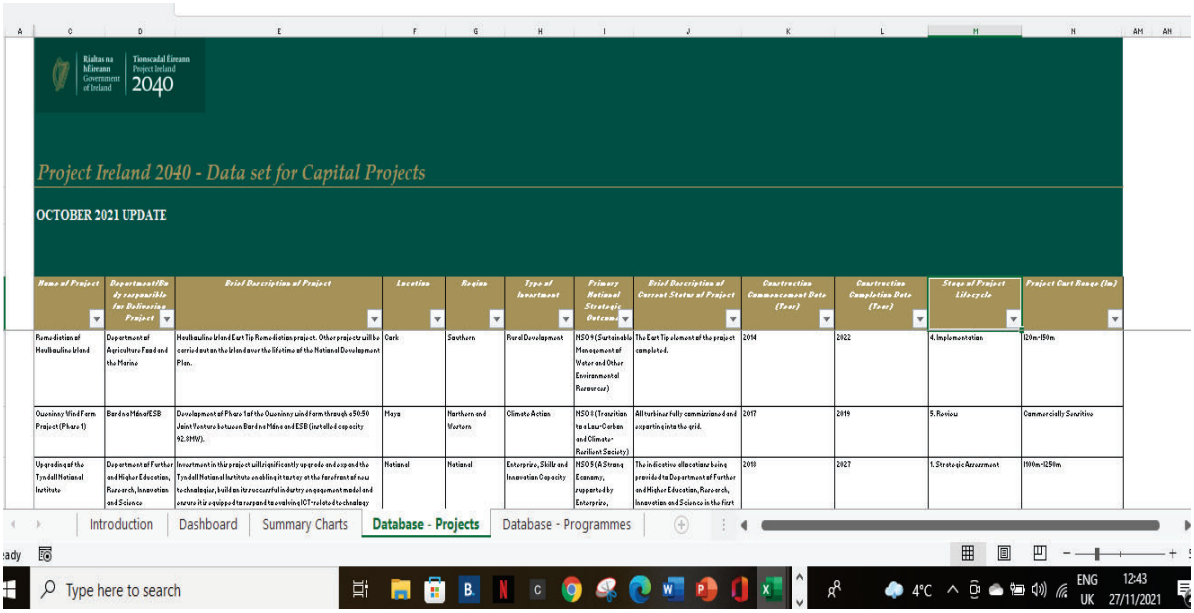


**Table 4.17 Details recorded for the Projects Database have expanded considerably from the details recorded on the Tracker October 2021 Projects Database.**

The Project Ireland 2040 project/programme reference is the only hidden column, in the December 2020 Tracker had. Again, it was accessible if you copy the excel workbook into a new excel workbook.

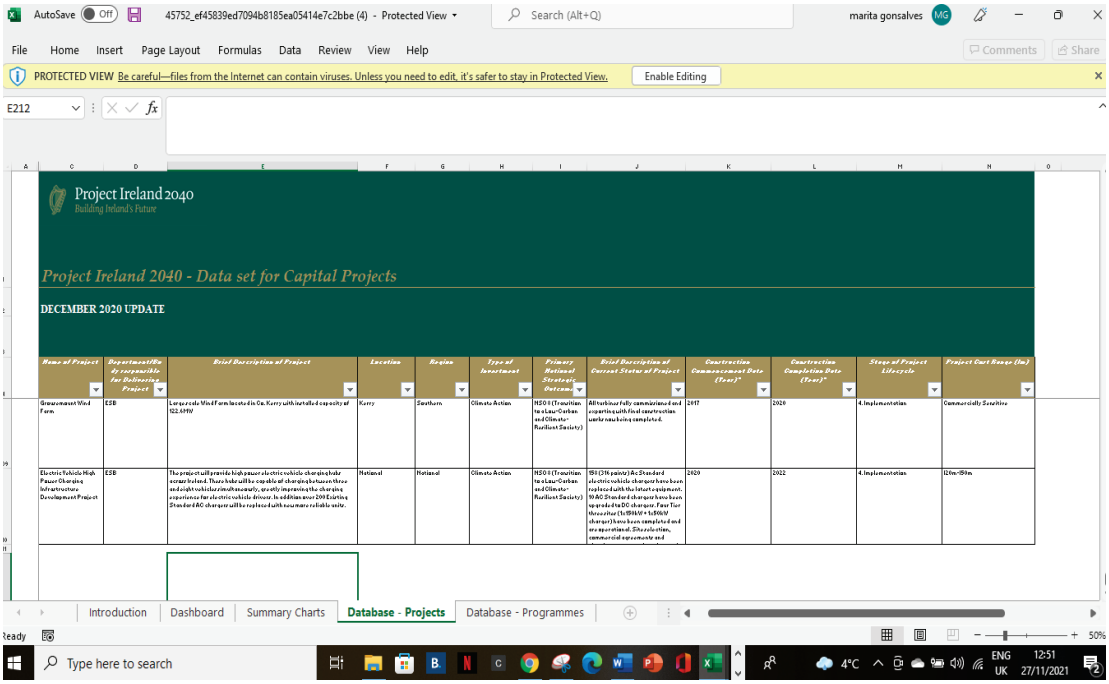


**Table 4.18 Details recorded for the Tracker December 2020 Projects Database. The Project Ireland 2040 reference is the only hidden column, and it is accessible if you copy the excel workbook into a new excel workbook.**

The October 2021 tracker states the 'Summary Charts of this workbook' contains figures that summarise the full database, which allows users to assess static information about Project Ireland 2040.s database of projects and programmes at the time of publication of the tracker." 591 This isn't quite correct, as noted in **table 4.19** below, but the data is available to use outside of the summary charts workbook.

591 DPER (2021) Project Ireland 2040, Projects and Programmes Tracker at 27 October 2021 Published by DPER, Dublin, Ireland, available at https://www.gov.ie/en/collection/580a9d-project-2040-documents/ (accessed 27 November 2021) Webpage published 28 March 2019 last updated 27 October 2021)

The caveats meant the data in the charts was a little more difficult to read as it reported different numbers depending on the chart and exclusions from the chart. The overall number of projects was 376 and of programmes was 135 in the October 2021 Tracker.

I compared the Charts with the underlying data, in my view the Charts are a little misleading, as they don't include new categories (see below). Could another chart have been developed to show the exchequer funding implications (the data in the hidden columns)? Wouldn't that have helped develop Exchequer Funds Financial Appraisal?

| **Totals per Charts and Databases** | **Charts** | **Database** | **Variance** |
|---|---|---|---|
| Number of Projects at each lifecycle stage | 364 | 376 | 12 |
| Number of Projects in each cost range | 209 | 376 | 167 |
| Number of Projects completed each year | 269 | 376 | 107 |
| Number of Projects by Region | 375 | 376 | 1 |
| Number of Projects by Investment Type | 376 | 376 | - |
| Number of Programmes by Investment Type | 135 | 135 | - |

**Table 4.19 Variances between the DPER Project Ireland 2040 October 2021 Summary Charts which 'contain figures that summarise the full database', and the underlying database. By Marita Gonsalves**

The Chart 'Number of projects at each lifecycle stage' differs from the database details by 12, because 3 project categories, Design and Planning, Completed, and PPPs, are excluded from the Chart.

The Chart 'Number of Projects in each cost range' differs from the database by 167 projects because 4 project categories, commercially sensitive projects, projects costing less than €20m, PPPs and projects 'Subject to Appraisal' are excluded.

The Chart ‘Number of Projects completed each year 2018-2027’ differs from the database by 107 projects because it excludes projects subject to appraisal and projects with a completion year of 2028, 2029, 2030, 2031, 2035, 2040.

The Number of Projects by Investment Type includes all projects. The additional financial data isn’t as comprehensive although it would seem to me to be possible to include in Programmes also.

Only one chart was provided for the 135 Programmes. The Chart ‘Number of Programmes by Investment Type includes all Programmes.

The Pie Graph identifies 181 Projects in the Eastern and Midlands, 55 Projects in Northern and Western, 122 Projects in the Southern Region and 17 National Projects. There are 18 National Projects in the Database. This is because on National Project PI0037, Strengthened Science Foundation Ireland Research Centres in Higher Education in all regions, Department of Further and Higher Education, Research, Innovation and Science is included twice. Is anyone checking the data for anomalies before it becomes public data? AI would help this. This Programme is between €500m-€1bn.

Is the Tracker double-counting in instances where a Programme becomes Projects? I’d noted the P!0037 was also recorded as a project. How is the government recording Programmes budgets moving into Projects? Is this budget now being double-counted? I only noted because of the Project Ireland Identified in the hidden column.

PI0037, is also recorded a third time “Upgrading of the Tyndall National Institute a Project emanating from a Programme. The €100-€250m Project notes that “Investment in this project will significantly upgrade and expand the Tyndall National Institute enabling it to stay at the forefront of new technologies, build on its successful industry engagement

model and ensure it is equipped to respond to evolving ICT-related technology opportunities in a fast changing and competitive environment." The project lifecycle stage is reported as being at Strategic Assessment, but also says that construction commenced in 2018 and that €19m of exchequer funding has been spent in the period 2018 to 2021. 592

What happened? Which is correct?

I took a closer look at the sequence of project numbers to see if there was an explanation or if other data might be missing in error. The Project Reference numbers are in another hidden column, B, shown below in **Figure 4.19**. I had originally undertaken this exercise using the Project Ireland 2040 database to December 2020. I had noted gaps in the allocation of unique Project identifiers, but because of the new issue project programme treble count I'd noted I decided to re-do it using the updated, and much more comprehensive database and consider both. I'd noted gaps in the sequencing of PI2040 identifiers when checking the Tracker December 2020. There wasn't an explanation for gaps in the sequences of unique project/programme identifiers in the introduction, 409 in total at that time. All references commenced from P10001 to P11019 and by October 2021 more numbers extended to PI1330.

592 DPER (2021) Project Ireland 2040, Projects and Programmes Tracker at 27 October 2021 Project Database, Programme Database, PI0037, Published by DPER, Dublin, Ireland, available at https://www.gov.ie/en/collection/580a9d-project-2040-documents/ (accessed 27 November 2021) Webpage published 28 March 2019 last updated 27 October 2021)

Sequences differences were noted, some highlighted below. Changes to the December 2020 tracker gaps in the October 2021 have been highlighted in blue, and explanation sought in the data.

| | | | | | |
|---|---|---|---|---|---|
| P10008 | 102-108 | 189 | 317 | 417 | 613-614 |
| 10 | 110-115 | 194 | 322 | 425 | 618-619 |
| 14 | 118 | 197 | 329-337 | 427-511 | 621-623 |
| 15 | 119 | 202-229 | 339-346 | 517-520 | 625-665 |
| 16 | 121 | 242 | 349 | 522-527 | 674-796 |
| 35 and 36 not on 2021 register were on 2020 register | 122 | 244-249 | 350 | 537 | 798-808 |
| 40 | 123 | 268-279 | 352-353 | 539-549 | P11009-11012 |
| 41 | 126 | 281-283 | 358 | 553-571 | |
| 42 | 127 | 291 | 363 | 574 | |
| 43 | 128 | 295 | 372 | 576-578 | |
| 44 | 129 | 298=301 | 374 | 581-585 | |
| 45 | 132 | 304-305 | 378 | 587 | |
| 47-73 | 164-180 | 311 | 398 | 594-595 | |
| 76-86 | 187 | 312 | 408 | 610-611 | |

**Table 4.20 Project Ireland 2040 (At December 2020 and October 2021) Unallocated project/programme numbers out of sequence and no explanation for same.**

Examples noted include:

Projects appear to be dropped and Project numbers have changed, for example, PI0117 Skibbereen Flood Relief Scheme is on the December 2020 tracker noted as being implemented under construction costing €20m-€50m but was not on the October 2021 tracker. PI0120 Hammond Lane Development, Courts Service also on the December 2020 tracker noted as Final Business Case, commercially sensitive, was reallocated a new

number in the October 2021 Tracker, PI1248 and was noted as Preliminary Business Case and commercially sensitive.

Projects are renumbered for example the Abbey Theatre project was PI0133 in December 2020 and had been reallocated as PI1021 in October 2021.

Although the database reference numbers appeared to be sequential and apply to both projects and programmes irrespective, one Project and one Programme had been allocated the same project number in the December 2020 Tracker and no other instance of this was noted in that version. In the October 2021 Tracker there is no change.

> PI0404 –The Water Supply Project - Eastern and Midlands Region will represent the first major comprehensive upgrade of 'new source' infrastructure in over 60 years and will meet the domestic and commercial needs of over 40% of Ireland's population into the medium to long term. Eastern and Midland NSO 9 (Sustainable Management of Water and other Environmental Resources). Concept Design. Irish Water 2024-2027, 2. Preliminary Business Case €1 billion+ Project.
> PI0404 Swimming Pools Department of Tourism, Culture, Arts, Gaeltacht, Sport and Media -This programme provides grant aid to local authorities towards the capital costs of new swimming pools or the refurbishment of existing pools, with four projects remaining in the current round. National Culture, Heritage and Sport. NSO 7 (Enhanced Amenity and Heritage). Lucan is under construction and is expected to be completed in 2021. Buncrana and Edenderry are at Contract Documents stage Q4 2022 €20m-€50m. Programme.

In one instance in the December 2020 Tracker Irish Water had allocated a Project number and the same number with an (a) for two projects in two different regions. No other instances of inserting a Project Number adding (a) was noted. PI0397a is now PI1238.

> **"PI0397**, Regional Biosolids Storage Facility, Irish Water, The Regional Biosolids Storage Facility is a facility for the storage of treated biosolids produced from wastewater treatment plants in greater Dublin. The new biosolids storage facility will form a key part of the upgraded wastewater treatment network for greater Dublin and will facilitate its continued social and economic growth while protecting the environment. Dublin, Eastern and Midland, Design, 2022-2024 Final Business Case €20m-€50m

**PI0397a** Skibbereen Regional Water Supply Scheme - Water Treatment Plant & Network. Irish Water. The proposed Skibbereen Regional Water Supply Project addresses the water quality deficiencies in Schull, Leap, Baltimore, Drimoleague and Skibbereen. Cork. Southern. Construction. 2019-2021. 4. Implementation. €20m-€50m"

It is important to consider the background to Project Ireland 2040. Eolas (2018) summarises effectively, the magazine highlights how Ireland's public infrastructure spending was severely curtailed following the 2008 economic collapse, and that the result is "an existing infrastructural deficit which is failing to keep step with the country's rapid growth, with the potential to hinder efforts to achieve optimal potential in terms of economic competitiveness and performance in the future." Also stating "resource allocation for projects which support the priorities of the NPF is to be guided by a new funding model for Exchequer-funded public investment" that "four new funds totaling a combined €4billion" in that lifetime "will be allocated through a competitive bidding process to encourage collaboration" and that "project proposals should demonstrate a vision in line with the NPF objectives including rural renewal, urban regeneration and climate action targets, while drawing on disruptive technologies".593

An opportunity for integrating AI, ML, RPA, Blockchain in financials and policy governance. But these technologies not yet used the financial monitoring processes? Truly an opportunity not to be missed.

But notwithstanding same there is greater transparency and details of grants allocations, successful contractors, and in other cases, the date the Tracker was updated

593 EOLAS Magazine., (2018), The National Development Plan in Brief. Paragraphs 1, 2, and 13. Published by EOLAS Magazine, Dublin Ireland available at https://www.eolasmagazine.ie/the-national-development-plan-in-brief/ (accessed 06 December 2021) [Note: No name on the online article]

and the officers' initials. These details weren't provided when this project number was reassigned. A question arises as to why initials are required, and, whether there are GDPR implications as that person might be identifiable, especially in smaller public entities.

The Tracker Chart query tool for graphs stated that it excludes projects/programmes under the categories 'commercially sensitive' to protect the procurement process and 'subject to appraisal' noting those projects may not progress. But the government reports on 'expenditure being considered' under public spending code where 'commercially sensitive' isn't a category and 'expenditure being considered' may not progress. Confusing for the citizen, when all this data is being shared so transparently in the public domain. This is where AI augmented continuous budgeting linked to the allocated budgets and continuous accounting and reporting could really help.

The database is linked to an interactive map myProjectIreland, which showed 947 projects, which can be searched by Eircode.594

The myProjectIreland interactive map is available in a Desktop or Mobile version is noted as "Beta" that, "This is a prototype - your feedback will help us to improve it." and that it was last updated on 28 October 2021. This iteration of the map does not contain data on National Programmes, however, the Tracker includes details of capital National Programmes that cover the entire country.595 The only observations I wished to make was

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594 DPER, (2021) Project Ireland 2040 MyProjectIreland Mobile Interactive Map. Published by DPER, OSI and ESRI, Dublin, Ireland. Available at https://geohive.maps.arcgis.com/apps/webappviewer/index.html?id=26b6e93dcd1044ff8fa2bd1a772a6080 (accessed 22 November 2021)

595 DPER (2021) myProjectIreland interactive map October 2021 Published by DPER, ESRI and ESRI available at https://www.gov.ie/en/campaigns/09022006-project-ireland-2040/ (accessed 27 November 2021)

that the interactive map provides very comprehensive data, it records 947 projects more than the 346 Tracker projects. It doesn't include financial details when you search for a project, which is an enhancement which would be beneficial for the user, if implemented, in a future iteration. The dashboard seen below, provides a lot of useful information.

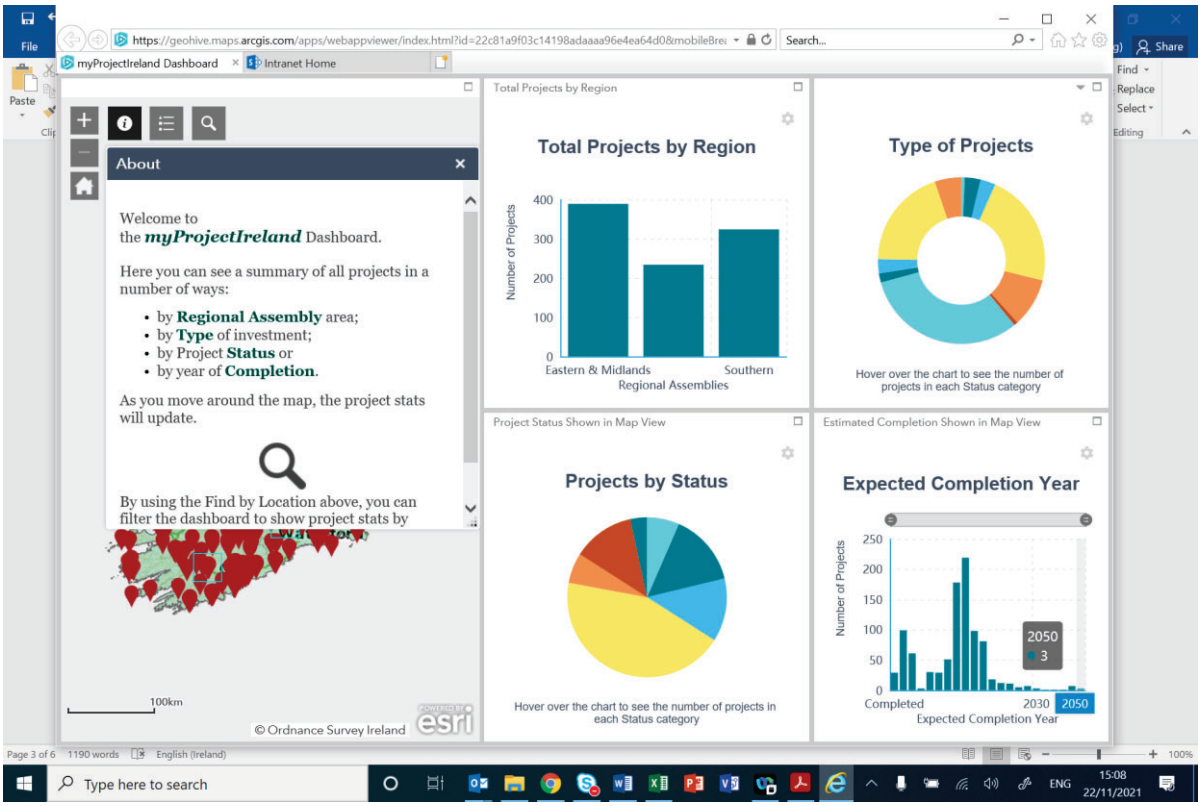


**Figure 4.54 MyProjectIreland Mobile highlights 947 projects Published by DPER, ESRI and OSI at 27 November 2021 https://geohive.maps.arcgis.com/apps/webappviewer/index.html?id=22c81a9f03c14198adaaaa96e4ea64d0&mobileBreakPoint=539&center=603792,741498,2157**

There is no project or programme on the Tracker with an expected completion of 2050 there are three on the interactive map. Which is correct? Are both correct? There is need for AI enabled, continuous financial budgets forecasts and actuals.

It isn't clear how decommissioning costs are included in relevant projects PI1017, Grousemount Wind Farm, is a large-scale Wind Farm located in Co. Kerry with an installed capacity of 122.6MW in full operation, all construction works completed a project under Climate Action, is noted as completed and at Review stage. It is 'commercially sensitive' per the Project Ireland 2040 tracker October 2021, but the capital costs for installation in planning Environmental Impact Statement 2015, are stated as being in the region of €180m, also that there would also be decommissioning costs. 596

I considered the Irish Fiscal Advisory Council use of financial data. Conroy, N., Casey, E. and Jordan-Doak., E. Irish Fiscal Advisory Council (2021), stated that 'Ireland has had a poor track record in preventing substantial public investment cost overruns', that,

> "This is true of specific high-profile projects like the National Broadband Plan and the National Children's Hospital, but it is also visible for general investment plans, which have tended to be revised up systematically in economic upturns. Ramping up public investment at the same time as there are shortfalls in construction workers could compound these problems."

596 Grousemount Windfarm (2015) Environmental Impact Statement Volume 1 of 3. Pages 2.7/22 and 2.18/22 Published by Grousemountwindfarm Ltd, Kerry, Ireland available at https://www.grousemountwindfarm.ie/documents/downloads/EIS%20Vol%201%20-%20Section%202%20-%20Description%20of%20Project.pdf (accessed 26 November 2011)

Also stating "if Ireland is to avoid further overruns and poor value-for-money outcomes in future, it will need to improve how public investment spending is governed." and

"Past reports have highlighted the substantial scope for the Irish authorities to adopt policies that will help improve how public investment is managed. In particular, past recommendations from the IMF suggest that the Department of Public Expenditure and Reform needed to take on more responsibility ensuring value for money is achieved in capital projects. Changes proposed and introduced in recent years include many good initiatives, which may result in better value for money. However, their success will be difficult to assess, and a high degree of diligence will be required, given capacity constraints, the high scale of investment, and the greater need to ensure value for money with high government debt levels. Careful planning and management of public investment spending will be essential. 597

They'd quoted figures in the report which were sourced from the National Development Plan (NDP) allocations for 2021-2025.

597 Conroy, N., Casey, E. and Jordan-Doak., E. Irish Fiscal Advisory Council (2021), "Ireland's next ramp up in public investment". Irish Fiscal Advisory Council Analytical Note Series No. 13. Dublin. Published by Conroy, N., E. Casey, and E. Jordan-Doak, Irish Fiscal Advisory Council, Dublin, Ireland Available at: https://www.fiscalcouncil.ie/wp-content/uploads/2021/11/Irelands-next-ramp-up-in-public-investment-Nov-2021.pdf (accessed 28 November 2021)

**Table 4: National Development Plan allocations for 2021 to 2025**

€ millions unless otherwise stated

| | 2021 | 2022 | 2023 | 2024 | 2025 | 2021-25 | Share of total 2021-25 |
|---|---|---|---|---|---|---|---|
| Housing, Local Government & Heritage | 2,766 | 3,400 | 3,516 | 3,866 | 4,016 | 17,564 | 29.7% |
| Transport | 2,511 | 2,547 | 2,614 | 2,664 | 2,665 | 13,001 | 22.0% |
| Health | 905 | 1,010 | 1,127 | 1,255 | 1,360 | 5,657 | 9.6% |
| Education | 740 | 792 | 860 | 940 | 1,040 | 4,372 | 7.4% |
| Environment, Climate and Comm's | 579 | 700 | 850 | 950 | 1,100 | 4,179 | 7.1% |
| Further and Higher Education, Research, Innovation and Science | 500 | 538 | 579 | 620 | 652 | 2,889 | 4.9% |
| Enterprise, Trade and Employment | 432 | 523 | 558 | 584 | 611 | 2,708 | 4.6% |
| Agriculture, Food and the Marine | 271 | 281 | 284 | 287 | 290 | 1,413 | 2.4% |
| Justice | 258 | 270 | 272 | 274 | 278 | 1,352 | 2.3% |
| Office of Public Works | 206 | 270 | 270 | 288 | 310 | 1,344 | 2.3% |
| Tourism, Culture, Arts, Gaeltacht, Sport and Media | 172 | 202 | 206 | 210 | 214 | 1,004 | 1.7% |
| Rural & Community Development | 169 | 192 | 196 | 200 | 205 | 962 | 1.6% |
| Defence | 131 | 141 | 141 | 142 | 142 | 697 | 1.2% |
| Children, Equality, Disability, Integration and Youth | 32 | 33 | 40 | 50 | 100 | 255 | 0.4% |
| Public Expenditure and Reform (less OPW) | 15 | 33 | 30 | 20 | 20 | 118 | 0.2% |
| Foreign Affairs | 13 | 25 | 25 | 25 | 25 | 113 | 0.2% |
| Finance | 18 | 22 | 22 | 22 | 23 | 107 | 0.2% |
| Social Protection | 16 | 16 | 16 | 16 | 17 | 81 | 0.1% |
| | | | | | | | |
| Shared Island Fund | 50 | 50 | 100 | 150 | 150 | 500 | 0.8% |
| Annual Priority Reserve | - | - | 51 | 148 | 269 | 468 | 0.8% |
| European Regional Development Fund | - | 70 | 100 | 115 | 115 | 400 | 0.7% |
| | | | | | | | |
| Total | 9,784 | 11,115 | 11,857 | 12,826 | 13,600 | 59,162 | 100.0% |

Sources: Department of Public Expenditure and Reform (2021) National Development Plan 2021 – 2030.

**Table 4.21 Ireland, DPER, National Development Plan (NDP) allocations for 2021-2025, published by the Irish Fiscal Advisory Council**

The December 2020 Tracker Programme Timescale and Proposed Completion Date Database stated "reflects the period for which funding for the Departments has been allocated from 2018 out to 2022, (or 2027 where allocations have already been made, and does not signify the lifecycle of the programme/ grant.)"598 I found that the October 2021

598 DPER., (2020),Investments Projects and Programmes Tracker available at https://www.gov.ie/en/publication/6db7c4-investment-projects-and-programmes-tracker/

Tracker had even more data but wasn't directly referenced/linked back into the multi-annual budgets or into allocations. Notwithstanding same, it is a positive step.

The data is still being populated and many projects in the €116bn initiative do not have exchequer costs financial details included. Continuous budgeting and accounting would enhance this space. Government could use AI to create a better budgeting and financial reporting environment for politicians, public servants, the commercial sector, and citizens. 599

| *Total Estimated Exchequer cost 2018-2027 €m* | *Actual cost of project where contract has been signed €m* | *Total Cost of Project /Programme €m* | *Costs incurred outside the period of the NDP* |
|---|---|---|---|
| 3,630,155,224 | 266,435,411 | 4,435,104,161 | 317 |

**Table 4.22 Total estimated exchequer costs 2018-2027 records €3.6bn out of the budgeted €116bn on the Project Ireland 2040, Projects and Programmes Tracker 27 October 2021 Published by DPER, Dublin, Ireland**

(accessed 30 November 2021). Accessed 30 November 2021) {Website last updated 11 December 2020 replacing the January 2020 version]

[Note: There is no reference on this government webpage to the newer version of this Tracker published at October 2021. This can make it confusing for a citizen searching.]

599 DPER (2021) Project Ireland 2040, Projects and Programmes Tracker at 27 October 2021 Published by DPER, Dublin, Ireland, available at https://www.gov.ie/en/collection/580a9d-project-2040-documents/ (accessed 27 November 2021) Webpage published 28 March 2019 last updated 27 October 2021)

The October 2021 Tracker states ‘future iterations of the capital investment tracker will, take into account, the investment plans in the revised National Development Plan 2021-2030’. 600

An additional budget commitment of €49 billion isn’t included in this iteration. Why not? The budget commitment was published on 04 October 2021.

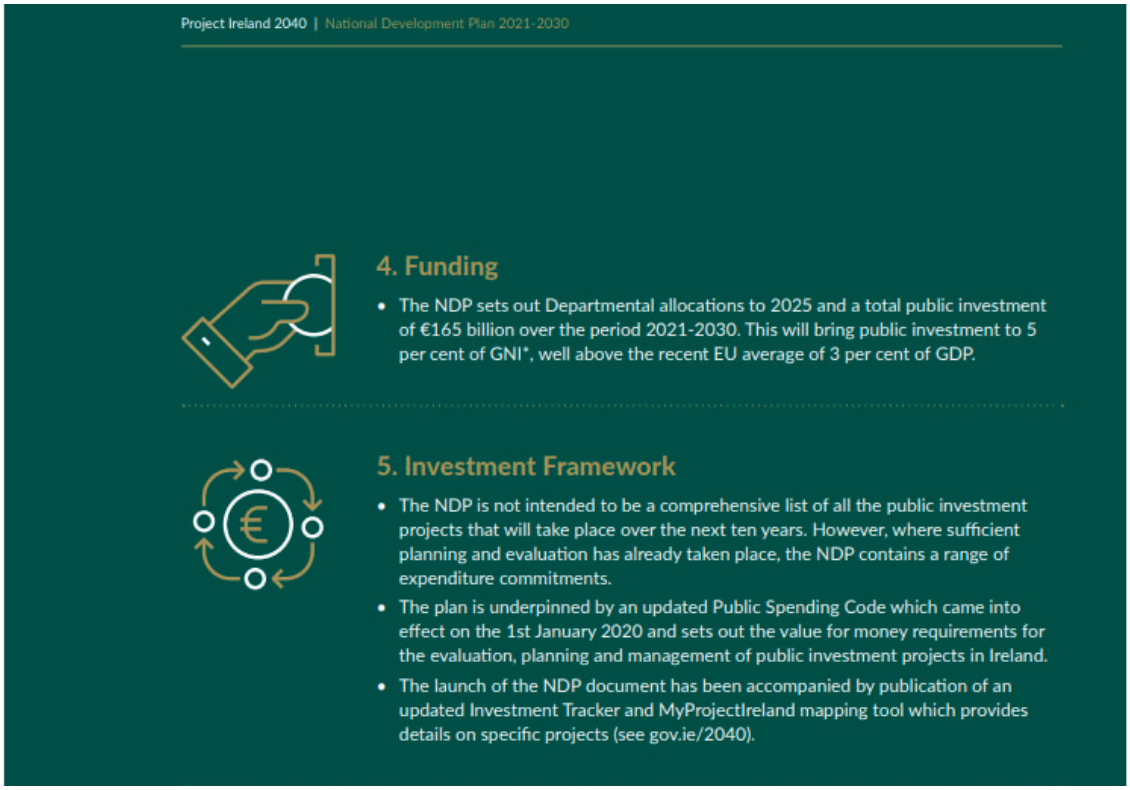


**Figure 4.55 Project Ireland NDP 2021-2030 published 04 October 2021**

Dáil members scrutinize the expenditure for example **Deputy Peadar Tóibín** asked the Minister for Public Expenditure and Reform, the amount both as a percentage and in euro

600 DPER (2021) Project Ireland 2040, Projects and Programmes Tracker at 27 October 2021 Project Database, Programme Database, PI0037, Published by DPER, Dublin, Ireland, available at https://www.gov.ie/en/collection/580a9d-project-2040-documents/ (accessed 27 November 2021) Webpage published 28 March 2019 last updated 27 October 2021)

of the National Development Plan which was allocated to development outside of Dublin" (part of the question). Part of the written response referencing estimates and states

> "The earlier these projects are in the project life cycle the higher the level of uncertainty in relation to risks and costs. It wouldn't be wise to try and provide a false sense of certainty on exactly how projects will fare as they proceed through all the necessary approval processes. As such, projects which are further along the project life cycle have more accurate cost and timeline estimates. A project without a finalised business case, a developed design, or planning approval is unlikely to have accurate estimates, particularly where these projects are potentially large and complex. "[601]

I checked other debates and noted another written response at the Dáil Debate Tuesday 16 November (2021) on ProjectIreland2040 which referenced the Project Ireland Delivery Board additional expert knowledge. Part of the response states:

> "The NDP 2021-30 was published on 4th October, committing to an overall investment of €165 billion in the years from 2021 to 2030.
>
> It is important to acknowledge that the majority of public investment projects are delivered on budget and on time and there is a high level of professionalism across the sectors. Reforms are ongoing in governance and broader capability to help ensure successful delivery.
>
> The Projects and Programmes Tracker was also updated amongst other publications with the launch of the NDP; this provides detailed information about the progress made on the implementation of Government's investment priorities in the coming years.
>
> The Project Ireland 2040 Delivery Board, comprises Secretaries General of the major capital spending department and oversees the delivery of the NDP. The Delivery Board is being extended with up to 5 new members to bring additional expert knowledge, independent and regional perspectives, and an enhanced challenge function." 602

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601 Government of Ireland, Houses of the Oireachtas., (2021), Pages 103 and 104, **Deputy Peadar Tóibín** to the Minister for Public Expenditure and Reform. Dáil Éireann 33rd Dáil, Dáil Debate Tuesday 16 November 2021 Parliamentary Question 245 Vol. 1014 No. 1 Last updated 21 Dec 2021 17.00 Unrevised. Published by the House of the Oireachtas, Dublin, Ireland, available at https://data.oireachtas.ie/ie/oireachtas/debateRecord/dail/2021-11-16/writtens/mul@/main.pdf Accessed 28 February 2022) (accessed 28 February 2022)

602 Government of Ireland, Houses of the Oireachtas., (2021), Pages 109 and 110, Deputy Bernard J. Durkan to the Minister for Public Expenditure and Reform. Dáil Éireann 33rd Dáil, Dáil Debate Tuesday 16 November 2021 Parliamentary Question 245 Vol. 1014 No. 1 Last updated 21 Dec 2021 17.00 Unrevised. Published by the House of the

Again, it made me think about AI augmented financials

Greater transparency with AI augmenting budgets, financial statements and continuous reporting. Better artificial governance?

Introducing AI continuous budgets and forecasts would address these issues and the Tracker and GIS Map databases, once linked with the government central financial database used to produce CSO, EUROSTAT and IMF financial reports would be real time providing valuable real time reporting for decision-makers, also for the citizen. Why, in this day should a citizen have to wait months, sometimes almost a full year, before government financial statements are available. PI2040 integrated with financial and budgetary reporting systems.

There is an argument for improved financials using AI real time continuous accounting and longer-term AI augmented forecasts as this data is key for understanding the finances and fiscal needs of Ireland. Fragmented reporting is also open to the risk of error, fraud, ML/FT.

A growing disconnect between money and delivery pressures and untimely financial information. Public financial management in need of a digital and AI overhaul. How could AI help?

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Oireachtas, Dublin, Ireland, available at https://data.oireachtas.ie/ie/oireachtas/debateRecord/dail/2021-11-16/writtens/mul@/main.pdf Accessed 28 February 2022) (accessed 28 February 2022) also at https://www.oireachtas.ie/en/debates/question/2021-11-16/254/?highlight%5B0%5D=56144&highlight%5B1%5D=21 (Accessed 26 November 2021)

Note: The five experts were appointed in 2022 https://www.gov.ie/en/press-release/616ca-minister-mcgrath-appoints-five-external-members-to-project-ireland-2040-delivery-board/.

#### 4.10.1.3 Fraud, Corruption, AML/CFT.

AI and ML use of financial data is well established in some areas, and I had seen reported instances of AI use in predictive tools in Justice for profiling and to review financial transactions. The Council of Europe, European Commission for the Efficiency of Justice., (CEPEJ), (2018), Ethical Charter on the use of AI in Judicial Systems and their environment, cites examples of AI predictive tools in justice systems for example their use in criminal trials, including review of financial transactions:

> "Connect, which is used by the UK police to analyse billions of data generated in financial transactions to find correlations or patterns of operations, or the International Child Sexual Exploitation Database (ICSE DB), managed by Interpol, which helps identify victims and/or perpetrators through the analysis, for example, of furniture and other objects in abusive images, or the analysis of background noise in videos, have proven particularly effective in fighting crime.
>
> With Connect, for example, searches that previously required months of investigation can now be performed in minutes, with a very high level of complexity and volume of data."

They also noted "anti-money laundering units use "predictive" systems to identify suspicious financial flows, but in the case of quantitative (financial) information, machines are more able to produce reliable results" also, that "researchers should also have better access to these data to produce relevant studies for policy-makers" and that "public decision-makers are beginning to be increasingly solicited by a private sector wishing to see these tools – which are sometimes "beta" versions, i.e. they will evolve over time – integrated into public policies. The Charter is intended for public and private stakeholders who design and deploy AI tools and services involving processing judicial decisions and data and it concerns public decision-makers in charge of the legislative or regulatory

framework, of the development, audit or use of such tools and services. They recommend an ethical charter and emphasise that any public debate must involve all stakeholders including citizens.603

As noted earlier, in the Literature review, the FATF video on money laundering highlights that 'money laundering is not a victimless crime'. The words of the video say:

> In a globalised world where technology allows money to move quickly anywhere, fighting money laundering is more urgent than ever. Trillions of dollars are laundered each year. That money fuels serious crime, drug deals, sexual exploitation, human exploitation. Money laundering harms society. The Financial Action Task Force is leading global action by setting international standards for countries to regulate financial industries to help authorities find, freeze, confiscate, the money of criminals. Together we can combat money laundering and serious crime.
> Financial Action Task Force Taking the money out of crime and terrorism."
>
> And the video closes with the image "#followthemoney." 604

The USA government financial crimes enforcement network explanation of money laundering and its' impact, is powerful too, it makes you think as a public servant about your obligations when you are entrusted with budgets and approving financial expenditure:

> With few exceptions, criminals are motivated by one thing-profit. Greed drives the criminal, and the end result is that illegally-gained money must be introduced into the nation's legitimate financial systems. Money laundering involves disguising financial assets so they can be used without detection of the illegal activity that

603 European Union, Council of Europe, European Commission for the Efficiency of Justice., (CEPEJ), (2018), European Ethical Charter on the Use of Artificial Intelligence in Judicial Systems and their environment. Pages 5, 14, 16, 51, and 66. Published by CEPEJ, Strasburg, France at https://www.coe.int/en/web/cepej/cepej-european-ethical-charter-on-the-use-of-artificial-intelligence-ai-in-judicial-systems-and-their-environment (accessed 15 September 2021)

604 FATF (2021) Money Laundering is not a victimless crime Published by the FATF, location on Youtube at https://www.youtube.com/watch?v=T1_1hnLbCI0 (accessed 21 November 2021.

> produced them. Through money laundering, the criminal transforms the monetary proceeds derived from criminal activity into funds with an apparently legal source. This process has devastating social consequences. For one thing, money laundering provides the fuel for drug dealers, terrorists, arms dealers, and other criminals to operate and expand their criminal enterprises.
> We know that criminals manipulate financial systems in the United States and abroad to further a wide range of illicit activities. Left unchecked, money laundering can erode the integrity of our nation's financial institutions.605

IMF Global reports include the World Economic Outlook, Global Financial Stability Report, Fiscal Monitor, and Global Policy Agenda reports. The Global Policy Agenda (2021) report key priorities include "calibrate policies to limit scarring, support the recovery, and counter growing divergences within and between countries; and accelerate the transformation of the global economy to achieve a more inclusive, greener, and digital recovery". 606

The IMF (2021) Country report the Netherlands states "Anti-Money Laundering /Countering the Financing of Terrorism is a key financial stability and integrity issue in the Netherlands" referencing introduction of a central register for beneficial owners of legal persons established in 2020.

> Given the open nature of its economy, the Netherlands should continuously monitor international financial flows and carry out analysis to remain agile in its risk-based supervisory activities. A central register for beneficial owners of legal persons went live in September 2020. The authorities should continue refining the accuracy of the beneficial ownership information and promptly establish the planned beneficial

605 USA United States Federal Government, Financial Crimes Enforcement Network, (2021) What is Money Laundering? Paragraphs 1-3 Published by the United States Federal Government, Financial Crimes Enforcement Network, Location here, Website at: What is money laundering? | FinCEN.gov (accessed 20 November 2021)

606 IMF., (2021), Global Policy Agenda report webpage https://www.imf.org/en/Publications/Policy-Papers/Issues/2021/10/12/The-Managing-Director-s-Global-Policy-Agenda-Annual-Meetings-2021-489894 (accessed 16 November 2021)

> ownership register for legal arrangements (e.g., trusts). The Netherlands should continue to prioritize close inter-agency and international cooperation among AML and tax authorities.

Also noting 'the robustness of the Netherlands' AML/CFT framework and its effectiveness is currently being assessed by the Financial Action task Force'. 607

The introduction of a central register for beneficial owners of legal persons established in 2020 made me think about autonomous vehicles, Sofia Robot Citizen, the AI software VITAL with Voting Rights on the Company Board the AI DAOs and concept of legal persons, also of the Carnegie Council Leximancer map and disconnect between AI and a DAO, the electorate and Accounts.

The IMF (2021) Ireland country report highlighted AML/CFT in the context of Investment Funds who "own nearly half of commercial real estate in Ireland" that the "recent FATF mutual evaluation report and the legislative amendments that Ireland has made to ensure its framework is in line with international standards, the authorities should continue to implement an AML/CFT risk-based supervisory framework (for both bank and non-bank financial institutions), also that:

> "Enhancing the resilience of the sector requires adopting a system-wide perspective with a focus on potential spillover effects, in close coordination with other European authorities. This would ideally include the development of a strong EU macroprudential framework that encourages consistent risk management practices across the sector.

607 IMF., (2021), Country Report Kingdom of the Netherlands – The Netherlands, Page 19 and footnote 13. Published by the IMF, Washington DC, USA available at https://www.imf.org/en/Countries/NLD (accessed 16 November 2021) (Published November 2021)

The report also stated, “more than a third of Investment Funds in the euro area are registered in Ireland.” 608

The European Banking Authority, (EBA) (2021), “is required to ensure the integrity, transparency and orderly functioning of financial markets. As part of this mandate , the EBA works to prevent the use of the financial system for the purposes of money laundering and terrorist financing (ML/TF)”.609 Guidelines on money laundering and terrorist financing risk factors compliance table noted some countries competent authorities Poland, Sweden and Norway, who had stated that they did not comply with or intend to comply with the revised guidelines citing the reasons why.

> “These revised guidelines on ML/TF risk factors take into account changes to the EU Anti Money Laundering and Counter Terrorism Financing (AML/CFT) legal framework and new ML/TF risks, including those identified by the EBA’s implementation reviews and in the ESAs’ 2019 Joint Opinion on ML/TF risks. They include new guidance on ML/TF risk assessments, customer due diligence for beneficial owners and compliance with the provisions on enhanced customer due diligence related to high-risk third countries. They also incorporate new sectoral guidance on crowdfunding platforms, corporate finance, payment initiation services providers (PISPs) and account information service providers (AISPs) and for firms providing activities of currency exchange offices.” 610

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608 IMF Country Report (2021) Country Report Ireland. Pages 11, 13, 17, footnote 9 Published by the IMF, Washington DC, USA available at https://www.imf.org/en/Countries/IRL (accessed 16 November 2021) (Published June 2021)

609 European Banking Authority (2021) Anti-money Laundering and Countering the Financing of Terrorism website Paragraph 1. Published by the EBA, https://www.eba.europa.eu/regulation-and-policy/anti-money-laundering-and-countering-financing-terrorism (accessed 20 November 2021)

610 European Banking Authority (2021) Revised Guidelines on Money Laundering and Terrorist Financing, Compliance Table, Published by the https://www.eba.europa.eu/regulation-and-policy/anti-money-laundering-and-e-money/revised-guidelines-on-ml-tf-risk-factors (Accessed 20 November 2021)

The IMF (2021) EU regional economic outlook report differentiates between emerging European Economies and advanced European Economies, noted "challenges facing policymakers include boosting productivity growth, tackling the problems posed by aging populations, and filling gaps in green and digital infrastructure." 611 Harmonisation across the EU and indeed globally would be important in financial management terms.

### 4.10.2 Excel Reigns

*Describe the situation:* What are we required to do here? What are we trying to do here? What thinking underpins what we are doing?

Every day really dedicated people in public sector manage and approve billions. Would public sector employees recognise money laundering or terrorist financing when they are reviewing financing across entities? How can AI augmented budgets and financial reporting, blockchain and robotics help?

It can in budgeting for example. I had just been involved in preparing a major policy budget for Ireland's Strategic Housing for All budget. Done on a excel spreadsheet with three workbooks, not linking into longer term budgets of the EU or Ireland Project Ireland 2040 projects or programmes. Why, with everything available are we still developing major policy budgets in such a confused and fragmented way?

I thought to explore some aspects of financials to see what was available for public modelling today. I started by examining fiscal models, then financial models for

611 IMF (2021) Regional Economic Outlook Pages viii and 14. Published by the IMF, Washington DC, USA. Available at https://www.imf.org/en/Publications/REO/EU/Issues/2021/10/20/regional-economic-outlook-for-europe-october-2021 (accessed 16 November 2021)

forecasting, budgets, using Ireland's financial data as a case study. I looked to see how continuous accounting and continuous reporting could be trialed. The intent was to show how AI could enhance each of these for Public Sector.

I didn't test any methods to explore the risk of ML/CFT. In my career, I'd encountered matters that necessitated reporting to the appropriate authorities internally about ML risk and externally to the Police in cyber risk capacities. There was almost nothing I could think of that could possibly improve their work and their use of AI. I thought about the advocacy role, educating public servants about ML/CFT, fraud and corruption with practical examples, and I wondered was there a "financial skills for all" course available online, and if it existed, could it, in Ireland for example, be put onto the national training platforms including the Civil Service OneLearningManagementSystem (LMS).

I had done this for my own Government Department as Acting head of ICT. I introduced a course about Cyber Security end user awareness developing it myself, running workshops, The interactive element and the examples were a huge success in awareness raising, allowing everyone know how important their role was in cyber security, protecting the Department, also taking the fear/mystery of Cyber risk away. It became mandatory training programme about a year into the cyber awareness programme, at which time, I had provided training to both ICT specialist and non-specialist staff to host training sessions themselves and later had procured cyber security training modules which were put up on the Department LMS. Could this thinking, and approach work? Financial ability for all? Using AI augmented financials and training for same, also approved training to recognise ML/CFT for non-accountants involved in managing and approving budgets?

### 4.10.3 There is need to harmonize this global language of financials

> *Collect evaluative data and analyse it.* What is happening in this situation now as understood by the various participants? Using research methods, what can we find out about it?

#### 4.10.3.1 Budgets/Forecasts

I looked to the IMF initially, to see how their fiscal and global monitoring was managed. I did a short online course funded by the IMF and World Bank in how to use their excel-based Public Debt Dynamics Tool (DDT) which uses circa 10 macroeconomic and financial variables. The objectives: you would be able to 'recognise key concepts for public debt projections, use simple calculations to project public debt, identify the effects of exchange rate changes on the public debt stock, understand how to project the public debt to Gross Domestic Product (GDP) ratio'. I completed the course. It was an excel tool not AI augmented but I was interested to learn that the IMF modelled out up to 10 years in advance using it and stress testing.612 Was their tool available for me to use and to input country financial data rather than the data of a mythical country 'Macroland'? Or was it restricted to certain cohorts? I wrote to the IMF on 19 November 2021, to see if having

612 IMF, and World Bank., (2021), Projecting Public Debt – the Public Debt Dynamics Tool. Online course published on EdEx USA by the IMF Institute for Capacity Development and World Bank Debt Management Facility, and is available on, Available at https://www.edx.org/course/projecting-public-debt-the-public-debt-dynamics-tool. (Accessed 21 November 2019) Course completed passed on 19 November 2021)

completed the course, I could download a copy of their tool for use with country specific data. No response was received.

I next checked the Fiscal Model in Ireland, Casey, E., and Purdue, D., (2021) noted "Maq" the macro-fiscal model for Ireland draws on the comprehensive research by the IMF on historical fiscal shocks, also noting that the model is primarily inspired by OECD fiscal modelling with a detailed interest model added, also incorporating the work by the Fiscal Council (Ireland) on potential output and Irish-specific fiscal multipliers.613

It had been emailed to me at work so that I could use this for modelling as could everyone else involved in Public Policy, looking to stress test or model the impact of certain steps. It is also available publicly.614

613 Casey, Eddie., and Purdue, David., (2021) A Macro-Fiscal Model for Ireland. Pages 1, 2 and 3. Published by Casey, Eddie., Purdue, David. On the Irish Fiscal Advisory Council, Dublin, Ireland website available at https://www.fiscalcouncil.ie/maq-a-macro-fiscal-model-for-ireland/ (accessed 21 November 2021) [The report states the authors are the Chief Economist and Head of Secretariat at the Irish Fiscal Advisory Council and a Senior Economist at the National Treasury Management Agency and the opinions are their own.

614 Irish Fiscal Advisory Council (2021), Fiscal Space Calculator, Published by the Irish Fiscal Advisory Council, Dublin, Ireland available at https://www.fiscalcouncil.ie/fiscal-space-calculator/

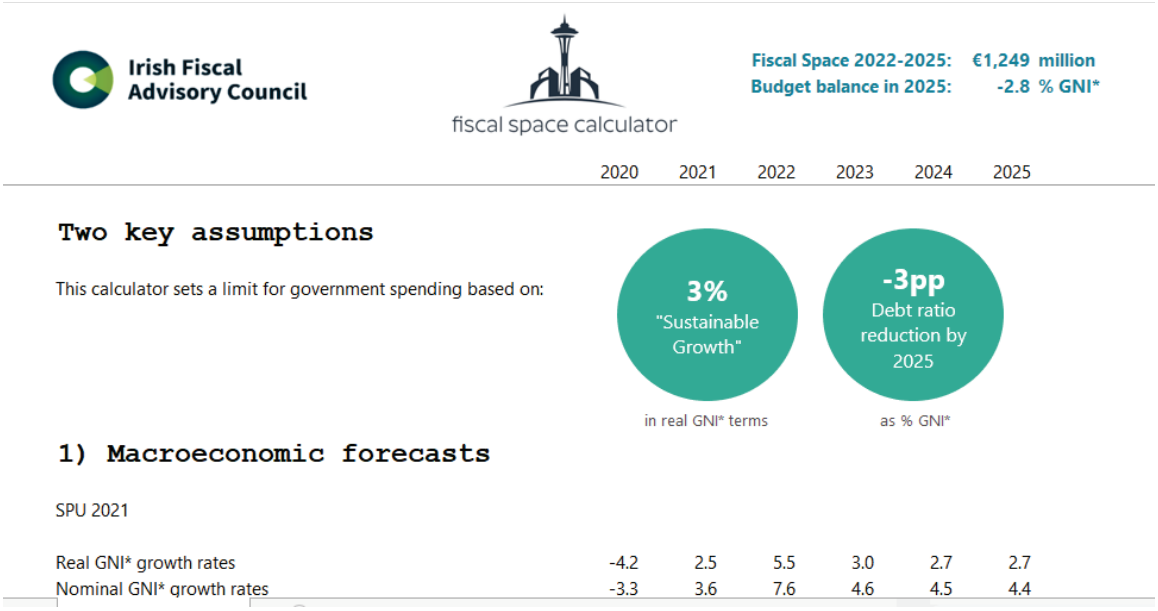


**Figure 4.56 Irish Fiscal Advisory Council, Fiscal Space Calculator (2021)**

It models out movement in fiscal space projections from 2020 to 2025 in an environment where multi-annual capital and current budgets are available to develop detailed forecasts and we also have Project Ireland 2040 projections to 2040 and other fiscal projections available through the IMF. I could not see the data used to calculate the initial fiscal space. I enquired about same by email on 22 November 2021. I wanted to reference the opening figures into the actual financial datasets. The Fiscal Calculator is on excel.

The Irish Fiscal Advisory Council representative, responded by email on 25 November 2021.

> "The starting fiscal space figure relies on the corrected expenditure aggregate – an underlying measure of general government expenditure that we regularly derive using CSO data. This figure is then grown by the assumed potential growth rate + inflation to derive an allowed starting fiscal space.
>
> On your suggestion, thanks for this. I'm not sure how it would work to be honest. It seems like a big extension to develop an appraisal model from the fiscal space

calculator, and I don't think there is any obvious overlap with the exercise it currently performs.

They used CSO data. I'd like to have been provided with the data they'd used to derive their figures. I wondered if that data was the same as the IMF data used for the County report projections and whether it would be beneficial to model further and to use AI.

#### 4.10.3.2 Financial Statements and Financial Reporting

In public sector, annual and multi-annual expenditure needs, existing and future borrowing requirements, and fiscal space, determine the level of taxes levied on the citizen, in local government, central government, and the EU where the budget is set out in longer term multi-annual budgets, forecasting expenditure. The European Commission (2021). noted the EU budget is financed from the following sources

- a proportion of each country's gross national income (GNI) in line with how wealthy they are
- customs duties on imports from outside the EU
- a small part of the value added tax collected by each EU country
- starting in 2021, a contribution based on the amount of non-recycled plastic packaging waste in each country
- other revenue, including contributions from non-EU countries to certain programmes, interest on late payments and fines, as well as any surplus from the previous year
- To finance NextGenerationEU, the European Commission will raise funds on the capital which will be repaid over a long period until 2058.615

615 European Commission., (2021). Revenue https://european-union.europa.eu/institutions-law-budget/budget/revenue_en (accessed 21 November 2021)

Budget preparation can be a lengthy and somewhat painful manual process, as is the closing off year-end financial statements and preparation of year end accounts which can take weeks and is prone to error. And if you are a member of the public seeking to use audited financial statements of the public sector in Ireland you can be waiting anytime between three months after the year end for the draft financial statements and up to ten months later for audited financial statements. This is not really a satisfactory state.

There is a lot of public sector data available but there isn't a real-time, continuous accounting or continuous reporting facility. I hadn't seen anything linking the Project Ireland 2040 expenditure projections into budgets to model out more than three years. I had also noted contradictions between financial data on the Project Ireland 2040 database and the PPP database of the Irish Government, in relation to specific PPP projects. The PPP database provided expenditure information and the Project Ireland 2040 database stated 'commercially sensitive' in relation to the same projects. I looked at more PPP data in Ireland and noted other contradictions too as set out below in the table. All data used in the table below is in the public domain.

| **All PPPs** | **PPPs** | | | **Concessions** | | | **Total** | |
|---|---|---|---|---|---|---|---|---|
| | **Number** | **Contracted Value €million** | **Total projected cost** | **Number** | **Contracted Value €million** | **Total projected cost** | **Number** | **Total Project Cost €million** |
| CSO **April 2021** | Not stated | 4,033 | ? | Not stated | 1,5576 | ? | Not stated | 5,990 |
| OC+AG **Dec 2020** | | 6,732 | | | | | | 6,732 |
| NDFA PPP list **Dec 2020** | 22 | 3,559.2 | 9,920.1 | 9 | 1,892.3 | 1,037.6 | 31 | 10,957.7 |
| DPER PPP: 2 Motorway Service Areas no financials 1 completed 2010 one in 2019 | | | | | | | | |
| DPER PI-2040 **Dec 2020** | 17 | 11 commercially sensitive | | 0 | 0 | | 17 | 11 commercially sensitive |
| EU 2000 to **2014** | 3 | 1,125 | | 0 | 0 | | 3 | 1,125 |
| EU grant element 81m across all 3 PPPs. 2 PPPs are ICT and are not recorded as PPPs in Ireland | | | | | | | | |
| NDP 2018 **Dec 2017** | Not stated | ? | 7,185 | Not stated | ? | 2,415 | ? | 9,600 |
| NDP PPP No list in NDP report. No mention of Water PPPs 2017 seems incorrect see below. | | | | | | | | |
| PBO Dec **2016** | 19 | 3,080.7 | 8,596.6 | 8 | 1,865.9 | 1,039 | 27 | 9,635.6 |
| PBO report states **2016** also states the PPP list excludes Water PPPs available via **PQ 841 of 2013**. Not located. | | | | | | | | |
| OC+AG **Dec 2016** | 19 | 3,080.8 | 8,596.6 | 7 | 1,520 | 1,039 | 26 | 9,635.6 |
| Water PPPs excluded. DCC waste to energy Coventa €346k not on concessions schedule. | | | | | | | | |

**Table 4.23 PPP data relating to Ireland in the Public Domain is contradictory. Data sources in the public domain complied by Marita Gonsalves September 2021 (Internal Report unpublished)**

A lot of good work is being done. A lot of effort being made in transparency terms. But all with outdated data. All with outdated modes of financial reporting and highlights the need for and benefit of continuous accounting and reporting. I had noted that Oracle had declared they could, through their cloud financials service produce a one day close and model up to 10 years ahead. This was closer to the EU model and the IMF Fiscal Model and the Irish Fiscal Advisory Council use of multi-annual budget projections. I thought to

check this out. I reached out to Oracle through Chartered Accountants Ireland. Oracle asked how they could help. I outlined what I wanted to trial actuals into forecast. No response**.**

I had learned at a Chartered Accountants Ireland conference that Oracle were emphasising AI augmented forecasts, and continuous accounting, and one day year end close so I thought to trial this using a Department Oracle licence because I previously held a licence in my former budget approver role. I thought there might be benefit for the national Financial Management Shared Services project. This project is controversial. It has experienced delays and cost overruns. McQuinn, C., (2021) of the Irish Times, a national newspaper reported as follows:616

> "A delayed financial management system for the Government that has seen costs spiral is expected to meet the revised target budget of €115 million, the Dáil's public spending watchdog has been told.
>
> The new Financial Management Shared Services (FMSS) project was expected to cost about €54 million, including VAT, and was due to begin its rollout in 2018.
> The Government last year approved a new budget of €115 million – also inclusive of VAT – for what is being described as an enhanced project with a completion date of 2025.
> …
> …chief executive of the National Shared Services Office, the agency overseeing FMSS, defended the project during an appearance at the Public Accounts Committee on Tuesday.
>
> The goal of the FMSS project is to replace 31 disparate financial reporting systems across 48 Government departments and offices with a single financial management system."

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616 McQuinn, Cormac., The Irish Times, (2021) Revised €115m financial project on course to come in on budget, PAC told. Pghs 1, 2, 3 and 5. Published by McQuinn, Cormac., The Irish Times, Dublin, Ireland available at

https://www.irishtimes.com/news/politics/revised-115m-financial-project-on-course-to-come-in-on-budget-pac-told-1.4486921 (accessed 29 November 2021)

Many citizens do not read Public Account Committee (PAC) (the Dáil's public spending watchdog) briefings even though they are all online. But they read newspapers.

The National Shared Services Office (NSSO), Murphy, H., (2021), provided a comprehensive briefing to the Public Accounts Committee (PAC) noting, "The Financial Management Shared Services will implement a single common chart of accounts and standardised accounting processes for all of Central Government and see the migration of 31 separate financial management systems to a single integrated system" also noting the "transformative changes to be delivered through this programme" which "will address existing legacy system issues eliminating significant manual effort required to meeting reporting requirements and positioning the Government to be responsive to evolving national and international fiscal transparency in the medium to long term"

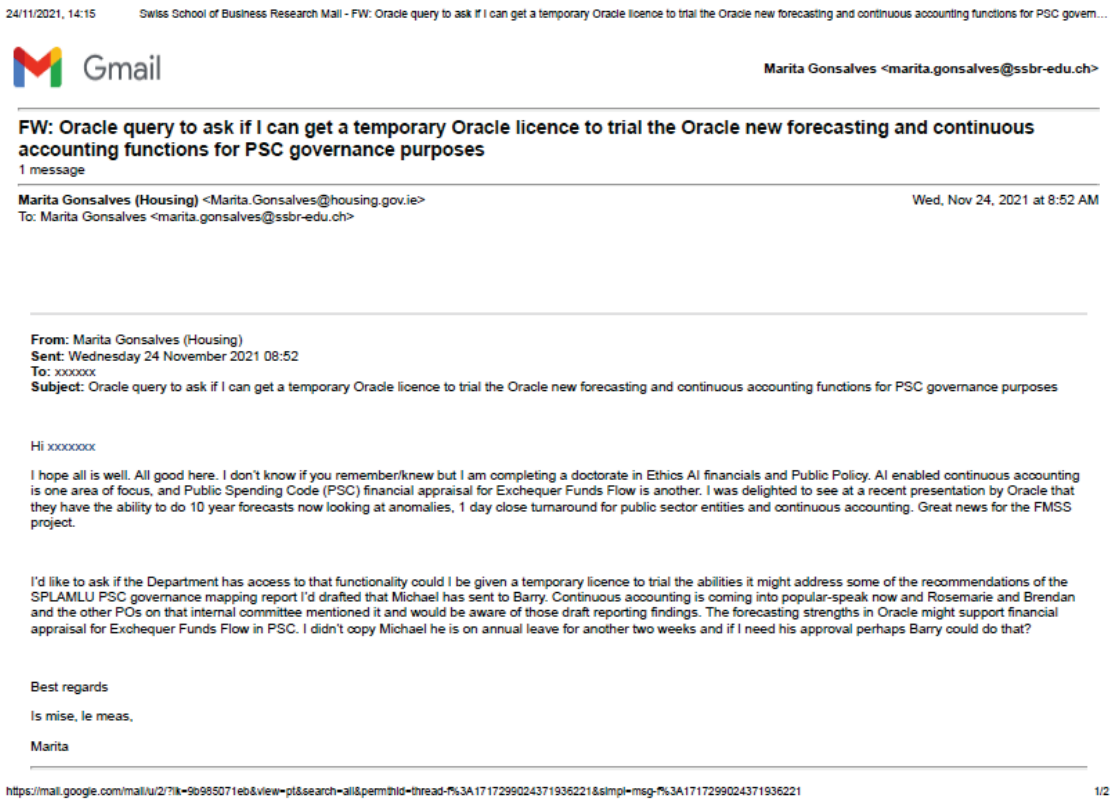
Emphasising that:

> "The existing distribution of financial processing across the Central Government Public Service Bodies (PSBs), and across multiple systems, does not support the automated consolidation of data at a central level, nor can it meet existing and emerging reporting requirements without considerable duplication of effort and at a potentially significant cost/risk to the State"

It is an incredibly important system for Government "the continued investment will also support the central delivery of accruals-based accounting, and the central management of e-invoicing, data and cyber security for our Central Government finance system, which accounts for more than €70 billion in expenditure per annum." 617 My department sent

617 Ireland, Houses of the Oireachtas, National Shared Service Office (NSSO), Hilary Murphy, NSSO., (2021), National Shared Services Office Advanced Briefing Committee of Public Accounts February 2021, R0353 (ii) PAC33 Pages 112-15 See **Appendix K**. Published by the NSSO, Dublin, Ireland available at https://data.oireachtas.ie/ie/oireachtas/committee/dail/33/committee_of_public_accounts/

me an email request on 29 November 2021 to forward a junior member of staff the presentation, noting 'if needed' in the email.



24/11/2021, 14:15 Swiss School of Business Research Mail - FW: Oracle query to ask if I can get a temporary Oracle licence to trial the Oracle new forecasting and continuous accounting functions for PSC govern...

Gmail

Marita Gonsalves <marita.gonsalves@ssbr-edu.ch>

**FW: Oracle query to ask if I can get a temporary Oracle licence to trial the Oracle new forecasting and continuous accounting functions for PSC governance purposes**

1 message

**Marita Gonsalves (Housing)** <Marita.Gonsalves@housing.gov.ie> Wed, Nov 24, 2021 at 8:52 AM
To: Marita Gonsalves <marita.gonsalves@ssbr-edu.ch>

**From:** Marita Gonsalves (Housing)
**Sent:** Wednesday 24 November 2021 08:52
**To:** xxxxxx
**Subject:** Oracle query to ask if I can get a temporary Oracle licence to trial the Oracle new forecasting and continuous accounting functions for PSC governance purposes

Hi xxxxxxx

I hope all is well. All good here. I don't know if you remember/knew but I am completing a doctorate in Ethics AI financials and Public Policy. AI enabled continuous accounting is one area of focus, and Public Spending Code (PSC) financial appraisal for Exchequer Funds Flow is another. I was delighted to see at a recent presentation by Oracle that they have the ability to do 10 year forecasts now looking at anomalies, 1 day close turnaround for public sector entities and continuous accounting. Great news for the FMSS project.

I'd like to ask if the Department has access to that functionality could I be given a temporary licence to trial the abilities it might address some of the recommendations of the SPLAMLU PSC governance mapping report I'd drafted that Michael has sent to Barry. Continuous accounting is coming into popular-speak now and Rosemarie and Brendan and the other POs on that internal committee mentioned it and would be aware of those draft reporting findings. The forecasting strengths in Oracle might support financial appraisal for Exchequer Funds Flow in PSC. I didn't copy Michael he is on annual leave for another two weeks and if I need his approval perhaps Barry could do that?

Best regards

Is mise, le meas,

Marita

https://mail.google.com/mail/u/2/?ik=9b985071eb&view=pt&search=all&permthid=thread-f%3A1717299024371936221&simpl=msg-f%3A1717299024371936221 1/2

**Figure 4.57 Marita Gonsalves request internally, requesting a temporary licence allocation to trial the AI forecasting and continuous accounting elements in Oracle made 24 November 2021**

The OG&AG (2019) report on implementation of the financial management shared services (FMSS) project, noting that the project is expected to 'facilitate fiscal transparency' and 'could deliver other benefits' … 'including cyber and data security and

submissions/2021/2021-04-16_briefing-document-hilary-murphy-fagan-ceo-national-shared-services-office-r0353-pac33_en.pdf, (accessed 29 November 2021)

procurement management.' They note in the context of other shared services, that this project:

> "…envisaged the design and building of a whole new system to be deployed across the civil service. This has turned out to be significantly more challenging than originally envisaged. As a result, the project is very significantly behind the original schedule, and costs are likely to be very significantly in excess of the amount projected when the project first received Government approval in January 2016."

The OG&AG references the 2020 government decision which extends the project to '2025' and a revised 'total approved budget for the project' of '€115m including VAT',, they reference the FMSS solution provider (Oracle) and recommend, that the "NSSO "should ensure that the revised design specification satisfies the key requirements of the client base and will be capable of catering for known future requirements such as PPP (Public Private Partnership), the move to accrual accounting.[618] Technology functions listed do not include AI augmented forecasts, continuous accounting, fraud prevention anomaly detection, blockchain, RPA, or algorithmic government financials. An opportunity for advocacy today.

I also took out a 30-day free subscription to IBM Planning Analytics with Watson for Financial Planning and Analysis and sought to use this. But again, this was for 30 days and how could this help in the longer term?

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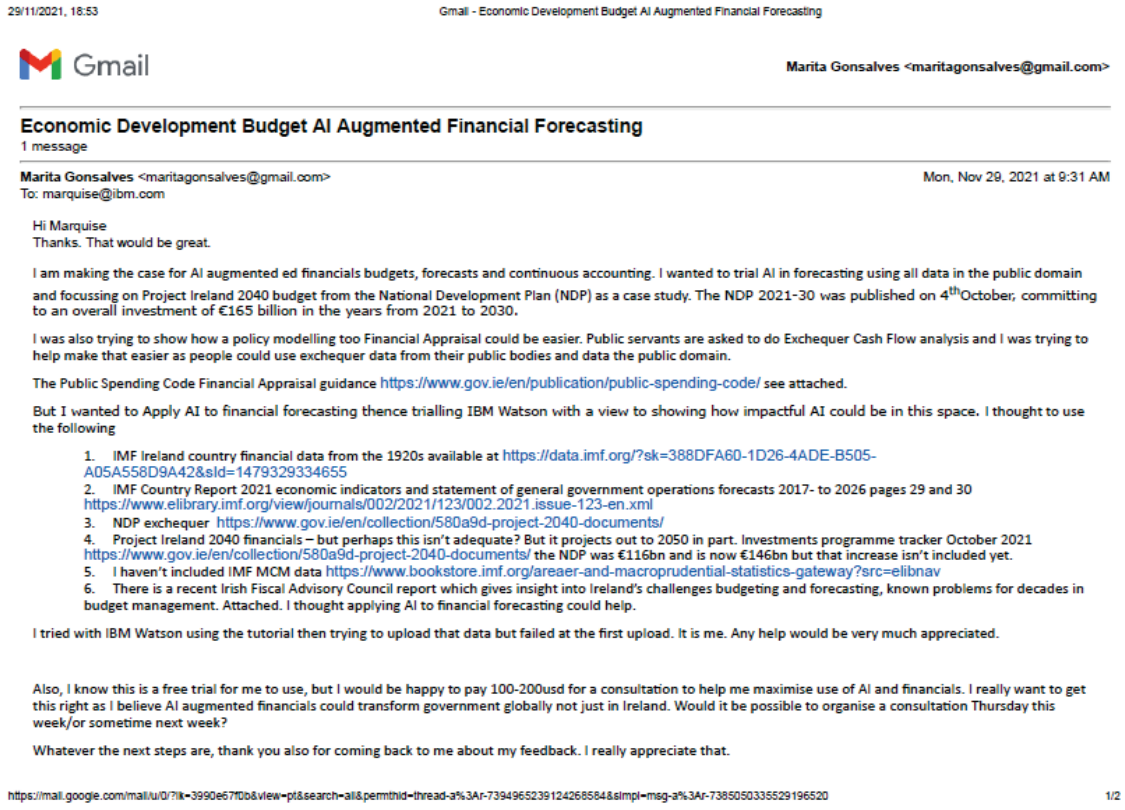
618 Office of the Comptroller and Auditor General, Ireland, (2019), Report on the Accounts of the Public Services, Chapter 5 Implementation of financial management shared services. Paragraphs 5.4, 5.59, 5.62, 5.64, 5.66 and Figure 5.6. Published by the OG&AG, Dublin, Ireland. Available at https://www.audit.gov.ie/en/find-report/publications/2020/2019-annual-report-chapter-5-implementation-of-financial-management-shared-services.pdf (accessed 16 February 2022)

I found this difficult to use and not oriented towards the public sector. I provided feedback noting same and IBM asked if I could outline the matters in greater detail which I did they offered to help so I sent them the following (all data in the public domain). I also offered to pay for a consultation as I really wanted to get this right.



29/11/2021, 18:53 Gmail - Economic Development Budget AI Augmented Financial Forecasting

Gmail

Marita Gonsalves <maritagonsalves@gmail.com>

**Economic Development Budget AI Augmented Financial Forecasting**

1 message

**Marita Gonsalves** <maritagonsalves@gmail.com> Mon, Nov 29, 2021 at 9:31 AM
To: marquise@ibm.com

Hi Marquise
Thanks. That would be great.

I am making the case for AI augmented ed financials budgets, forecasts and continuous accounting. I wanted to trial AI in forecasting using all data in the public domain and focussing on Project Ireland 2040 budget from the National Development Plan (NDP) as a case study. The NDP 2021-30 was published on 4th October, committing to an overall investment of €165 billion in the years from 2021 to 2030.

I was also trying to show how a policy modelling too Financial Appraisal could be easier. Public servants are asked to do Exchequer Cash Flow analysis and I was trying to help make that easier as people could use exchequer data from their public bodies and data the public domain.

The Public Spending Code Financial Appraisal guidance https://www.gov.ie/en/publication/public-spending-code/ see attached.

But I wanted to Apply AI to financial forecasting thence trialling IBM Watson with a view to showing how impactful AI could be in this space. I thought to use the following

1. IMF Ireland country financial data from the 1920s available at https://data.imf.org/?sk=388DFA60-1D26-4ADE-B505-A05A558D9A42&sId=1479329334655
2. IMF Country Report 2021 economic indicators and statement of general government operations forecasts 2017- to 2026 pages 29 and 30 https://www.elibrary.imf.org/view/journals/002/2021/123/002.2021.issue-123-en.xml
3. NDP exchequer https://www.gov.ie/en/collection/580a9d-project-2040-documents/
4. Project Ireland 2040 financials – but perhaps this isn't adequate? But it projects out to 2050 in part. Investments programme tracker October 2021 https://www.gov.ie/en/collection/580a9d-project-2040-documents/ the NDP was €116bn and is now €146bn but that increase isn't included yet.
5. I haven't included IMF MCM data https://www.bookstore.imf.org/areaer-and-macroprudential-statistics-gateway?src=elibnav
6. There is a recent Irish Fiscal Advisory Council report which gives insight into Ireland's challenges budgeting and forecasting, known problems for decades in budget management. Attached. I thought applying AI to financial forecasting could help.

I tried with IBM Watson using the tutorial then trying to upload that data but failed at the first upload. It is me. Any help would be very much appreciated.

Also, I know this is a free trial for me to use, but I would be happy to pay 100-200usd for a consultation to help me maximise use of AI and financials. I really want to get this right as I believe AI augmented financials could transform government globally not just in Ireland. Would it be possible to organise a consultation Thursday this week/or sometime next week?

Whatever the next steps are, thank you also for coming back to me about my feedback. I really appreciate that.

https://mail.google.com/mail/u/0/?ik=3990e67f0b&view=pt&search=all&permthid=thread-a%3Ar-7394965239124268584&simpl=msg-a%3Ar-7385050335529196520 1/2

**Figure 4.58 Marita Gonsalves request to IBM re AI augmented budgets help using their AI Planning Analytics budgeting and forecasting application.** Redact?

There was a positive outcome in that IBM discussed the matter with me and offered to develop a prototype.

#### 4.10.3.3 Fraud, Corruption, AML/CFT.

Public Sector has lots of guidance on Fraud, Corruption, Protected Disclosures, informative guidance, there are annual returns declarations for designated posts often linked to procurement. The Standards in Public Office (SIPO) Ireland undated document, "*Supporting Ethics Compliance Top 10 Practices for Public Bodies*" recommends practices for public bodies, including 'new appointee training' and 'regular refresher sessions for others on the provision of the Ethics Acts and on any relevant code of conduct".619

### 4.10.4 Global Financial Inclusiveness is key

*Review the data and look for contradictions.* What contradictions are there between what we would like to happen and what seems to happen?

619 Ireland, SIPO (undated) Top ten best practices for public bodies. Page 5 Practice 8 Conduct Training, Published by SIPO, Dublin, Ireland available at https://www.sipo.ie/acts-and-codes/guidelines/public-servants/Supporting-Ethics-Compliance-Top-Ten-Best-Practices-for-Public-Bodies.pdf (accessed 21 November 2021)
Note: The document is undated but references 2015 Acts.

#### 4.10.4.1Budgets/Forecasts

IBM contacted me about my feedback and asked me to provide further detail in relation to the difficulties which I did. They confirmed they didn't do paid consultations in that manner but on Thursday 03 December I met with three staff of IBM based in Canada, Texas who asked me about the problems and I explained the rationale for my approach also the reason I wanted to do this.620

I referenced my primary research, the Carnegie Council Leximancer findings in relation to the disconnect between AI and accounts, also DAOs.

I referenced Ireland's budget challenges and reform, including the OECD, IMF reports also newer reports including the DPER/EY capability assessment (2021) and the Irish Fiscal Advisory Council (2021) report.

Downes, R., and Nicol, S., OECD, (2015), Budget oversight by the Irish parliamentary chambers is under-developed by international standards. Many stakeholders and participants question whether the process is meaningful or impactful" roadmap of "proposals for continued reform for consideration by the Houses of the Oireachtas and other actors in the political system" is substantially implemented. Figure 4.22 outlines their proposal, and places emphases on continuous professional development of parliamentarians and officials as part of Budget Management and Scrutiny processes. 621

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620 I met with IBM Marquise Kamanke, William Pimeranto and Andrew Chaves on Thursday 02 December 2021 by VC.

621 Downes, Ronnie., DPER, Ireland, and Nicol, Scherie., OECD, (2015), Parliamentary Budget Review Highlights, Ireland. Page 6. Published by Downes, Ronnie., DPER, Ireland, and Nicol, Scherie., OECD, Paris, France. Available at https://www.oecd.org/gov/budgeting/Ireland-Highlights.pdf

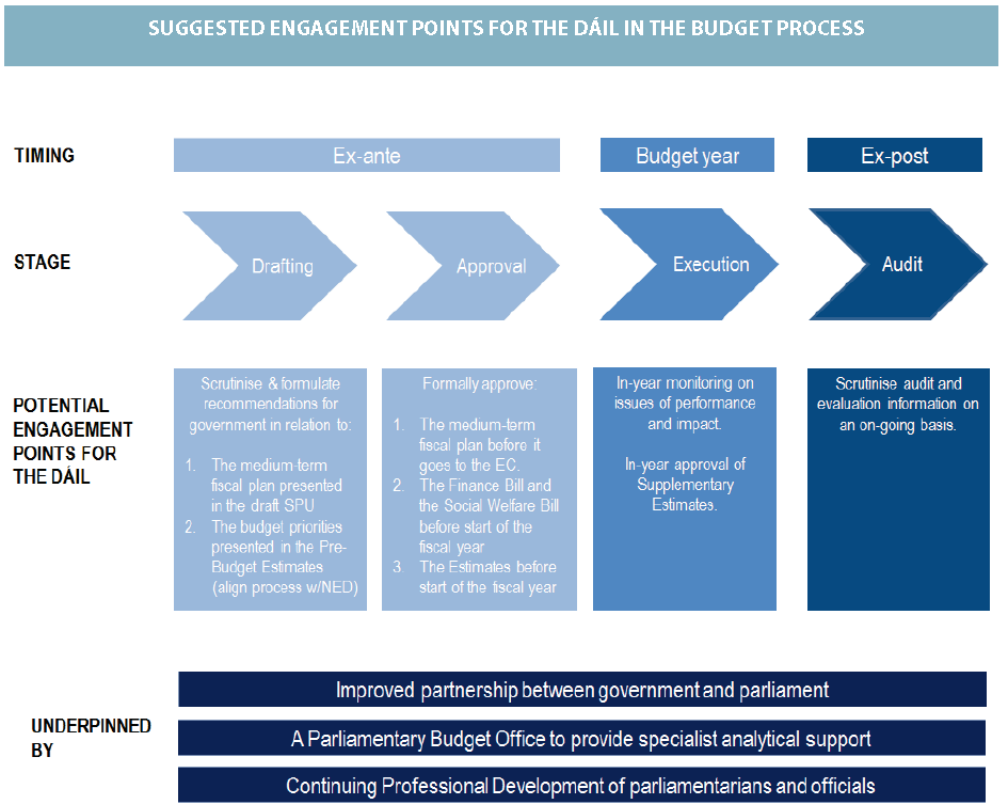



**Table 4.24 OCED, (2015) Suggested Engagement Points for the Dáil in the Budget Process. *Parliamentary Budgetary Review Highlights, Ireland.* AI can change financial planning and forecasts, supporting Parliamentarians and Officials in the annual budget cycle processes in Ireland**

Downes, R., and Nicol, S., OECD, (2016), observe, "Budget oversight by the Irish parliamentary chambers, the Houses of the Oireachtas, is under-developed by international standards. Many stakeholders and participants question whether the existing process is meaningful or impactful. Nevertheless, there is a strong momentum for reform with Ireland's public administration" and, also that "The increasingly multi-annual nature of budgeting, whereby governments give greater detail and clearer commitments on medium

term resource strategy, also provides opportunities for parliamentarians and other stakeholders to follow and influence the course of policy issues and impacts over a number of years."622

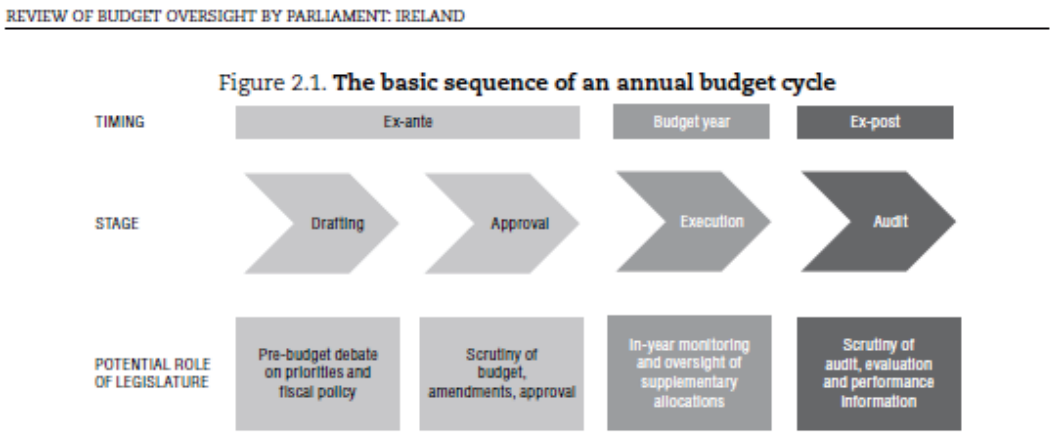



**Table 4.25 The annual budget cycle is, linked to an audit cycle. Downes, Ronnie., DPER, Ireland, and Nicol, Scherie., OECD, (2016), basis sequency of an annual budget cycle Ireland.**

As a Local Government Auditor, I also reviewed the Minister's approved budget confirming the proper notices of budget had been published in the newspapers and that the approved budget had been uploaded correctly into the relevant local authority's financial system. I'd noted one instance in my career where the proper legal procedures hadn't been followed, which meant that their budget was restricted to 80% and other matters. I'd

622 Downes, Ronnie., DPER, Ireland, and Nicol, Scherie., OECD, (2016), Public Governance and Territorial Development Directorate Budgeting and Public Expenditures Review of budget oversight by parliament: Ireland. Pages 65, 76 Published by Downes, Ronnie., DPER, Ireland, and Nicol, Scherie., OECD, Paris, France. Available at https://www.oecd.org/gov/budgeting/Review-of-budget-oversight-by-parliament-Ireland.pdf (accessed 02 December 2021)

discussed with my department and obtained legal advice in relation to same as it was later in the year and the advice had indicated that yes, the budget should be restricted but that it was highly unlikely that there would be legal challenge by a citizen, as it hadn't happened by then and therefore to report as I had done but not change the budget. Human error and potentially a very costly one for a local authority but highlighting the importance of scrutiny process, and of timely information and timely reporting. I didn't refer to this story at the meeting. I set out my argument to the IBM team stating the below in relation to budgets and forecasts.

There are rules for budgets annual and multi annual budgets and Ireland's budgets reference and approved by the European Union and reported in Ireland, in the EU and by the IMF. The IMF country reports make projection out up to 5 years. How are the budgets set? Budget allocations to budget holders are at overall capital budget and overall current budget figures, managed in a non-intelligent way, in that there is no artificial intelligence machine learning involved. There is a 'disconnect' between the budget and day-to-day management of budgets.

I'd noted again the disconnect with AI and accounts and that I felt it would be much easier if an AI budget forecast sourced from the entity's financial database, possibly based on the previous 5-year's expenditure was the opening point for discussion. The same approach could for multi-annual budgets, again affording the end user a very valid starting point, which would referenced back to actual expenditure patterns.

They were interested and I said I wanted to use Ireland as a case study not my own department, as I thought this would be applicable to all governments and entities if using IMF data or any audited data, noting that IMF GFSM is reconcilable to audit data. At the

meeting they asked me to email them the data I was using as they'd like to understand what was going wrong in my upload and when they saw the DPER data, IMF data, and the Project Ireland database they explained one of the issues in terms of columns, and parent child relationship.

I said I'd try again but they kindly offered to do a base prototype for me, noting it would be an interesting 'use case' to develop, that using audited data for the previous 5 years as a starting point for a budget/forecast was a good approach and that they would revert shortly with the prototype. They asked me to document in full my issues and take screenshots so that they could put in tool tips for future users. I confirmed I would do that. I met a second time and IBM showed me an early draft of their data structures and load files and template I emailed IBM 07 January 2022 to thank them, to state also I couldn't have developed that without them, therefore it was theirs, and that the data was all public domain data I had provided. I asked if they could consider providing such a template for the public sector globally to trial in Planning Analytics.

#### 4.10.3.2 Financial Statements and Financial Reporting

Our financial management needs harmonising, at its very foundation. Moretti, D., Nicol, S., Denise E., Youngberry, T., OECD., (2019), recommended "the Irish Government establish accrual financial statements compliant with international standards for its departments and offices" and also to "harmonise accounting standards used by entities within the general government sector".

> *"The report notes that accrual data would be a "building block" for richer, more reliable fiscal information, which would, in turn, help formulate improved assumptions for fiscal forecasts and be better equipped to identify fiscal risks. Beyond the adoption of accrual accounting, this report proposes that the Irish Government considers modernising its financial reporting framework by preparing integrated reports for departments and offices and consolidated financial statements. Integrated accounts for departments and offices would provide an overview of each department's resources and spending alongside information on their strategy and performance. This would enhance and improve scrutiny and examination of departmental performance by the Committee of Public Accounts and by the Oireachtas Sectoral Committee."*

The report notes "accrual data would be a building block for richer more reliable fiscal information" and provides analysis of the "legal groups' for revenue raising entities, including 40 public funds, exchequer funding, local authority revenue raising rights, representing same in diagram form below. *623*

623 Moretti, Delphine., Nicol, Scherie., Denise Emeline., Youngberry, Tim., OECD., (2019), Financial Reporting in Ireland. Pages 3, 7 and 15 Published by the OECD, Paris, France at https://www.oecd.org/gov/budgeting/Financial-reporting-in-Ireland-web.pdf (accessed 24 August 2021)

**Figure 2. Ireland: Building Blocks of General Government**

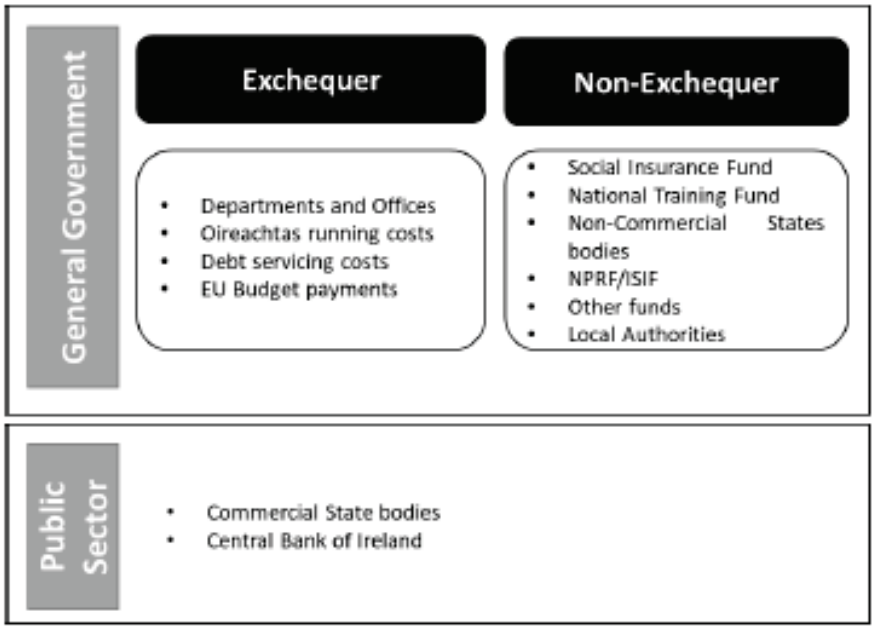
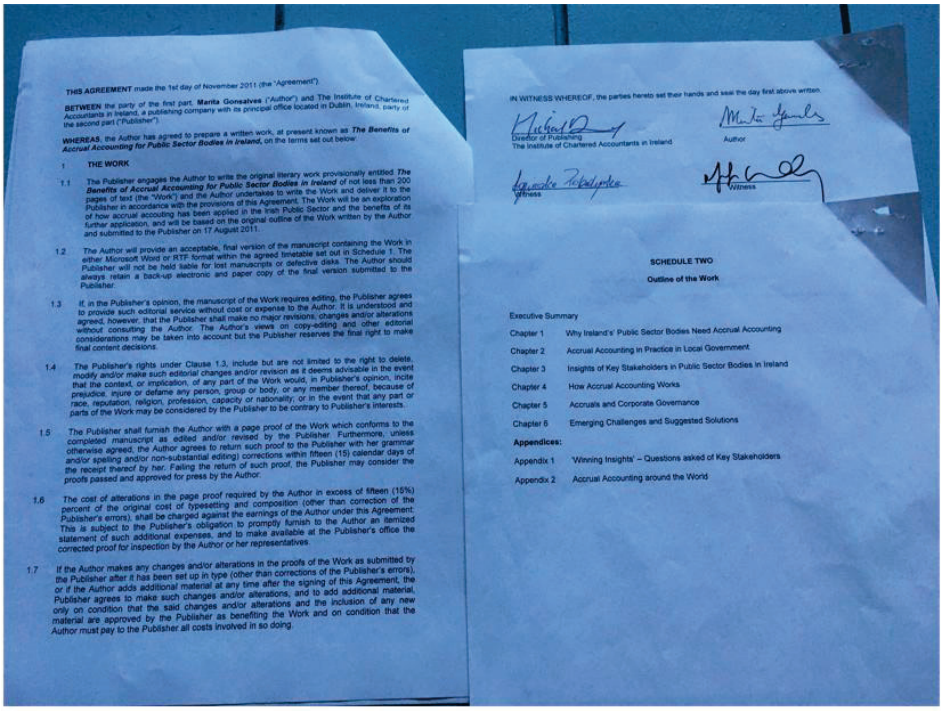



**Figure 4.59 Ireland Building Blocks of General Government, by Moretti, D., Nicol, S., Denise E., Youngberry, T., OECD., (2019),**

I was delighted with this, because as far back as 2011 I'd signed a publishing agreement with Chartered Accountants in Ireland having agreed the outline of my work as per the below figure. Much research had gone into that book including primary data collection through local authorities, the perspectives of staff who'd implemented introduction of accrual-basis accounting, which I'd advocated as important. It was pulled from publication in 2021 I was advised it was because it advocated IPSAS and EPSAS and was the opposite of the stated position of Chartered Accountants Ireland in relation to Public Sector and accrual-basis accounting, and that an advocacy piece was needed.



THIS AGREEMENT made the 1st day of November 2011 (the "Agreement").

BETWEEN the party of the first part, **Marita Gonsalves** ("Author") and The Institute of Chartered Accountants in Ireland, a publishing company with its principal office located in Dublin, Ireland, party of the second part ("Publisher").

WHEREAS, the Author has agreed to prepare a written work, at present known as ***The Benefits of Accrual Accounting for Public Sector Bodies in Ireland***, on the terms set out below:

1 THE WORK

1.1 The Publisher engages the Author to write the original literary work provisionally entitled ***The Benefits of Accrual Accounting for Public Sector Bodies in Ireland*** of not less than 200 pages of text (the "Work") and the Author undertakes to write the Work and deliver it to the Publisher in accordance with the provisions of this Agreement. The Work will be an exploration of how accrual accouting has been applied in the Irish Public Sector and the benefits of its further application, and will be based on the original outline of the Work written by the Author and submitted to the Publisher on 17 August 2011.

1.2 The Author will provide an acceptable, final version of the manuscript containing the Work in either Microsoft Word or RTF format within the agreed timetable set out in Schedule 1. The Publisher will not be held liable for lost manuscripts or defective disks. The Author should always retain a back-up electronic and paper copy of the final version submitted to the Publisher.

1.3 If, in the Publisher's opinion, the manuscript of the Work requires editing, the Publisher agrees to provide such editorial service without cost or expense to the Author. It is understood and agreed, however, that the Publisher shall make no major revisions, changes and/or alterations without consulting the Author. The Author's views on copy-editing and other editorial considerations may be taken into account but the Publisher reserves the final right to make final content decisions.

1.4 The Publisher's rights under Clause 1.3, include but are not limited to the right to delete, modify and/or make such editorial changes and/or revison as it deems advisable in the event that the context, or implication, of any part of the Work would, in Publisher's opinion, incite prejudice, injure or defame any person, group or body, or any member thereof, because of race, reputation, religion, profession, capacity or nationality, or in the event that any part or parts of the Work may be considered by the Publisher to be contrary to Publisher's interests.

1.5 The Publisher shall furnish the Author with a page proof of the Work which conforms to the completed manuscript as edited and/or revised by the Publisher. Furthermore, unless otherwise agreed, the Author agrees to return such proof to the Publisher with her grammar and/or spelling and/or non-substantial editing) corrections within fifteen (15) calendar days of the receipt thereof by her. Failing the return of such proof, the Publisher may consider the proofs passed and approved for press by the Author.

1.6 The cost of alterations in the page proof required by the Author in excess of fifteen (15%) percent of the original cost of typesetting and composition (other than correction of the Publisher's errors), shall be charged against the earnings of the Author under this Agreement. This is subject to the Publisher's obligation to promptly furnish to the Author an itemized statement of such additional expenses, and to make available at the Publisher's office the corrected proof for inspection by the Author or her representatives.

1.7 If the Author makes any changes and/or alterations in the proofs of the Work as submitted by the Publisher after it has been set up in type (other than corrections of the Publisher's errors), or if the Author adds additional material at any time after the signing of this Agreement, the Publisher agrees to make such changes and/or alterations, and to add additional material, only on condition that the said changes and/or alterations and the inclusion of any new material are approved by the Publisher as benefiting the Work and on condition that the Author must pay to the Publisher all costs involved in so doing.

IN WITNESS WHEREOF, the parties hereto set their hands and seal the day first above written.

Director of Publishing
The Institute of Chartered Accountants in Ireland

Author

Witness

Witness

**SCHEDULE TWO**

**Outline of the Work**

Executive Summary

Chapter 1 Why Ireland's' Public Sector Bodies Need Accrual Accounting

Chapter 2 Accrual Accounting in Practice in Local Government

Chapter 3 Insights of Key Stakeholders in Public Sector Bodies in Ireland

Chapter 4 How Accrual Accounting Works

Chapter 5 Accruals and Corporate Governance

Chapter 6 Emerging Challenges and Suggested Solutions

**Appendices:**

Appendix 1 'Winning Insights' – Questions asked of Key Stakeholders

Appendix 2 Accrual Accounting around the World

**Figure 4.60 Marita Gonsalves publishing agreement with Chartered Accountants Ireland dated 27 November 2011 for the book entitled "The benefits of accrual accounting for public sector bodies in Ireland"**

At that time, I'd noted the impact of the different accounting basis, but also that accounting standards were effectively written by Ireland and not always compliant with the International Standards. This is still true in 2021, for example, in 2019, the then updated Accounting Code of Practice and Accounting Regulations for Local Authorities in Ireland are written by a General Accounts Working Group and published by the Local Government Finance section of the Department of Environment, Community and Local Government see below published 31 January 2018.

# FOREWORD

This Accounting Code of Practice and Accounting Regulations for Local Authorities in Ireland is a Statement of Recommended Practice (SORP). SORP's provide recommendations for accounting and reporting, in particular, how accounting standards should be applied in the context of particular sectors and how to account for sector specific transactions. SORPs aim to provide consistency of accounting treatment within a particular sector.

The first ACOP was published in 1998 and has been revised in the subsequent years to reflect developments of an accounting nature. The General Accounts Working Group (GAWG) is responsible for developing new accounting policies, providing guidance on implementation, reviewing existing policies requiring amendment and addressing all issues relating to accounting policy.

A subgroup of the General Accounts Working Group was formed in late 2013 and tasked with the job of updating the Code to bring it in line with the international conceptual framework for accounting standards in 2014. The Financial Reporting Standard applicable in the UK and Republic of Ireland (FRS 102) extant at 31/12/2014 is the most up-to-date International Standard and is considered suitable for adoption within the local government sector. FRS 102 will replace extant Irish & UK GAAP accounting standards (SSAPs & FRSs) for accounting periods commencing on or after 1 January 2015. Early application is permitted for accounting periods ending on or after 31 December 2012.Therefore this code reflects where appropriate FRS102 and is effective for Annual Financial Statement (AFS) periods ending on or after 31/12/2014.

The policies outlined must be applied in the preparation of the AFS until such time as Ministerial direction is provided and/or the Code of Practice is updated. The ACOP encompasses Sections A and B, Appendices I to X, and the Departmental circulars issued and listed in Appendix V. The General Accounts Working Group (GAWG) is responsible for approving any updates to the ACOP and where necessary will obtain the endorsement of the Heads of Finance Group. Any updates to the ACOP will supersede previous versions. A copy of the updated Accounting Code of Practice is available on the DHPLG website www.housing.gov.ie

All ACOP queries and accounting policy requests should be directed to the Chair of the GAWG.

Local Government Finance

Department of Housing, Planning and Local Government

31 January 2018

**Figure 4.61 Department of Housing Local Government, Heritage, Ireland Local Authority Accounting in Ireland Code of Practice and Accounting Regulations (ACOP) of 31 January 2018, government website last updated July 2020**

The Local Authority Accounting Code of Practice and Accounting Regulations version, July in 2019, refers to the same Foreword and Departures. It is published on the old department of housing local government and heritage website and wasn't on the main

government website at the time I searched and checked again 06 December 2021.624 I'd noted that this Foreword was the same as the version published in December 2015 also.625

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**Local Government Finance**

**Department of Environment, Community and Local Government**

**23rd December 2015**

FOREWORD

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**Local Government Finance**

**Department of Housing, Planning and Local Government**

**31/7/2019**

**Figure 4.62 Department of Housing Local Government, Heritage, Ireland Local Authority Accounting in Ireland Code of Practice and Accounting Regulations (ACOP) of 31 December 2015 and of July 2019, government website last updated May 2020.**

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624 Department of Housing, Local Government and Heritage., (formerly Department of Housing, Planning and Local Government)., (2019), Local Authority Accounting in Ireland Code of Practice and Accounting Regulations Published July 2018, Pages 3, 8 and 59. Published by Department of Housing Local Government and Heritage, (formerly Department of Housing, Planning and Local Government)., Dublin, Ireland, available at, http://www.housing.old.gov.ie/sites/default/files/publications/files/accounting_code_of_practice_jul_2019.pdf .(accessed 06 December 2021)

625 Department of Housing, Local Government and Heritage., (formerly Department of Environment, Community and Local Government)., (2015) Local Authority Accounting in Ireland Code of Practice and Accounting Regulations Page 2. Published by Department of Housing Local Government and Heritage, Dublin, Ireland, available at, http://www.housing.old.gov.ie/sites/default/files/publications/files/accounting_code_of_practice_2015_1.pdf (accessed 06 December 2021)

The 2018 Code, states it "requires accounting policies to be applied consistently; • the overriding requirement is that the AFS 'presents fairly' the financial position and transactions of the local authority; and • where there are changes in accounting policies or where the requirements of the ACOP are not met, then full disclosure is required." It also states "The ACOP represents the minimum requirement for disclosure and presentation and is not intended to prejudice the provision of further information by authorities." The ACOP sets out the "local authority accounting code of practice departures from generally accepted accounting principles are outlined. These include: • Development Contributions • Assets, Capitalisation Account and Depreciation • Loan Charges • Transfers to Reserves • Post-Employment Benefits • Prior Period Adjustments • Related Parties • Subsidiary, Associate & Joint Venture Companies • Funds Flow."626

Transparency about the exclusions. To enhance fiscal transparency, government publishes revenue and expenditure estimates monthly for all sectors of general government for example in June 2020 the Department of Finance., (2021), stated that "The accounting basis for each subsector is included in the headings. The final three columns sum amounts on different accounting bases. Although this is unconventional, the intention is to give an indication of the impact of the transactions of each subsector of general government" and

626 Department of Housing, Local Government and Heritage., (formerly Department of Housing, Planning and Local Government)., (2018), Local Authority Accounting in Ireland Code of Practice and Accounting Regulations Pages 3, 8 and 59. Published by Department of Housing Local Government and Heritage, Dublin, Ireland, available at, https://www.gov.ie/en/publication/dd8fa-accounting-code-of-practice-january-2018/ (accessed 04 December 2021) [Published 31 January 2018. Website last updated 20 July 2020]

that “some of the data in this table is provisional and based on the best estimates up to this point. The table will be updated each month and quarter when better data is available

A role for AI augmented and a global harmonised language across each sector increasingly needed for all citizens.

Imagine AI RPA augmented financials and reports, continuous accounting and reporting using an international and globally harmonised accruals-basis accounting language. This is possible already and in place in the private and public sectors in other countries for example in the USA, today, and long overdue in Ireland. Adopting EU EPSAS, which come from the IFAC IPSAS will harmonise financial reporting and bring rigour to budgets, actual expenditure reporting, and public policy by augmenting PSC financial appraisal. I’d noted in that regard that DPER had indicated on 04 December 2021 that compliance with the local government accounting code of practice requirements “appears to be a policy issue so this is more of an issue for the Department of Housing Local Government and Heritage’. My advocacy hat was put on again and I contacted UIPath on 03 December 2021 to see how they could help with AI RPA Blockchain and Grants management also Financial Appraisal as I now had the data that I needed DPER having issued the new Financial Appraisal Templates in November 2021. In cycle 1 they’d offered to help with a Prove of Concept using the updated DPER PSC “Financial appraisal” guidance. I was hopeful between IBM Watson and UIPath that the AI ML RPA Blockchain concepts would progress. I didn’t hear back but also noted I hadn’t been able to take part in the RPA study course Q4 2021. This is an area for future continued advocacy.

Conroy, N., Casey, E. and Jordan-Doak., E. Irish Fiscal Advisory Council (2021), noted many Irish government projects with cost overruns referencing the national broadband plan and national children's hospital. They noted in terms of public capital stock that public land or buildings could "change in value due to revaluation by statisticians" that in relation to the NDP that "Ireland has had multi annual budgets for some time, designed to help plan capital spending programme" but that "in recent years these plans have tended to be revised frequently, often well before plans are due to expire" that "if Ireland is to avoid these problems in future and stick to realistic budgets for public investment spending, it will need to improve its systems of governance".627

Enter AI augmented financials, digital transformation, continuous accounting, reporting, blockchain, RPA usage in financials.

As highlighted DPER has produced a national financial appraisal guideline template, which is a very positive step however it stand-alone. can this not draw from financial systems and draw AI augmented financials to support the projections? If we want stakeholders to work with the Public Spending Code financial appraisal, it needs to be a system that is easier to use. AI continuous budgeting continuous expenditure analysis would enhance public policy improving the lives of all citizens by informing better budgets and spending patterns. This would also benefit AML/CFT practices and the ongoing risk of error or fraud.

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627 Conroy, N., Casey, E. and Jordan-Doak., E. Irish Fiscal Advisory Council (2021), "Ireland's next ramp up in public investment". Irish Fiscal Advisory Council Analytical Note Series No. 13. Pages 4, 8, 10, 39 and 41. Published by Conroy, N., E. Casey, and E. Jordan-Doak, Irish Fiscal Advisory Council, Dublin, Ireland Available at: https://www.fiscalcouncil.ie/wp-content/uploads/2021/11/Irelands-next-ramp-up-in-public-investment-Nov-2021.pdf (accessed 28 November 2021)

**4.10.3.4 Fraud, Corruption, AML/CFT.**

Public Sector has lots of guidance on Fraud, Corruption, Protected Disclosures, informative guidance, there are annual returns declarations for designated posts often linked to procurement, but there is no mandatory training for staff involved in budget preparation, budget management, expenditure approval, in the basics of financials. Most aren't accountants. Could education help? I also began to think about AML/CFT and got in touch with the Department of Finance AML/CFT section, initially about the national risk assessments, but at our virtual meeting 30 November I was advised that there might not be an updated public consultation on new technologies, so I outlined my research and the person made a request to be provided with the financial aml/cft elements of my research which I was happy to agree to pending confirmation by my tutor that I could do that at this stage. I was advised that they hadn't considered 'cryptocurrency for good' and that they would put me in touch with a relevant expert in the Department of Finance in the coming weeks. I had also shared the Carnegie Council ethics scenarios mentioning the AI DAO, in the context of risk and AI and accounts. I knew the Central Bank of Ireland, (2021), updated anti-money laundering and countering financing of terrorism guidelines for the financial sector state that "Firms should note that the CJA (Criminal Justice Act) 2010 is technology neutral with regard to the sources, which a Firm can use in order to comply with its CDD (Corporate due diligence) obligations under the CJA 2010. 628 I also discussed continuous

628 Central Bank of Ireland (2021) Anti-money laundering and countering financing of terrorism guidelines for the financial sector page 35. Published by the Central Bank , Dublin, Ireland available at https://www.centralbank.ie/docs/default-source/regulation/amld-/guidance/anti-money-laundering-and-countering-the-financing-

accounting and continuous forecasts the opportunities for AI ML RPA Blockchain in this financial space.

Ciancaglini, V., Gibson, C. and Sancho., D., Trend Micro Research McCarthy, O., and Eira, M., United Nations Inter-Regional Crime and Justice Research Institute (UNICRI) Amann, P., and Klayn, A., Europol (2021) reference 'development of new monetisation schemes for malicious use' providing an example from April2019 on blackhat.com where 'AI bots' were 'able to learn successful trading strategies from historic data and apply them to make better predictions on more profitable trades AI-supported Cryptocurrency Trading' and noting that 'cryptocurrency is a lucrative opportunity for financial gain by criminals',629

AI is the tool people determine its function. Or do they? Always? What about reinforcement learning? A question to consider. AI at the Helm.

See below example included in the report, "To illustrate, although AI-based tools for financial trading have been known for a while, the forum at blackhatworld[.]com

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of-terrorism-guidelines-for-the-financial-sector.pdf?sfvrsn=9 (Accessed 01 December 2021)

629 Vincenzo Ciancaglini, Craig Gibson, and David Sancho., Trend Micro Research Odhran McCarthy and Maria Eira, United Nations Inter-Regional Crime and Justice Research Institute (UNICRI), Centre for Artificial Intelligence and Robotics, and Philipp Amann, and Aglika Klayn, Europol European Cybercrime Centre (EC3)., (2021), *Malicious Uses and Abuses of Artificial Intelligence* Page 26. Published by Trend Micro Research Global, Irving, Texas USA; UNICRI New York, USA, and Europol, EC3, the Hague, Netherlands, available at https://www.europol.europa.eu/publications-documents/malicious-uses-and-abuses-of-artificial-intelligence (accessed 22 November 2021)

contains a reference to AI enabled bots that are specially dedicated to cryptocurrency trading".630

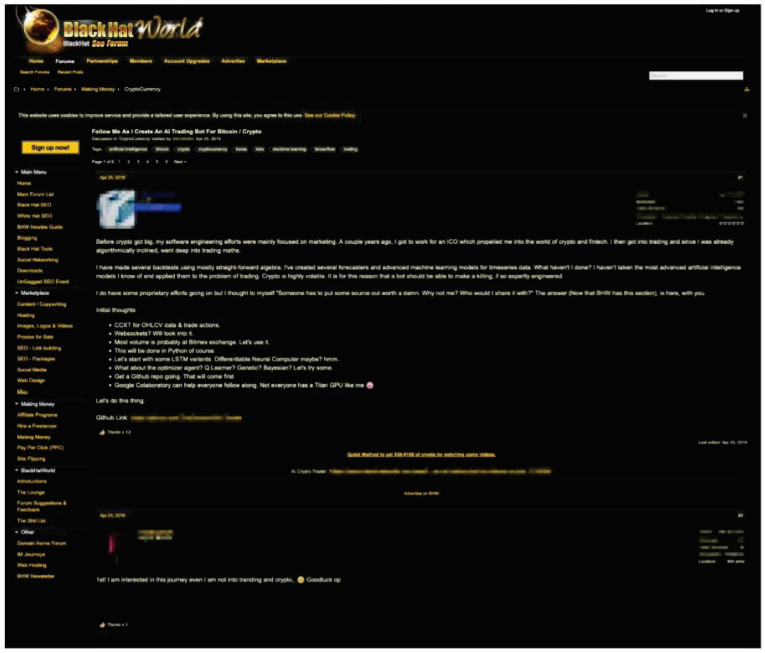


Figure 13. A discussion on AI bots for cryptocurrency trading

**Figure 4.63 Vincenzo Ciancaglini, Craig Gibson, and David Sancho., Trend Micro Research Odhran McCarthy and Maria Eira, United Nations Inter-Regional Crime and Justice Research Institute (UNICRI) Centre for Artificial Intelligence and Robotics Philipp Amann, and Aglika Klayn, Europol European Cybercrime Centre (EC3)., (2021), *Malicious Uses and Abuses of Artificial Intelligence* Page 26**.

630 Vincenzo Ciancaglini, Craig Gibson, and David Sancho., Trend Micro Research Odhran McCarthy and Maria Eira, United Nations Inter-Regional Crime and Justice Research Institute (UNICRI), Centre for Artificial Intelligence and Robotics, and Philipp Amann, and Aglika Klayn, Europol European Cybercrime Centre (EC3)., (2021), *Malicious Uses and Abuses of Artificial Intelligence* Page 26. Published by Trend Micro Research Global, Irving, Texas USA; UNICRI New York, USA, and Europol, EC3, the Hague, Netherlands, available at https://www.europol.europa.eu/publications-documents/malicious-uses-and-abuses-of-artificial-intelligence (accessed 22 November 2021)

The IMF (2021), identifies financial stability challenges for the Crypto Ecosystem including, integrity (market and AML/CFT), stability of Stablecoins, and, Macro-Financial challenges unclosing cryptoization, and bank disintermediation, also that "decentralized finance is gaining momentum", that "financial stability risks are not yet systemic but should be monitored" and observing that "policymakers should implement global standards for crypto assets and enhance their ability to monitor the crypto ecosystem by addressing data gaps."631

The World Economic Forum (2021) identify shared principles for an inclusive financial system in their August 2021 white paper, the '7 principles' are 'Inclusive by Design, Integrated System, Digitally-led, Economically Sustainable, Informed by Data, Trusted, Effectively Regulate'. The principles are 'created as a private sector-led set of principles with public sector input to guide cross-industry collaboration and public-private partnership in pursuit of an inclusive financial system' 'designed for all participants in financial ecosystems, including, policy-makers  regulators, traditional financial service providers, mobile money providers, fintech companies, adjacent technology providers, microfinance institutions, non-governmental organisations and international organisations'.632

631 IMF., (2021), Global Financial Stability Report, Covid-19, Crypto and Climate: Navigating Challenging Transitions Chapter 2 Page 41. Published by the IMF, Washington, USA. Available at https://www.elibrary.imf.org/view/books/082/465808-9781513595603-en/ch002.xml (accessed 28 November 2021) ISBN: 9781513595603 ISSN: 1729-701X

632 World Economic Forum (2021) Shared Principles for an Inclusive Financial System. Pages 4, 20 and 25. Published by the World Economic Forum, Colgony/Geneva,

> The principle: 'Informed by Data' mentioned Artificial Intelligence.
> While AI-powered products and services can provide solutions for information asymmetry and lower the cost of financial services to the last mile, it is important to minimize algorithmic bias and ensure adherence to ethical standards and governance frameworks that guarantee that the algorithmic solution is trustworthy, transparent, explainable, fair and just.

There was no reference to Cryptocurrency in the report. There was no reference to Blockchain for example in the context of grant management. What constitutes an 'Inclusive Financial System?

The UN eGovernment survey (2020) looks at how digital government can facilitate integrated policies and services across 193 UN Member States and supports countries' efforts to provide effective, accountable and inclusive digital services to all and to bridge the digital divide, leaving no-one behind. Artificial Initiatives referenced on the webpage include the use of cameras sensors and AI algorithms normally intended to control traffic, now measuring the distance between pedestrians to control social distance, also, a virtual doctor powered by AI in Croatia.633

AI continuous accounting and budgeting reporting integrated policies and services across 193 UN Member States would be a very powerful initiative.

The OECD, (2018) global competence framework identifies global competence as "the capacity to examine local, global and intercultural issues, to understand and appreciate the perspectives and world views of others, to engage in open, appropriate and effective

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Switzerland, available at https://www.weforum.org/whitepapers/shared-principles-for-an-inclusive-financial-system (accessed 22 November 2021)

633 UN (2020) e-Government survey website Published by the UN available at https://www.un.org/development/desa/publications/publication/2020-united-nations-e-government-survey (accessed 22 November 2021)

interactions, with people from different cultures, and to act for collective well-being and sustainable development." "Global competences assessment is through a cognitive assessment and background questionnaire. There is a lot in this assessment, but it is missing some areas, a focus on global Financials, there is no reference to financials accounting, budgets, actuals, or to fraud or corruption. Technologies impacts are identified in the context of 'economic interactions and interdependence, financial liberalisation, contagion and crisis; capital flow directions and instability; the emergence of global corporations; impacts of low-cost travel and shipping on local economic systems; technological investments and technology exchanges; wage differences and foreign investments; and the impact of job migration on countries.' Although the report speaks about 'policy-makers', it does not mention citizen consultation processes, their role as young public 'policy-makers'. Franchise is not mentioned (elections) and there is no mention of holding elected representatives to account. There is no reference to modern slavery.634

Dixon, W., and Balson, D., (2020) stated that 'more than 400 million people worldwide are victims of slavery' noting that AI can help as 'it can reveal trends in payments and help identify victims' for example, and that 'New Technologies can help reveal human trafficking, prosecute the traffickers and free those enslaved.' They note that 'Money paid to victims needs to be interdicted by the gangs, extracted and then laundered. This can be a weak point in which much is put on by governments and enterprises to detect abuse" and that "modern slavery relies on significant deception in acquiring legitimate

634 OECD, Directorate for Education and Skills, (2018), Preparing our youth for an inclusive and sustainable world. Pages 6, 11 and 47. Published by the OECD, Paris, France. Available at https://www.oecd.org/education/Global-competency-for-an-inclusive-world.pdf (accessed 22 November 2021)

enabling assets such as bank accounts, identity documents, and tax details." They reference legislation such as the Modern Slavery Act 2015 and the EU 6th Anti-Money Laundering Directive, noting that modern day slavery is a board-level issue. 635 Every financial number here telling a leadership story, including in the fight for human dignity and freedom.

### 4.10.5 Meet the Clerical Officer Accounting Technician Apprentice

> *Tackle a contradiction by introducing change.* By reflecting critically and creatively on the contradictions, what change can we introduce which we think is likely to be beneficial?

#### 4.10.5.1 Budgets, Forecasts, Financial Statements and Financial Reporting

"We have numbers in our DNA"[636]

A financial initiative I had sought to introduce in my department, which had commenced when I was Acting Head of ICT was an Accounting Technician

635 Dixon, William., and Balson, David., World Economic Forum, (2020) How AI can help combat modern slavery. Website. Published by the World Economic Forum available at https://www.weforum.org/agenda/2020/11/how-ai-can-help-combat-modern-slavery/ (accessed 22 November 2021)

636 Accounting Technicians Ireland (2022) We have Numbers in our DNA Membership 2020 brochure front cover. Published by Accounting Technicians Ireland, Dublin, Ireland available at: https://www.accountingtechniciansireland.ie/images/uploads/general/128910_2020_MEMBERSHIP_BROCHURE_V2_no_crops.pdf also main Website https://www.accountingtechniciansireland.ie/ (accessed 22 February 2022)

Apprenticeship for Clerical Officers. I introduced this prior to commencement of this doctorate. This was done with a view to building financial capacity. The management board supported this pilot and I reported on a regular basis in the first year. In the second year of the pilot Covid-19 struck and although the pilot continued, the focus moved in ICT to keeping the lights on and moving to and keeping everyone able to work remotely. I moved in August 2021 to the strategic policy with the apprentice. I would recommend this path to all Public Bodies as it is investing in administrative staff providing a useful qualification in financials which will always stand to them as their career progresses. The Revenue Commissioners at this stage are the only other public body with an Accounting Technician apprenticeship programme.

All Public Bodies should have an Accounting Technician Apprenticeship Programme. Investing in administrative staff providing a useful qualification in financials which will always stand to the Apprentices and Public Sector as their careers progress.

#### 4.10.5.2 Fraud, Corruption, AML/CFT.

I began to think again about fraud, corruption AML/CFT in the context of ethical leadership. I'd noted they are topics that cause disquiet when you raise them and in the first instance defensiveness because they didn't differentiate between discussing the risk and suggesting a possible reality. I began to wonder about how awareness raising could support colleagues managing finances but without formal qualifications. Budgets and actual expenditure management in need of approval. I researched information reported in the public domain in this area which they should be aware of to use. For example.

The Central Bank of Ireland (2021) references Enhanced Due Diligence (EDD) and politically exposed persons (PEP), identifying as one of the categories of PEP as a beneficial owner of a beneficiary (p45).

> Individuals who have or have had, a high political profile, or hold or have held, public office, or are currently performing or have performed a prescribed function (as determined by the Minister for Justice) can pose a higher money laundering risk to Firms as their position may make them vulnerable to corruption. This risk, and therefore EDD requirements for PEPs, also extends to members of their immediate families and to known close associates. Firms should note that PEP status itself is intended to apply higher vigilance to certain individuals and put those individuals that are customers or beneficial owners into a higher risk category. It is not intended to suggest that such individuals are involved in suspicious activity.637

The Central Bank (2021) Frequently Asked Questions Website (FAQ) stated in relation to the Beneficial Owners Register that Beneficial Owners can be beneficial owners through a shareholder agreement, or the exercise of dominant influence, or the power to appoint senior management, and who are noted as natural owners in the general definition, that in the context of Unit Trusts a beneficial owner is "a natural person" or the "trustee/settlor whether they are a natural person or a corporate entity.638 Could an AI Board on an AI DAO be a beneficial owner?

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637 Central Bank of Ireland (2021) Anti-money laundering and countering financing of terrorism guidelines for the financial sector (2021) Page 44. Published by the Central Bank of Ireland, Dublin, Ireland. Available at https://www.centralbank.ie/docs/default-source/regulation/amld-/guidance/anti-money-laundering-and-countering-the-financing-of-terrorism-guidelines-for-the-financial-sector.pdf?sfvrsn=9(Accessed 01 December 2021)

638 The Central Bank (2021) Anti-money laundering and countering financing of terrorism guidelines for the financial sector, Beneficial Ownership Register, Frequently Asked Website (FAQ) Published by the Central Bank , Dublin, Ireland available at https://www.centralbank.ie/regulation/anti-money-laundering-and-countering-the-financing-of-terrorism/beneficial-ownership-register/about-the-register-and-faqs (accessed 01 December 2021)

#### 4.10.6.1 Lessons Learned

*Monitor the change.* What happens day by day when the change is introduced?

Dick, B., (2000) states in respect of action research that "action research is true to label it pursues action and research outcomes it is most effective when the end result emerges from the data." Also stating that "differences between data sources used critically can then lead the researchers, and the participants, towards a deeper and more accurate understanding. Literature can be such an alternative data source."639 I learned so much from these data sources.

Audited financial data over a period of years, which shows the actual expenditure pattern, should influence the next year and the next multi annual budgets. The data exists on our financial ledgers is not translating into the day-to-day budgetary practices. How can AI ML RPA Blockchain help? For example, with financials and budget forecasts.

There are rules for budgets annual and multi annual budgets and Ireland's budgets reference and approved by the European Union and reported in Ireland, in the EU and by the IMF. The IMF country reports make projection out up to 5 years. How are the budgets set? Budget allocations to budget holders are at overall capital budget and overall current budget figures, managed in a non-intelligent way, in that there is no artificial intelligence machine learning involved. There is a 'disconnect' between the budget and day-to-day

639 Dick Bob., Passfield, Ron., and Wildman, Paul., (2000) A Beginners Guide to Action Research (online) Section 'Good Action Research, Paragraph 14. Published by Dick Bob., Passfield, Ron., and Wildman, Paul., Aral.com, Australia. http://www.aral.com.au/resources/guide.html (accessed on 06 December 2021)

Note: See also the site homepage http://www.aral.com.au/arhome.html (accessed 01 March 2021)

management of budgets. Staff with little or no training in financial management given capital and current budget of millions, asked to allocate the budget over the year and monitor fortnightly. I have seen these budgets divided by 12, divided into quarters, all put to the end of the year, sometimes staff try to align with known expenditure patterns e.g. contract management or if they know about upcoming requests for exchequer funding in a Department or delivery of projects and programmes in other areas such as Local Government. Hybrid cash accounting in central government is also a challenge as there can be a rush to spend that budget rather than lose it. Budget holder charging to the wrong codes in capital and current where there is budget availability rather than advise centrally that have enough budget. It would be much easier if an AI budget forecast sourced from the entity's financial database, possibly based on the previous 5-year's expenditure as the opening point for discussion. The same approach could for multi-annual budgets, again affording the end user a very valid starting point, which would referenced back to actual expenditure patterns.

An AI augmented budget provided for staff and allowing staff to update it, in real time, as required, by the new information that was not in in the prior years' data bases.

There is also a history of calling capital and current expenditure to where there is budget space rather than actual capital our current and when it comes to bear and because it is hybrid cash accounting, money is spent perhaps in a way that does not represent the best value for money for the taxpayer. An AI enhanced system for a budget financial forecasting would really help in this space.

More can be done in the individual budget space with the advent of AI technologies, which would provide better financial data for the elected representatives, all stakeholders, and including all colleagues across public sector.

#### 4.10.7.1 Modelling Worldview Action research all Cycles

> *Analyse evaluative data about the change.* What is happening in this situation now – as understood by the various participants – as a result of the changes introduced? Using research methods what can we find out about it?

The IFAC (2021), emphasise the advocacy role fighting corruption and money laundering stating, "grounded in a strong ethical code, professional accountants across the globe play a critical role in the fight against corruption, bringing essential transparency relevance and integrity to the systems that underpin vibrant economies and making corruption less profitable and easier to prevent, detect and remedy."640 Building on this Friedrich, B., Friedrich L., IFAC IESBA, ICAS, and CPA Canada, (2021), ethics roundtable highlighted 4 themes, complexity and the professional accountant, technology is a double-edged sword, identifying and mitigating bias and mis-/disinformation and mindset and enabling skills and in this regard, the roundtable event noted that "a move fast and break things mentality can lead to dire unintended consequences for organisations in relation to disruptive technologies and related ethical implications" also that "professional accountants might serve organisations well by helping instill frameworks that help to slowdown decisions and ensure that the organisations ethics is not one of the things that gets broken while moving fast." Finally, noting "moral courage and a strong organisational culture are essential to ensure that concerns are aired and positively addressed."641

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640 IFAC., (2021), Fighting Corruption and Money Laundering. Webpage Paragraph 1 Published by the IFAC, New York, USA, available at https://www.ifac.org/what-we-do/speak-out-global-voice/points-view/fighting-corruption-and-money-laundering (accessed 07 December 2021)

641 Friedrich, Brian., and Friedrich Laura., IFAC IESBA, ICAS, and CPA Canada, (2021) Ethical Leadership in an Era of Complexity and Digital Change: Event Highlights. Webpage. Paragraphs 9 and 19. Published by Friedrich, Brian., and Friedrich Laura., IFAC

What does moral courage look like?

Serrat, O., of the Asian Development Bank, (2011) states "Moral courage is the strength to use ethical principles to do what one believes is right even though the result may not be to everyone's liking or could occasion personal loss. In organizations, some of the hardest decisions have ethical stakes: it is everyday moral courage that sets an organization and its members apart." Also, that moral courage is "the ability to act rightly in the face of discouragement or opposition, possibly and knowingly running the risk of adverse personal consequences." Observing that "beyond statements of corporate values, human resource divisions might also need to recruit for values and help spread the message that reinforcing these starts at the top. 642

What happens if values are tested, in the context of Financials? Are moral courage and organisational culture essential? There is nothing simple in moral courage. Loss of future promotion opportunities, loss of friends, colleagues, fear.... versus courage. What can we put in place to support? How can AI help? It is possible today, AI augmented budgets and forecasts, AI and continuous accounting, continuous reporting. AI supporting anti-fraud/ anti-corruption/ AML/CFT initiatives through financial interrogation. In terms

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IESBA, ICAS, and CPA Canada, available at https://www.ifac.org/knowledge-gateway/building-trust-ethics/discussion/ethical-leadership-era-complexity-and-digital-change-event-highlights (accessed 07 December 2021)

642 Serrat, O., Asian Development Bank., (2011), Moral Courage in Organisations. Pages 1 and 5. Published by Serrat, O., of the Asian Development Bank, Digital Commons LLR, Cornell University, New York USA, Researchgate.net, Berlin, Germany Available at https://www.researchgate.net/publication/254583225_Moral_Courage_in_Organizations (accessed 07 December 2021)

of an entity checking compliance with AML/CFT regulations. AI supports business being compliant.

**Figure 4.64 The Cube (2021) It's Raining Regs. Financial Crime and AML risk assessment https://www.cube.global/solutions/financial-crime-and-aml/**

Do values include emotional intelligence? Serrat, O., Asian Development Bank, (2011), states "Emotional Intelligence is values-free" that "without a moral anchor, the skills of emotional intelligence will not necessarily be directed toward doing good" noted in the context of observations about moral intelligence "from ethical challenge to action" also that by:

> "Marrying cognitive, technical, and emotional intelligence, only by repeatedly going through a process of analysis, interpretation, debate, and judgment

enlightened by ethics can people sharpen their skills in moral reasoning and in this manner develop moral intelligence." 643

And artificial EI positively reinforced. Marr, B., (2021) states in his blog

"When computers can read emotions by analyzing data, including facial expressions, gestures, tone of voice, force of keystrokes, and more to determine a person's emotional state and then react to it, we call this artificial emotional intelligence. This ability will allow humans and machines to interact in a much more natural way and very similar to how human-to-human interaction works." 644

Could AI determine if a person was being put under pressure about financials? Could AI could AI EI help understand and identify radicalisation? 645

I used an adaptation of the Business Model Canvas, tailored to Ethics, and adapted it further myself, and analyzed AI augmented financials in greater detail.

Mansfield, T., Dr. (2019) noted "the Business Model Canvas is a strategic management template that helps businesses to describe, design and analyse their business models." "The canvas was invented by Alex Osterwalder a Swiss business theorist and

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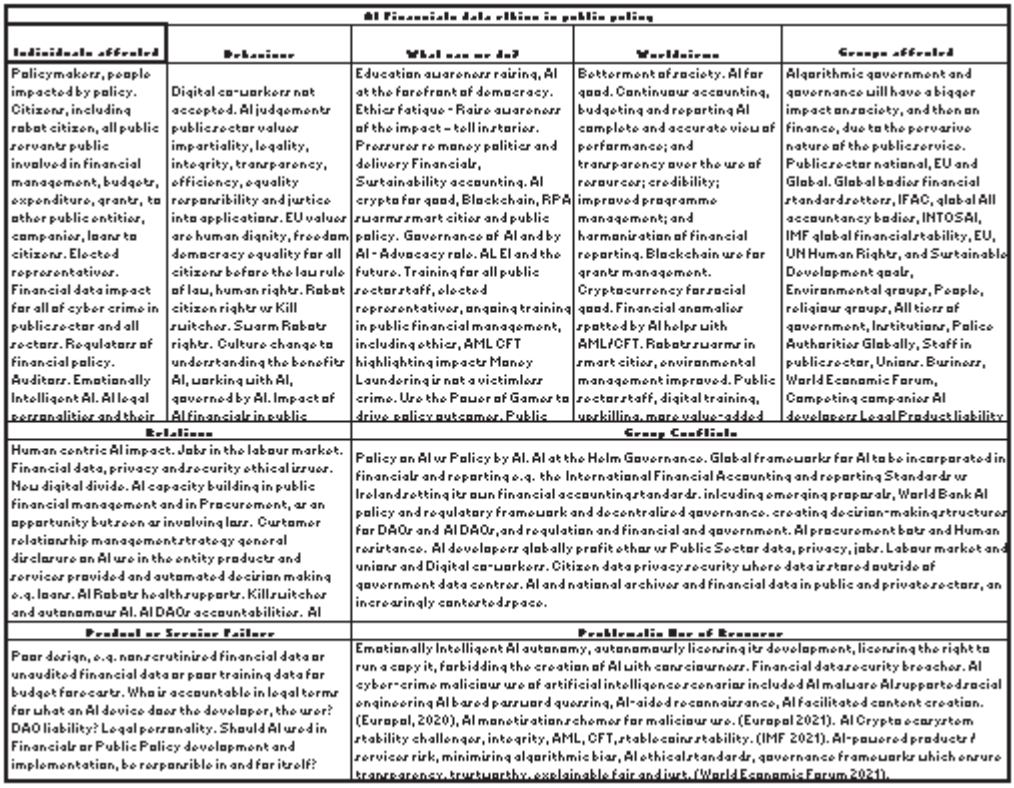
643 Serrat, O., of the Asian Development Bank., (2011), Moral Courage in Organisations. Page 5. Published by Serrat, O., of the Asian Development Bank, Cornell University, New York, USA; Researchgate.net, Berlin, Germany. Available at https://www.researchgate.net/publication/254583225_Moral_Courage_in_Organizations (accessed 07 December 2021)

644 Marr, Bernard., (2021), (2021), What is Artificial Emotional Intelligence? Blog by Bernard Marr available at https://bernardmarr.com/what-is-artificial-emotional-intelligence/ (accessed 07 December 2021)

645 Council of Europe., (2015), European Committee on Crime Problems Published by the Council of Europe, Strasbourg, France. Available at https://rm.coe.int/09000016806f398c (accessed 07 December 2021) [Commentary by Francesco Ragazzi, Scientific Expert to the Guidelines for Prison and Probation Services Regarding Radicalisation and Violent Extremism]

entrepreneur as a part of his PhD research."[646] I adapted the Osterwalder model using the Ethics Canvas freely downloadable from many of websites. I downloaded from Ethicscanvas.org (2020)[647].and further adapted to highlight the importance of Relations and Group Conflicts in this AI ethics space.



| AI Financials data ethics in public policy | | | | |
|---|---|---|---|---|
| **Individuals affected** | **Behaviour** | **What was we do?** | **Worldviews** | **Groups affected** |
| Policymakers, people impacted by policy. Citizens, including robot citizen, all public servants, public involved in financial management, budgets, expenditure, grants, to other public entities, companies, loans to citizens. Elected representatives. Financial data impact for all of cyber crime in public sector and all sectors. Regulators of financial policy. Auditors. Emotionally Intelligent AI. All legal personalities and their | Digital co-workers not accepted. AI judgements public sector values impartiality, legality, integrity, transparency, efficiency, equality responsibility and justice into applications. EU values are human dignity, freedom democracy equality for all citizens before the law rule of law, human rights. Robot citizen rights vs Kill switches. Swarm Robots rights. Culture change to understanding the benefits AI, working with AI, governed by AI. Impact of AI financials in public | Education awareness raising, AI at the forefront of democracy. Ethics fatigue - Raise awareness of the impact - tell instories. Pressures re money politics and delivery Financials, Sustainability accounting. AI crypto for good, Blockchain, RPA swarms smart cities and public policy. Governance of AI and by AI - Advocacy role. AI EI and the future. Training for all public sector staff, elected representatives, ongoing training in public financial management, including ethics, AML CFT highlighting impacts Money Laundering is not a victimless crime. Use the Power of Games to drive policy outcomes. Public | Betterment of society. AI for good. Continuous accounting, budgeting and reporting AI complete and accurate view of performance; and transparency over the use of resources; credibility; improved programme management; and harmonisation of financial reporting. Blockchain use for grants management. Cryptocurrency for social good. Financial anomalies spotted by AI helps with AML/CFT. Robots swarms in smart cities, environmental management improved. Public sector staff, digital training, upskilling, more value-added | Algorithmic government and governance will have a bigger impact on society, and then on finance, due to the pervasive nature of the public service. Public sector national, EU and Global. Global bodies financial standard setters, IFAC, global All accountancy bodies, INTOSAI, IMF global financial stability, EU, UN Human Rights, and Sustainable Development goals, Environmental groups, People, religious groups, All tiers of government, Institutions, Police Authorities Globally, Staff in public sector, Unions. Business, World Economic Forum, Competing companies AI developers Legal Product liability |
| **Relations** | **Group Conflicts** | | | |
| Human centric AI impact. Jobs in the labour market. Financial data, privacy and security ethical issues. New digital divide. AI capacity building in public financial management and in Procurement, as an opportunity but seen as involving loss. Customer relationship management strategy general disclosure on AI use in the entity products and services provided and automated decision making e.g. loans. AI Robots health supports. Kill switches and autonomous AI. AI DAOs accountabilities. AI | Policy on AI vs Policy by AI. AI at the Helm Governance. Global frameworks for AI to be incorporated in financials and reporting e.g. the International Financial Accounting and reporting Standards vs Ireland setting its own financial accounting standards. including emerging proposals, World Bank AI policy and regulatory framework and decentralised governance. creating decision-making structures for DAOs and AI DAOs, and regulation and financial and government. AI procurement bots and Human resistance. AI developers globally profit other vs Public Sector data, privacy, jobs. Labour market and unions and Digital co-workers. Citizen data privacy security where data is stored outside of government data centres. AI and national archives and financial data in public and private sectors, an increasingly contested space. | | | |
| **Product or Service Failure** | **Problematic Use of Resource** | | | |
| Poor design, e.g. non-scrutinised financial data or unaudited financial data or poor training data for budget forecasts. Who is accountable in legal terms for what an AI device does the developer, the user? DAO liability? Legal personality. Should AI used in Financials or Public Policy development and implementation, be responsible in and for itself? | Emotionally Intelligent AI autonomy, autonomously licensing its development, licensing the right to run a copy it, forbidding the creation of AI with consciousness. Financial data security breaches. AI cyber-crime malicious use of artificial intelligences scenarios included AI malware AI supported social engineering AI based password guessing, AI-aided reconnaissance, AI facilitated content creation. (Europol, 2020), AI monetisation schemes for malicious use. (Europol 2021). AI Crypto ecosystem stability challenges, integrity, AML, CFT, stablecoins stability. (IMF 2021). AI-powered products / services risk, minimising algorithmic bias, AI ethical standards, governance frameworks which ensure transparency, trustworthy, explainable fair and just. (World Economic Forum 2021). | | | |

**Figure 4.65: AI Financials data ethics in public policy, adaptation of the Business Model Canvas using PhD research data Marita Gonsalves**

646 Mansfield, Timothy., Dr., (2019) The Business Model Canvas. Paragraphs 1, 2, 11 Published by, Mansfield, Timothy.; Interaction Consortium Chippendale, Australia. available at https://interaction.net.au/articles/business-model-canvas-template/ (accessed 17 December 2021)

647 Ethicscanvas.org., (2020), Online Ethics Canvas available at https://www.ethicscanvas.org/ (accessed 17 December 2021) The website states the Ethics Canvas is adapted from Alex Oseerwalder's Business Model Canvas, and that the Business Model Canvas is designed by Business Model Foundry AG and used under a creative commons licence. I adapted their Ethics Canvas.

This made me think about the Engin., Zevnep., and Trelaven, P., (2018) Technology Stack, developments in the interim, ethics, financials, and AI citizen voice in government, realizing the vision, and I also adapted that technology stack for AI and associated technologies positioned in Government today, adding a further dimension, AI at the Helm.

| Ethical Algorithmic Government Today | | | | | |
|---|---|---|---|---|---|
| | AI in Government: Governance by AI AI at the Helm: | | | | |
| Artificial Intelligence Machine learning, Robotics, Swarm Robotics | AI Diplomat (China) | AI Government Policymaker | AI Software with Voting Rights on the Board | AI Board for Autonomous Entity DAO | AI EI Citizen, Robot Develops Public Policy |
| | AI in Government: Governance with AI | | | | |
| | Robo-advisors supporting Civil Servants | Robot-advisors supporting Public Service | Digital Co-workers | Decentralized Autonomous Companies (DAOs) | AI Accessibility Aids |
| | Drones and Swarms in environmental and emergency operations | Swarm Robotics AI Smart Cities | Swarm Robotics Procurement bots | Autonomous Vehicles | |
| | Space operations | Public Policy Modelling | Swarm Robotics Grant Management | AI use in Regulations Development | |
| | Behavioural/Predictive Analytics | Financial Data AI Forecasting | AI Archivist | Financial Data Continous Accounting and Reporting | |
| | Big Data Analytics | Financial Data Analytics | AI Financial Data anomaly detection AML/CFT | AI Reinforcement Learning | |
| | | | | | |
| AI and Blockchain Technologies | Digital identify & Citizen Record | Decentralized Finance | Gov Blocks Financial Inclusion Platform | Grants management | |
| | Blockchain DLT & Smart Contracts | P2P Energy Trading | Crises Fund Distribution | Cryptocurrency | |
| | Government Data Facilities (national public records) | Tokenized Funds Transfer | Banking including Bank Reconciliation | White Label Cryptocurrency Exchanges | |
| | Subsidy Distribution | Real estate tokenisation | Invoice discounting | Stable Coin | |
| | Cross Border Services e.g. EU EBSI | Land record management | AML/CFT detection overcoming money laundering | Ethical product mining tracking | |

**Figure 4.66: Ethical Algorithmic Government Today, adapted from the model Vision for a Future Algorithmic Government Technology Stack by Engin, Zevnep., and Trelaven, P., (2018) by Marita Gonsalves, (2021)**

**Step 8: Review and Change and decide what to do next: An advocacy role**

> *Review the change and decide what to do next.* Was the change worthwhile? Are we going to continue it in future? What are we going to do next? Is the change sufficient?

"If I hadn't believed it, I wouldn't have seen it" Helfferich, C., (1992), acknowledges the "paradigm shift", "the revolution in geology brought by the theory of plate tectonics" a change in "the basic world view in a scientific field"[648]. This research asked the question, how does an AI governance framework benefit public policy and has considered ethics, financials, new modes of governance. I found that the AI scenarios, storytelling helped consider the issues, the relationships and contributed to understanding of relationships and indeed, in the case of financials, a disconnect which needs to be addressed.

There is need to harmonize the global financial accounting and reporting frameworks for public financial management both internationally recognized and those which are local/country specific.

Bergmann, A., (2020), sets out details of "Internationally recognized Public Financial Management Standard Frameworks" see Figure 4.65 below.

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[648] Helfferich, Carla., (1992) Propulsion and Paradigms webpage, Paragraph 1 Published by Helfferich, Carla, University of Alaska Geophysical Institute, Fairbanks, USA, Alaska Science Forum, available at Propulsion and Paradigms | Geophysical Institute (alaska.edu) (accessed 18 December 2021) (webpage copyright 2020)

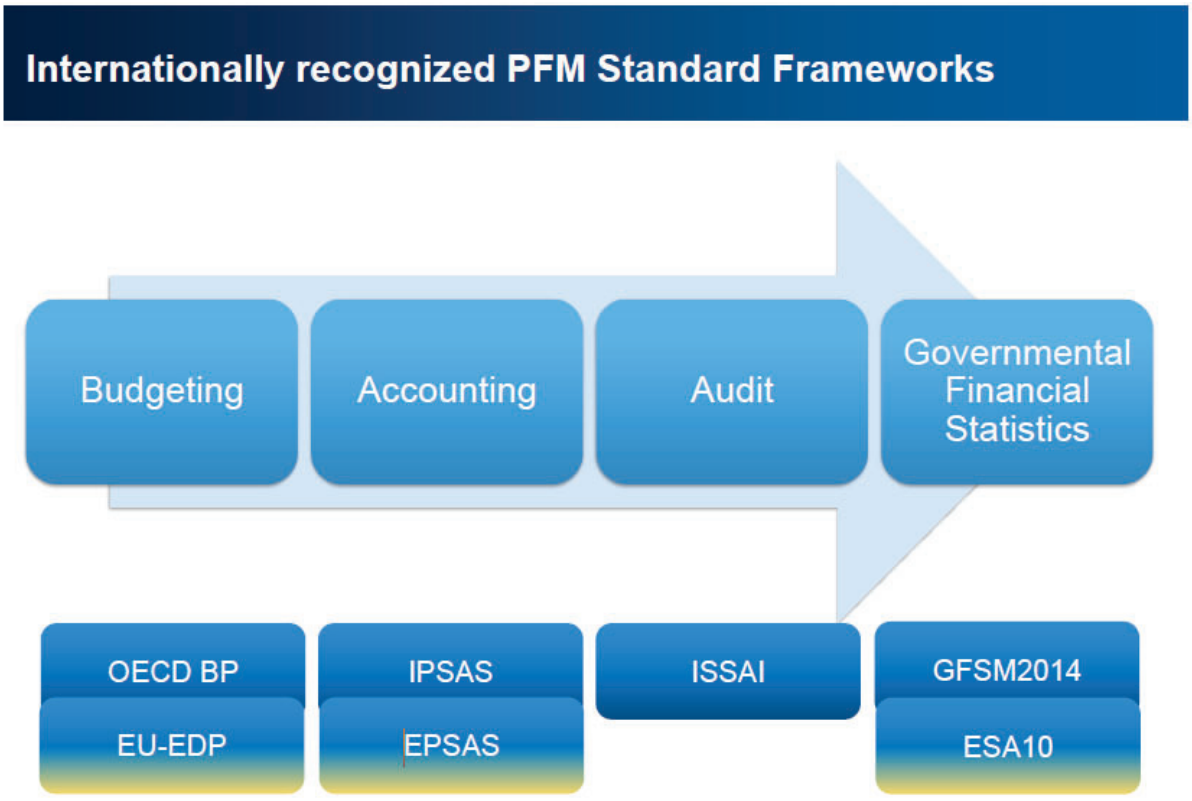


**Figure 4.67 Internationally recognized Public Financial Management Frameworks, IPSAS and EPSAS, Building Competence, Crossing Borders, ZHAW School of Management and Law Winterthur, Switzerland, Andreas Bergmann, (2020)**

Also noting that different financial reporting standards are used,[649] a fact which was noted in this research (IFAC, 2019).

The IFAC., (2021), is the "global voice for the accountancy profession. We serve the public interest through advocacy, development, and support for our member

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649 Bergmann, Andreas., of the ZHAW School of Management and Law (2020), FinCOP, IPSAS and EPSAS, Building Competence, Crossing Borders, Slide 2. Published by Bergmann, A. the Institute of Administrative Management of the ZHAW School of Management and Law, Winterthur, Switzerland available at World bank. Washington DC, USA available at https://cfrr.worldbank.org/sites/default/files/2020-10/04.pdf (Accessed 04 February 2022)

organizations and the more than 3 million accountants who are crucial to our global economy,[650] the (2021) 'Pathways to Accrual' [651]page is "intended for those considering the move to accrual-basis accounting". Their IESBA Board considers ethics and technologies issues they have a Disruptive Technologies Project. Including AI, DAOs and they stated "Disruptive Technologies have significantly impacted the work of accountants, including auditors and those in the finance and advisory fields, especially in terms of the technology and approaches they use. The IESBA has multiple technology-related workstreams[652] I contacted the IFAC 04 February 2022 in relation to their Disruptive Technologies Project advising of my work in this area. It got me thinking about International Financial Reporting Standards (IFRS), Generally Accepted Accounting Principles (GAAP), GAAP USA, GAAP UK and Ireland International Public Sector Accounting Standards (IPSAS) based on IFRS with specific focus for public sector and accounting also for other public sector specific matters, the European Public Sector Accounting Standards (EPSAS), and in Ireland the different accounting standards and practices in private sector (IRFS and GAAP) and the public sector, cash and accruals, and even some own standards e.g. Local Government accruals bases, is based on a Code of

650 International Federation of Accountants, (IFAC)., (2021), Main Webpage paragraph 1. Published by the IFAC, New York USA. Available at https://www.ifac.org/ (Accessed 04 February 2022)

651 IFAC., (2021), 'Pathways to Accrual' webpage. Published by the IFAC, New York USA. Available at https://pathways.ifac.org/standards/pathways/2021 (Accessed 01 March 2022)

652 IFAC, IESBA., (2021) Technology Webpage. Published by the IFAC, IESBA, New York, USA. Available at https://www.ethicsboard.org/consultations-projects/technology https://www.ethicsboard.org/consultations-projects/technology (Accessed 01 March 2022)

Practice and Accounting Regulations which states it is a: “Statement of Recommended Practice (SORP) And that “The policies outlined must be applied in the preparation of the AFS until such time as Ministerial direction is provided and/or the Code of Practice is updated.” (Department of Housing Local Government and Heritage July 2019)

Trinity College Dublin, the University of Dublin is required to comply with the Universities Act 1997, and to keep, in such form as may be approved by “An t-Údarás um Ard-Oideachas”, “and are prepared in accordance with accounting standards generally accepted in Ireland.” “The Consolidated Financial Statements are prepared in accordance with Financial Reporting Standard 102 (FRS 102) and the Statement of Recommended Practice (SORP) - Accounting for Further and Higher Education (2019), issued by the Further and Higher Education (FE/HE) SORP Board in the UK.[653]

The Financial Reporting Council., (FRC), (2022), reference the two financial reporting frameworks, IFRS and UK and Ireland GAAP which they stated is “a framework based on specific company law requirements and accounting standards set by a prescribed body (the FRC), and set out the overall framework in **Figure 4.67** below.

[653] Trinity College Dublin (2021) Consolidated Financial Statements for the year ended 30 September 2020. Pages 2, 9 Published by Trinity College Dublin, Dublin, Ireland. Available at https://www.tcd.ie/financial-services/external-assets/pdfs/Consol_Financial_Statements_1920.pdf (accessed 04 February 2022)

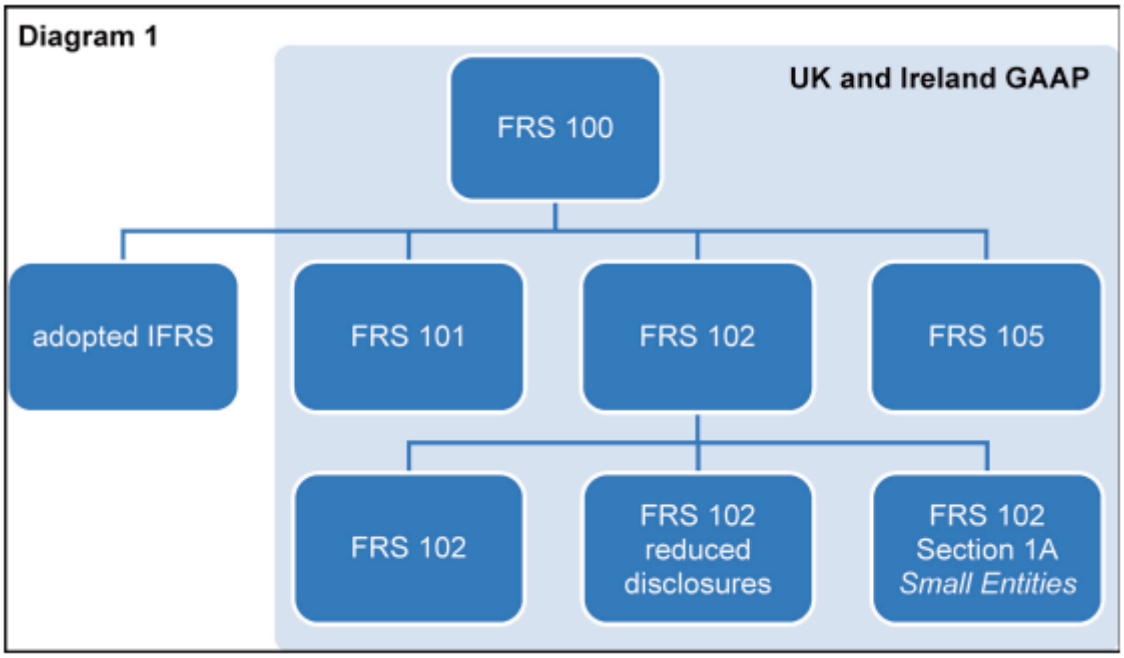


**Figure 4.68 Financial Reporting Council, Application of Financial Reporting Requirements IFRS, and UK and Ireland GAAP, (2022)**

Also noting that the UK and Ireland GAAP reporting framework is made up of five regimes" and that "selection of which regime to apply will depend upon a number of factors". "Publicly listed companies are required to apply adopted IFRS" [654]

In respect of Ireland's financial reporting the OCED, (2019), recommended "a move to accrual accounting information compliant with international standards; harmonising accounting standards used by entities within the general government sector; and implementing a "faster closing" initiative for Government departments and offices, funds and State bodies" also that:

> It will also be important that any legal mandate for standard setting-activity refers to relevant international standards. In doing so, Ireland will have to choose between the two main sources of reference - that is International Financial Reporting

654 Financial Reporting Council (FRC)., (2022) Overview of the financial reporting framework. Pages 4 and 5. Published by the FRC, London. UK. Available at https://www.frc.org.uk/getattachment/8ee72436-f78a-4960-a8d1-1a1d70f49531/Overview-(January-2022)-(1).pdf (accessed 04 February 2022)

> Standards (IFRS), produced by the International Accounting Standards Board (IASB) and developed specifically for use by private sector organisations; or International Public Sector Accounting Standards (IPSAS), produced by the International Public Sector Accounting Standards Board (IPSASB) for use in the public sector." Page 49)
>
> "Preparing accrual accounting information compliant with international standards; harmonising"
>
> "Ireland should also consider the European Union's project to develop its own set of accounting standards for the public sector, the EPSAS, which will use IPSAS as a "reference source".57 It will be important for the Government Accounting Directorate to closely monitor the development of the EPSAS project and any potential modifications that may be proposed to IPSAS standards. (Page 49) [655]

They noted that "only two OECD countries (Australia and the UK) use IFRS as a basis for the development of their public sector accounting standards 56, while an increasing number of countries are using IPSAS (Page 50) (OECD, 2019).

The EU EPSAS project has been in progress since 2013, initial consideration commenced in 2013. Delivering this vision is not an easy project, as noted by Bergmann A., of the ZHAW School of Management and Law (2020) who highlights the different approaches by EU member states as reported by EUROSTAT, in 2017, and he references the EU, Budgetary Frameworks Directive (2011/85/EU) in the context of EPSAS.[656]

> "EPSAS aims to **increase the transparency and comparability of public sector financial accounting** and reporting between and within EU Member States by developing and implementing a **harmonised European accounting framework**.

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656 Bergmann, Andreas., of the ZHAW School of Management and Law (2020), FinCOP, IPSAS and EPSAS, Building Competence, Crossing Borders, Slides 16 and 22. Published by Bergmann, A. the Institute of Administrative Management of the ZHAW School of Management and Law, Winterthur, Switzerland available at World bank. Washington DC, USA available at https://cfrr.worldbank.org/sites/default/files/2020-10/04.pdf (Accessed 04 February 2022)

> This will inform governance, policy and decision-making and the management of public finances.
>
> Information on income and expenses, and assets and liabilities is important for accountability and informed decision-making. In contrast to the private sector, no common accounting standards for financial reporting are in place for the public sector in the EU.[657]

An AI augmented continuous accounting and reporting framework, harmonized across the EU could deliver this vision. Why not using IPSAS though, making it global? But achieving harmonization across the EU and harmonized accounting and reporting in the public sector would deliver a major project, used in conjunction with the EU blockchain and other AI augmented technologies could transform EU public financial management "a harmonized accounting framework.

AI continuous accounting and reporting exists today "'continuous renewal multi-GAAP', contains all the functions required for the creation of financial reports, including financial accounting of transactions covering the entire life-cycle of financial and non-financial instruments, that the embedded Accounting Rules Engine generates journal entries for all accounting transactions, that financial statements and notes are supported that IFRS accounting logic and that the standard chart of accounts are preconfigured and that the IFRS valuation of financial instruments" (Jabatax, Ltd, 2021).

**Recommendations:**

There is need for an advocacy role for Algorithmic Government, raising awareness, collaborative dialogue informing opinion and policy, developing game theory as an educational tool for AI and financials and updating existing corporate governance

657 Eurostat., (2022), EPSAS Published by Eurostat, Lttre Belgium, Overview - EPSAS - Eurostat (europa.eu) (Accessed 04 February 2022)

frameworks to include AI governance ‘of’ and ‘by’ globally. AI in AML/CFT, fraud and corruption prevention and detection and AI Cyber risk management, AI financials budgeting and reporting supports us all in public policy development, implementation, and review.

All Public Bodies should have an Accounting Technician Apprenticeship Programme. Investing in administrative staff providing a useful qualification in financials which will always stand to the apprentices and to Public Sector as their careers progress.

There is need to harmonize the global financial accounting and reporting frameworks for public financial management both internationally recognized and those which are local/country specific.

AI Continuous Accounting, continuous budgeting and AI corporate reporting should be introduced throughout the EU Public Sector. The technology exists today and the support systems including for example, the EBSI blockchain for grants and other.

Why not think global too? An area for further research and advocacy.

# CHAPTER 5

# AI AT THE HELM

# DISCUSSION, CONCLUSIONS, AND IMPLICATIONS

"The future is in the air
I can feel it everywhere
I'm blowing with the wind of change"[658]

## 5.1 What keeps you awake at night? A story. Testing the ethics temperature of Accountants in the UK and Ireland working globally 2021.

It's 3am, you manage budgets, why are you awake worrying? Is your proposed expenditure allocated in your budget 'optimistic'? Is the planned expenditure not informed by the patterns of previous year's expenditure incurred, and you are concerned items are being missed? Is that Business Case you are submitting unrealistic? Are the figures over optimistic, do you know it but have no real choice? Are you being put under pressure? Would AI continuous accounting and budgeting help?

McCall, B., (2021), interview with Níall Fitzgerald, Head of Ethics and Governance at Chartered Accountants Ireland, observations on and the findings of a recent report from the Consultative Committee of Accountancy Bodies[659] a survey of accounting

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658 Meine, Klaus., the Scorpions (1990) Winds of Change. Verse 2 lines 3-6. From the album Crazy World. Published by Meine, Klaus., of the Scorpions, Lyricsfreak.com, Lyrics available at https://www.lyricsfreak.com/s/scorpions/wind+of+change_10212768.html (accessed 18 December 2021)

659 Chartered Accountants Ireland on Consultative Committee of Accountancy Bodies https://www.charteredaccountants.ie/about-us/who-we-work-with/CCABCCAB-I there are two bodies one in the UK and one in Ireland.

The Consultative Committee of Accountancy Bodies – Ireland is the umbrella group of the accountancy professions in Ireland. Website (unsecure) is at http://www.ccab-i.ie/index.html (accessed 05 January 2022)

professionals in Ireland and the UK" and found that "27% had been put under pressure, or, felt under pressure to act in an unethical way in the last three years". The main instances were "over-optimism concerning budgets and business cases, unreasonably downplaying risks in budgets, and categorizing personal expenses as business expenses." The survey found that, "10% of those under pressure carried out the unethical task, while 25% did so, but only partially" and that "in 70% of cases, the accountants concerned spoke up to prevent pressure to break the ethical code" The advice provided is "Generally speaking the advice is to look after the small things before they grow. For Example, don't overlook things like overstating mileage. A disciplined approach to such things will help create a culture where the pressure to act unethically doesn't arise. [660]

Easier said than done. And a real example of how AI can help anyone managing budgets and financials. Bringing even more transparency to this space. I remember, I refused to bow to pressure to claim mileage expenses in line with colleagues, because they were overstated. I was correct, I sought clarification and advice about my claim which confirmed I was correct. I acted ethically. It cost me personally in worry and professionally as my working relationship with my colleagues was gone. A culture where ethics was disconnecting from financials. It can happen to anyone.

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[660] McCall, Barry., (2021), *Becoming trusted problem solver*s. Page 44. McCall, Barry., Accountancy Ireland, December 2021-January 2022 available at (accessed 05 January 2022) [Interview with Níall Fitzgerald, Head of Ethics and Governance Chartered Accountants Ireland about the findings of the recent trust and ethics surveys commissioned by Chartered Accountants Worldwide and the Consultative Committee of Accountancy Bodies.],

Consultative Committee of Accountancy Bodies Ireland and UK undertook an "informal survey to take the ethical temperature of the accountancy profession in the UK and Ireland over the last 3 years and as we emerge from the COVID-19 pandemic." The Chartered Accountants Ireland website also states: "there was a spread of responses across four sectors including members who work in audit or accountancy firms, public sector, commercial sector and charity/non-profit sector". "Some respondents indicated the pressure to act in a professionally unethical way was applied by directors, managers, clients or members of a board or council." "28 per cent of respondents identified the "CFO/FD/CEO/or any other director", "27 per cent identified "My line manager or their line manager" as the person who applied the pressure." "10 per cent cited "the Board/Cabinet/Council".

> **"Incentives** to act unethically were reportedly offered to 6 per cent of respondents with a handful of comments from survey respondents citing bonuses, promotion, favourable treatment and even holidays and cash as examples."
>
> "54 per cent of respondents **felt under threat** in some way. Just over 60 respondents included comments highlighting the toll on mental health and economic well-being this had, which included feeling isolated, being dismissed, being briefed against, facing false allegations, loss of client, "gaslighting[661]", poor performance reviews, being ostracized and future prospects threatened."
>
> The **type of pressure** they were put under from a list of twenty-five options (including an option to include an open-ended response). The top four responses were:
> - Excessive optimism in budgets, business cases, cash flow forecasts and plans
> - Unreasonably downplaying risks in budgets, business cases, cashflow forecast and plans
> - Categorising personal expenses incurred by employees, directors, or shareholders as company expenses

[661] CCAB, (2021), ethics survey results, Briefing, described Gaslighting as "the act of manipulating a person by forcing them to question their thoughts, memories, and the events occurring around them." Page 3

- "Getting around" local policies, standing orders, Standing financial instructions, procurement regulations.

Unethical actions that respondents were asked to do included, misleading financial reporting and 'Verbatim comments in response to this question (the **type of pressure)** included other mattes too, 'not reporting a colleague for unethical behaviour'.

80 per cent spoke up to prevent being put under the pressure.
65 per cent did not carry out the unethical task that they were pressured to do. However, 10 per cent did carry out the task fully and 25 per cent did so partially". g[662]

What if that person was you? What if you were the one in 10? One in 4? What is 'ethical' or 'just ethical enough'. In Financials. When and why did ethics become an optional extra for so many? Consider the personal consequences identified by the respondents "many respondents resigned, were subject to disciplinary processes, being ostracized, being removed from their role or made redundant. A small number experienced an increase in substance misuse (e.g. alcohol and drugs)".[663] How could AI ethics and AI governance frameworks help?

"Relativity applies to physics, not ethics" Einstein, A. [664]

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[662] Chartered Accountants Ireland (2021) website available at https://www.charteredaccountants.ie/Ethics/News/Item/ccab-publish-results-of-2021-ethics-survey (accessed 05 January 2021) Report at link to CCAB website.

[663] Consultative Committee of Accountancy Bodies., (2021), Ethics Survey Briefing Page 4 Published 16 December 2021 by the Consultative Committee of Accountancy Bodies, London, UK, available at https://www.ccab.org.uk/ccab-ethics-survey-2021/ (accessed 05 January 2022)

[664] Einstein, Albert., (1879-1955), "Relativity applies to physics, not ethics." Quote available at Quotes.net https://www.quotes.net/quote/9396 (accessed 21 February 2022) [Physicist and Nobel Laureate]

### 5.1.1 Algorithms Informing the Future, Ethics and Moral Hazard

Mintz, S., (2010) states "Moral hazard occurs when a party protected from risk behaves differently than it would if it were fully exposed to the risk. It arises because an individual or organization does not take full responsibility for its actions so that the consequences of bad behavior do not befall on that party." that the "Responsibility passes to another party that covers the cost of the risky behavior" He states that "if we define right from wrong based on how it affects us in a particular situation then we adhere to the principal of ethical relativism and that is a dangerous path to take."[665]

Consider for example Moral Hazard in the Film 'Sully', Warner Brothers Entertainment (2016) it tells the story about how Captain Sullenberger landed a damaged plane in the Hudson River in 2009, with all lives saved, and the ensuing investigation, references algorithms.[666] I watched it thinking about that aspect. The film highlighted for me, the trust in algorithms I wondered could the algorithm learn from each of the seventeen attempts the pilots who were recreating the scenario, had made to recreate the flight landing before the hearing, which were kept quiet by the investigation team until Captain "Sully"

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665 Mintz, Steve., (2010) Moral Hazard and Ethical Relativism. Paragraphs 1 and 8. Blog Ethics Sage, published by Mintz, Steve, Cal Poly State University San Luis Obispo, California, USA available at https://www.ethicssage.com/2010/10/moral-hazard-and-ethical-relativism.html (accessed 01 March 2022

Note: Known as "The Ethics Sage" to many with a reputation as an expert in ethics, Dr. Steven Mintz is a Professor Emeritus from Cal Poly State University in San Luis Obispo. He received the Accounting Exemplar Award from the Public Interest Section of the American Accounting Association in 2015. His blog, Ethics Sage, was recognized as number 49 out of 100 top philosophy blogs and one of the top 30 blogs on Corporate Social Responsibility. Steve shares insights into business ethics through his Workplace Ethics Advice blog. https://www.ethicssage.com/about.html (Accessed 02 March 2022)

666 Warner Brothers Entertainment (2009) Sully. Available at https://www.warnerbros.com/movies/sully (accessed 26 February 2022)

raised the query at the hearing. Moral hazard and the argument between the investigating committee, who were facing huge insurance costs, and the pilot who landed the plane having made his decision, who if convicted of being at fault, would have lost his job and his pension. And the model's capacity for reinforcement learning too.

Thinking about ethical relativism? "It was always a very grey area." "In acute situations like this often what is right can take on multiple interpretations."[667] Memorable quotes in the Before the Door Opens (2011) film 'Margin Call'. The Netflix film description states: "An analyst uncovers information that could destroy his employer in this drama about an investment bank in the early days of the 2008 financial crisis."

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667 Before the Door Pictures (2011) Margin Call available to rent on google.com https://play.google.com/video/lava/web/player/yt:movie:B2IaSZM53uQ?autoplay=1&authuser=0 and https://play.google.com/store/movies/details/Margin_Call?id=B2IaSZM53uQ&hl=en (accessed rented 25 February 2022)
Note: Set in the high-stakes world of the financial industry, Margin Call is an entangling thriller involving the key players at an investment firm during one perilous 24-hour period in the early stages of the 2008 financial crisis. When an entry-level analyst unlocks information that could prove to be the downfall of the firm, a roller-coaster ride ensues as decisions both financial and moral catapult the lives of all involved to the brink of disaster. Writer/director J.C. Chandor's enthralling first feature is a stark and bravely authentic portrayal of the financial industry and its denizens as they confront the decisions that shape our global future.
Quotes: It was always a very grey area. [One hour three minutes 21 seconds in]. In acute situations like this often what is right can take on multiple interpretations. [One hour four minutes 55 seconds in.

**Figure 5.1 An analyst uncovers information that could destroy his employer Margin Call (2011) by Before the Door Pictures, available on Netflix at** https://www.netflix.com/ca/title/70167125

Yet in the film, both sides in the ethical battle checked, verified, and therefore trusted 'the model' this is important, trust in algorithms, algorithms that are explainable, algorithms that can be explained. The human ethics in underemphasizing the risk when first raised much earlier in the process, and in the subsequent actions knowing the level of damage to others, moral hazard in action. But to emphasise, technology, checking and trust, of the model. And the impact of overriding the model's data, humans with multiple interpretations in acute situations, of their own interpretation. With AI reinforcement learning, it is ever more important not to build 'relative ethics' into learning processes.

The Central Bank of Ireland, (2013) on moral hazard in forecasting and limiting arrears and loan losses on mortgages, noted "behavioural issues such as moral hazard and adverse selection also come into play. The fact that the mortgage has long been seen as a

very simple, very safe, product for the lender, because of secular rises in (nominal) house prices, sizable tax preference for the borrower and a strong credit discipline, has masked these complexities."[668]

Dupont, S., and Lynch, K., (2020) discuss moral hazard, referencing the global financial crisis of 2008-09 which "confronted policy makers with the age-old policy dilemma of moral hazard" noting that "post crisis, policy frameworks were structured in part to respond to moral hazard risks. One noteworthy example was the creation of a new category of "systemically important financial institutions", explicitly judged "too big to fail", but then as a consequence made subject to much tighter regulation and higher minimum capital buffers" they also note that, "moral hazard in public policy interventions is always a risk and containing it can entail touch choices." And they reference the Canada Emergency Relief Benefit (CERB) a Covid-19 relief, positing that "some see the CERB as morphing seamlessly into a guaranteed minimum income without the wider structural economic and social policy reforms that will have to accompany a necessary review of the social protection system." And they reference other future challenges including "digitize business" tackling "climate change while realizing the best value for our resources and meet energy needs responsibly" and delivery of "lifelong learning" and facilitating "adjustment" and ensure "wide participation in our prosperity" noting that "the greatest

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668 The Central Bank of Ireland, (2013) Adverse selection and moral hazard in forecasting and limiting arrears and loan losses on mortgages. Paragraph 2. Published by the Central bank of Ireland, Dublin, Ireland, available at https://www.centralbank.ie/news/article/adverse-selection-and-moral-hazard-in-forecasting-and-limiting-arrears-and-loan-losses-on-mortgages (Accessed 02 March 2022)

The Central Bank of Ireland article based on an address by Patrick Honohan to the Society of Actuaries in Ireland., (2013) on adverse selection and moral hazard in forecasting and limiting arrears and loan losses on mortgages.

moral hazard for Canadians lies in evading these hard questions." [669] They don't mention the role of AI and aligned technologies but there is a significant role AI can play in each of the matters raised e.g., Universal Basis Income, Sustainable Finance, Climate Change, Lifelong learning, Inclusiveness, in their discourse.

Rowe, M., (2018) Professor of Criminology, references AI profiling and the social and moral hazards of predictive policing, and the "impact of data on risk profiling" referencing a "UK police force using an algorithm designed to help it make custody decisions, and forced to alter it amid concerns that it discriminate against poor people" also noting the benefits of the approach of using "sensors, data sets and intelligence" all as part of information, "transforming the power and reach of intelligence within policing" and concluding when considering the social, political and criminal justice potential for inequalities "so, society needs to maintain a critical perspective on the use of AI on moral and ethical grounds.[670]

Algorithmwatch, Fair Trials, European Digital Rights, and 38 civil society organisations., (2022), called for the EU to ban predictive policing systems on 01 March

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669 Dupont, Serge, and Kevin Lynch., Johnson Shoyama Graduate School of Policy, Canada., (2020), Beware of Moral Hazard in Covid-19 Policy Responses Paragraphs 1, 6, 15 and 33 Published by Dupont, Serge, , and Kevin Lynch, of the Johnson Shoyama Graduate School of Public Policy, Canada, Available at https://www.schoolofpublicpolicy.sk.ca/documents/research/policy-briefs/jsgs-policybriefs-covid-series-moral-hazard-of-policy-response.pdf (accessed 02 March 2022) Note Dupont, Serge, Former Deputy Clerk of the Privy Council, and Kevin Lynch, Former Clark of the Privy Council.

670 Rowe, Mike., Professor., (2018), AI Profiling the Social and Moral hazards of 'predictive' policing. 3-page article. Published by Rowe, Mike Professor of Criminology, Northumbria University, Newcastle, UK on The Conversation.com London, UK, available at https://theconversation.com/ai-profiling-the-social-and-moral-hazards-of-predictive-policing-92960 (accessed 02 march 2022)

2022. They statement noted for example, "AI systems used by law enforcement often have technological or commercial barriers that prevent effective and meaningful scrutiny, transparency, and accountability." that "it is crucial that individuals affected by these systems' decisions are aware of their use and have clear and effective routes to challenge it." [671]

To adapt the Dupont, Serge, and Kevin Lynch., of Johnson Shoyama Graduate School of Policy, Canada., (2020), observation, "the greatest moral hazard for us all lies in evading these hard questions" and as stated by Rowe, M., (2018), "society needs to maintain a critical perspective on the use of AI on moral and ethical grounds." We need to promote transparency, build on existing global agreements on AI and the moral and ethical grounds, including the ability for us to challenge policy. Don't evade hard issues.

**5.2 How does AI Ethics fit into the global game?**

"UNESCO member states have adopted the 1st ever global agreement on the Ethics of Artificial Intelligence" (2021).[672] "We are at the beginning of the development of AI across our economic, political and social systems" "we are confronting an important ethical

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671 Algorithmwatch., Fair Trials., European Digital Rights (EDRi) and 38 civil society organisations, (2022), AlgorithmWatch signs statement on ban of predictive policing in the Artificial Intelligence Act. Paragraph 1. Published by Algorithmwatch,

672 UNESCO., (2021), Tweet 25 November 2021on Press Release UNESCO member states adopt the first ever global agreement on the Ethics of Artificial Intelligence. https://twitter.com/UNESCO/status/1463929556667187200?ref_src=twsrc%5Etfw (accessed 10 January 2022) and Report downloaded from https://unesdoc.unesco.org/ark:/48223/pf0000379920.page=14 (accessed 10 January 2022)

crossroad", "it is a challenge to determine where AI fits in the global game' (Pawels, E., Cockayne, J., 2018).

At the EMI Moving Europe Together Online Roundtable Discussion of 09 December 3pm where I posed the following questions:

1. One of the objectives of the EU digital policy is to promote AI in the public and private sector, how can we better promote use of AI in financials augmented with machine learning or PA for example AI budgets AI actual expenditure and continuous accounting and in the AML CFT initiatives?
2. How can we make use of the EBSI blockchain in public sector in Ireland could we use it to manage grant funding within the EU and through tiers of recipients? I noted the use of similar in the USA today.
3. How can we better support use of drones in agricultural challenges?
4. The EU is involved in space exploration and policy development. Given the increasing space junk problems and introduction of space tourism, do we need to do more in an advocacy role? The response was that the Polluter Pay principle applies.

These questions will also feed into consideration of EU policy but are global considerations.

The World Economic Forum Strategic Intelligence Platform (2022) is used to help "make sense of complex forces driving transformational change across economies, industries and global issues It uses AI and ML providing a strategic picture, continually updated for briefings from Academia, Government, Business and Civil Society allowing users to develop their own strategic map for issues most relevant to them, helping to drive strategic conversations as noted in their explanatory video. [673]

Interestingly, I could find nothing when I searched for Autonomous AI, but I started one called AI at the Helm and will monitor, also using it to advocate discussion. A perfect

[673] World Economic Forum (2022) Strategic Intelligence Platform available at https://intelligence.weforum.org/ (accessed 29 January 2022)

opportunity to advocate, discussion and debate on this topic, on a global site as the maps are public.

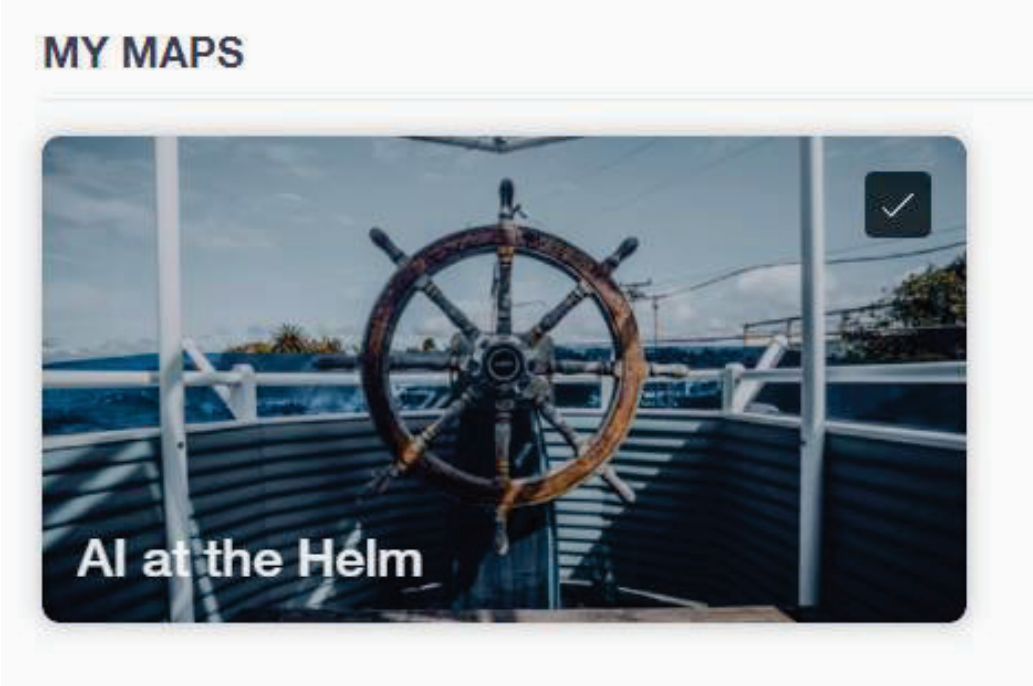


**Figure 5.2 AI at the Helm by Marita Gonsalves available at WEF https://intelligence.weforum.org/topics/9f7e60b1ec87405e9b2992aeb9dd6c1f (Created 29 January 2022) (Picture copyright Joseph Barnentos on WEF site).**

For copyright reasons I uploaded my own picture. The AI and ML of the Strategic Intelligence Platform, ensures the content is continuously updated with the latest thinking and insights.

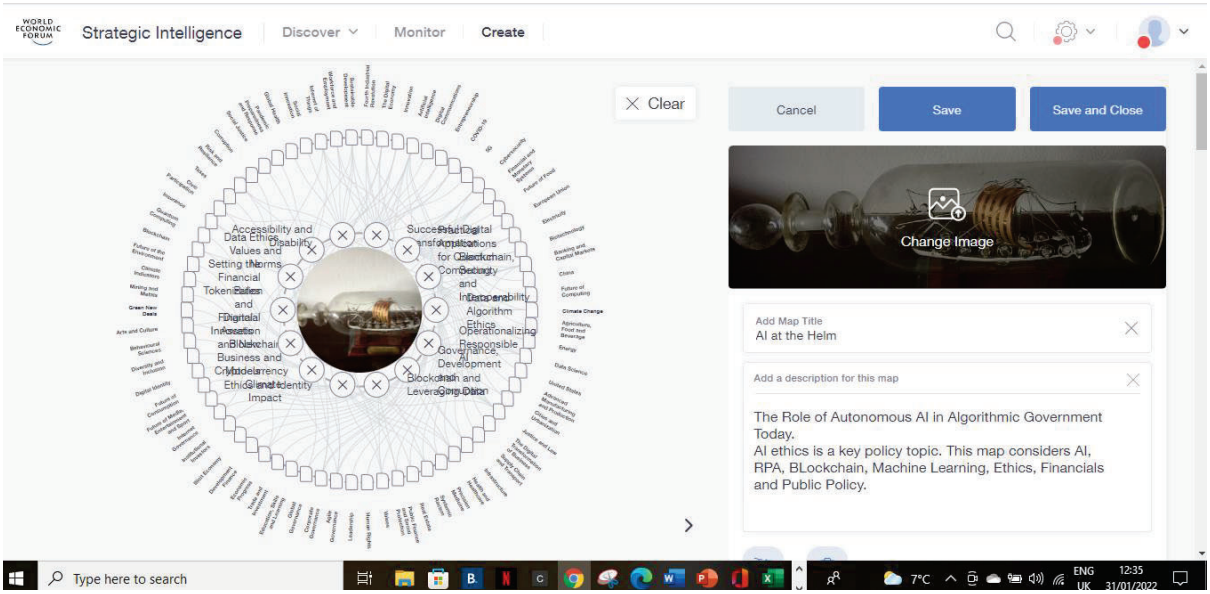


**Figure 5.3 AI at the Helm by Marita Gonsalves available at WEF** https://intelligence.weforum.org/topics/9f7e60b1ec87405e9b2992aeb9dd6c1f **(Created 29 January 2022 updates 31 January 2022) (Picture author's own)**

For example, on 31 January 2022, a new blog, published by the London School of Economics, noted that a human rights perspective could compliment the EU's AI Act. [674] This supports my research, and it is interesting to note that blogs are part of the AI and ML continuous updates on global research sites. I could use 10 languages on this Platform, fewer than on the EU Citizens Platform. AI use in language translations is an area for

674 Onitiu, Daria., (2022), Blog, Published by Onitiu, Daria., London School of Economics, London, UK. World Economic Forum, Colgony, Geneva, Switzerland, available at https://intelligence.weforum.org/topics/9f7e60b1ec87405e9b2992aeb9dd6c1f/publications/4ffe4f12b3be4e26b059d2985f3a27d5 (Accessed 31 January 2022) also at https://blogs.lse.ac.uk/europpblog/2022/01/31/how-a-human-rights-perspective-could-complement-the-eus-ai-act/

further research. Also, AI use in assistive technology benefiting Diversity and Inclusiveness. Speak to Text isn't automatically provided in the Irish Public Sector, other assistive technologies are. All, global issues and important to research further, maps to enhanced inclusiveness for all, supported by AI.

## 5.3Discussion: Artificially Intelligent Governance and Public Policy Findings

This research asked the question, how does an AI governance framework benefit public policy? The research data collection and literature review sought to explore this in the context of six key sub-questions, below initially explored in the literature review.

### 5.3.1 Q1. What is AI ethics and why does it matter?

Q1. What is AI ethics and why does it matter? AI ethics were defined, (Schiff et al., 2020) (Müller, 2020) (Moss et al., 2020) (Siau & Weiyu, 2020), (Leslie, 2019), (Rossi et al., 2019) autonomous and non-autonomous (Larsson & Heintz, 2020), (Blackman, 2020), (Schranz, 2020) (European Commission, 2019) (van Wynsberghe & Donhauser, 2018), (Dignum, 2018). For autonomous AI it was felt that a robot/piece of software needed a worldview if it is expected to make autonomous decisions. (Sawal, 2021), (Heaven, 2018), (Kucara, 2017), (Bradley, 2017) (McCarthy, 2006). Sensemaking was noted as of importance. (Siau & Wang, 2020), (Moss et al., 2020) (Müller 2020) (Leslie 2019) (Weick, 1993) (Ginsberg 1986) (Berger & Luckman 1966). Shaping AI ethics, through citizen engagement and crowdsourcing AI ethics was explored. (EU SHERPA, SIENNA, PANELFIT, 2021) (Awad & Levine, 2020) (Scalable Corporate MIT Media Lab and Massachusetts Institute of Technology, 2020). Robot rights and citizenship was explored

and the need for ‘kill switches’ was explored in the EU and the EU convergence in corporate governance in member states was noted. (European Commission, 2021, 2020, 2017) (Risse, 2020) (Siau & Weiyu, 2020) (Weiyu & Keng, 2020) (European Parliament, 2017) (EcdDa, 2015). The importance of risk assessment of governance of big data and digital audit was highlighted. (UN, 2021) (Holm, 2020) (Haynes, 2020) (Estonian Government, 2021, 2020) (Misuarca & van Noordt, 2020) (Ireland Government DPER, 2019) (Pencheva et al. 2018), (Reddin, 2018) AI in Smart Cities was noted as supporting UN sustainable development goals. (Eden Strategy Institute, 2021, 2020), (Wesam & Lamaa, 2021) (Karvonen et al., 2019) (Ouarda et al., 2019) (Ryan & Gregory, 2019) (Cudden, 2016) Global public sector ethics and algorithmic government today were highlighted. (Transparency International, 2021, 2015) (European Union, 2021) (OECD 2021, 2019, 2015) (Gellers, 2021) (Ariga et al., 2020) (Engin & Treleaven, 2018), (Vergez, 2007) (McCarthy 2006).

An AI Ethics adapted model was developed from the research, Algorithmic Government Today, which included a new tier of governance ‘AI at the Helm’ governance by AI, in addition to governance of AI RPA, ML and Blockchain technologies including AI financials.

Focusing on whether AI financials would enhance the Irish Public Policy Cycle responding to a request from my government department an action research cycle governance mapping PSC policy internal processes reported findings, made recommendations to effect change and improvement, cycle one. I first observed the thinking about a disconnect between financials and policy evidenced in the advice on difficulties experienced by professional accountants as they progressed in the grey area,

thinking noted as a concern by accountants in Ireland and the UK. I thought to bring rigor and support through recommending AI augmented continuous accounting, AI, RPA financial appraisal for exchequer funding PSC appraisal and blockchain and RPA use for grant management. In Cycle two this thinking progressed, and the Internal Audit Global 3 Lines of Defence Model was adapted to position PSC governance and appraisal, and I worked with colleagues in DPER OGCIO and on my team, scoping and refining a bespoke build to share tool, called e-PSC, now being piloted by the Department of Housing, Local Government and Heritage, with a view that the DPER National Infrastructure Officer would then roll out across government departments nationally. E-PSC identifies all Exchequer and other Funding sources, improving transparency across tiers of government and can be used to respond to Parliamentary Questions, report on Project Ireland 2040 projects, and report on annual PSC Quality Assurance.

The AI augmented financial appraisal need was acknowledged but didn't happen through DPER although the preliminary discussions and thinking was important. I progressed through private sector seeking a template that could be used for financial forecasting which could be adapted for exchequer funding. That work is still in progress with IBM and will now progress beyond this doctorate as part of a recommended continuing Advocacy Role. Importantly, this means that moving outside of Ireland's PSC Policy Cycle allows this to be used by a wider public sector audience.

The IMF., (2014), noted that Ethics go to the heart of Financial Stability and asked many questions still relevant today: "How big are ethical problems? How do we ensure ethics are part of our financial culture? How big a part do ethics play in our Financial systems? What is the future of banks? What about non-banks, shell banks providing

financial services? What changes are likely to happen in the financial systems as a result of technological innovations over the next 5-10 years? In advanced economies, emerging economies and areas of disadvantage". [675]

The IMF Global Financial Stability Report (April 2021) had highlighted two emerging themes:

> **First** if accompanied by a move toward policy normalization in advanced economies and rapidly rising interest rates—may result in tighter financial conditions and large portfolio outflows in emerging market economies. **Second**, highly accommodative financial conditions may have unintended consequences. If not addressed, financial vulnerabilities exposed by the pandemic may become new structural legacy problems.[676]

I commenced exploration about using AI, RPA, ML and Blockchain in Exchequer funding financial management and commenced research into continuous accounting and AI augmented forecasting. I undertook a risk assessment of AI and PSC processes using the Canadian Algorithmic Impact Assessment tool. The initial 'walkthrough risk assessment' of the manual and excel-based PSC systems of Ireland was undertaken on 06 June 2021 and indicated an impact level of 3, impact score 68 and mitigation score of 40. The PSC reporting tools for Project Ireland 2040 were further examined in Cycle 6 but

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675 IMF., (October 12, 2014), *The Future of Finance, Session 1: Ethics and Finance*. Published by the IMF, Washington, USA, available at https://www.imf.org/en/Videos/view?year=2014&keyword=3835505509001&sort=mostrecent (accessed 10 Jan 2022) also https://www.imf.org/external/POS_Meetings/SeminarDetails_archive.aspx?SeminarId=13 (accessed 10 Jan 2022)

676 IMF., (2021), *Global Financial Stability Report, April 2021: Pre-empting a Legacy of Vulnerabilities*. Chapter 1, Global Financial Stability Overview, Pages 1, 2, 6 and 26, Published by the IMF, Washington, USA, available at https://www.imf.org/en/Publications/GFSR/Issues/2021/04/06/global-financial-stability-report-april-2021 (accessed 10 January 2022)

because of the work completed in relation to e-PSC development, the new Financial Appraisal template circulated November 2021 by DPER, and the issues noted in the Project Ireland reporting database reported in Cycle 6, a decision was made not to undertake further risk assessment until e-PSC is operational and there has been opportunity to implement the two excel-based Financial appraisal templates implementing the new requirements of the Project Ireland database which now, since November 2021, records projects/programmes under €20m supported by both templates, one of which is for projects/programmes proposals less than €1m and one for all other proposals[677] A step in the right direction but not AI-augmented financial forecasting, still a disconnect of AI and financials.

Citizen engagement in crowdsourcing AI ethics was explored through a series of AI governance and policy scenarios developed as part of this research and were first uploaded on the Carnegie Council site as a Global Ethics Day 2021 event. The findings were then uploaded to Leximancer AI for augmented text analysis. AI ethics scenarios clearly linked AI with bots, crowdsourcing autonomous vehicles ethics, involvement in policy, citizens views matter. However, a surprising finding was that AI wasn't associated with accounts or scrutiny of accounts, or AI decentralized autonomous organisations (DAOs) also that the role of the citizen as elector is disassociated from scrutiny of financial

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677 DPER, Ireland, (2021), Public Spending Code, Financial appraisal guidelines, Published by DPER, Dublin, Ireland available at: https://www.gov.ie/en/publication/public-spending-code/ (Accessed 31 January 2022) (Website last updated 25 November 2021)

Note: The financial appraisal guidance is updated in Q4 of 2021 and two financial appraisal templates are now required. The website states This guide sets out the principles for conducting a financial analysis and provides supporting templates designed in the main for the conduct of projects under €1m and over €1m.

statements/accounts a very important role holding elected representatives to account in their stewardship of public funds.

The insight about the citizen right to access local authority books and records, with a record of crime or terrorism, accessing its very financials and other data that might be subject to GDPR, and the insights pre-programming of Robot Citizens and many other ideas raised for consideration.

Acknowledging the Voting right of AI as a Citizen and AI on a Board of Directors was accepted with the caveat of it depends on what they are directing, which made me think as to how this could be achieved.

Tokmakov, M.A. (2019), had noted, "crypto-assets (tokens) holders whose legal position requires determining again raises the question of the possibility of recognition of legal personality of computer programmes, particularly decentralised autonomous organisations (DAOs) and AI." This concept, AI boards for DAOs was accepted and should be part of an adapted Corporate Governance Legal Framework, reflected in the Memo and Articles of Association of AI DAOs.

The benefit of AI DAOs was noted and again the concerns/caveats noted related to human involvement needed, something which could be written into the Company Memo and Articles of Association. Does this need to be considered in an updated risk assessment as an emerging technology and different use.

The observation on pre-programming by a political source was something I had not considered before. I had considered biased data and Robotics, but not political manipulation of Robots. War, neutrality, was noted as important in the literature review. (The UNIDIR 2021) (Verbruggen, M., 2019)) highlighted the increasing risk of

autonomous robotics in war and of Democracy. The FATF (2021) work and global recommendations under AML/CFT, the global issue, the finding at the Carnegie Council citizen comment of the risk of robots use financing terrorism, another war, against criminals, with significant global suffering.

There is awareness of this global issue, organised crime. I received a 2022 briefing from the World Economic Forum co-created with the Global Initiative against Transnational Organized Crime (2019) the dynamic briefing notes it draws "on the collective intelligence of the Forum network to explore the key trends, interconnections and interdependencies between industry, regional and global issues." It stated:

> "Organized crime may prevent the achievement of nearly one quarter of the United Nations' Sustainable Development Goals, according to the Global Initiative against Transnational Organized Crime. Illicit trade in people, goods, drugs, money, intellectual property, and natural resources has made criminal networks into multi-billion-dollar syndicates - undermining legitimate companies, the integrity of governments, and public security."[678]

Evaluation of the benefit and reach and AI use in predictive policing fighting organised crime, would appear to be supported by these assessments, as is use of AI augmented financials, also a key consideration, in this global issue.

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[678] The Global Initiative Against Transnational Organised Crime and the World Economic Forum (2022) *Illicit Economy- Dynamic Curated Briefing.* Pages 2 and 3. Published by the Global Initiative Against Transnational Organised Crime. South Africa and World Economic Forum, Geneva, Switzerland, on their Strategic Intelligence Platform available at https://intelligence.weforum.org/topics/a1Gb0000000LENgEAO (accessed 30 January 2022)
Note: This report was generated 30 January 2022 by the World Economic Forum Strategic Platform. The report states: the 2019 briefing is based on the views of a wide range of experts from the World Economic Forum's Expert Network and is curated in partnership with Mark Shaw and Tuesday Reitano, Director and Deputy Director of the Global Initiative against Transnational and Organized Crime.

The FATF., (2021), report on money laundering from environmental crime case studies identify good practices that governments and the private sector can take to disrupt the profitability of environmental crimes", but noted that "government actions to detect and disrupt financial flows have not been proportionate to the scale of environmental crime" and they mention "the need for AML authorities to build working relationships with non-traditional partners including environmental crime investigators and environmental protection agencies to establish multi-stakeholder dialogues' although 'countries did not submit any case with financial investigations involving new technologies such as virtual assets, or peer-to-peer transactions, the report notes the 'absence of case information on the use of new technologies does not mean those criminals are not using such technologies.'

The IMF (2021), October report commented on Climate Change, Covid19 and Cryptocurrency noting that financial stability risks have been contained for now and stated:

> As the world continues to navigate the exit from the global pandemic, an accelerating
>
> trend of digitalization and the existential threat from climate change pose both opportunities and challenges ahead. These 3Cs— COVID-19, Crypto, and Climate—offer opportunities for sustaining the ongoing recovery; facilitating more efficient, accessible, and inclusive financial service provision; and greening the economy. But they also require a global concerted effort to counter risks and vulnerabilities, which if left unchecked, could put growth at risk in the medium term or test the resilience of the global financial system. Financial stability risks have been contained for now.

Also, that:

> A sound regulatory framework for crypto assets, and decentralized finance markets more generally, must be a priority on the global policy agenda. This is particularly pressing for stablecoins, for which some business models have been subject to the

> risk of sudden and severe liquidity pressures. A regulatory level playing field is a key priority. [679]

AI for social good had also been considered in the Carnegie Council event in the context of use of Cryptocurrency. The findings of this were used to refine thinking about AI, AML and CFT and the related advocacy role and risk assessment recommendations of this research, including the advocacy role in relation to AI ethics, Algorithmic Government, and Governance and financials, on the Carnegie Council, Conference on the Future of Europe Citizen Platforms, the World Economic Forum Strategic Policy Platform, with IFAC, IBM, the Department of Finance Ireland AML/CFT division.

The European Parliament, the Council, and the European Commission (2021) conference on the Future of Europe platform "created an opportunity for European citizens from all 27 Member States to engage in a debate on Europe's challenges and priorities in order to create together a Europe fit for the future." All ideas and events on the platform are "collected, analysed and serve as input into the work of the European Citizens Panels and Conference Plenary". (EU 2021) No citizens responded to the AI scenarios on the Conference of European platform something I'd noted about most of the ideas raised by others also, so I submitted the AI scenarios translated into Irish to an event hosted by the European movement of Ireland and Department of foreign affairs Ireland, at which I outlined the scenarios in writing and in the event speaking in Irish as I wanted to reach a demographic that I might not otherwise have reached. The event report will be provided to the European Parliament for consideration and includes the 8 AI scenarios. This report and

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679 IMF (2021), Covid19, Crypto and Climate, Navigating Challenging Transitions Page ix. Published by the IMF, Washington, USA. Available at https://www.imf.org/en/Publications/GFSR (accessed 10 January 2021)

further engagement at events hosted by the European Movement Ireland on the platform will inform the policy deliberations of the EU citizen forum.

I attended two further events, hosted on the Conference for the Future of Europe platform, one in cyber security in which I asked preapproved questions on AI in the context of cyber security again these questions formed part of the conference summary paper and report again influencing European policy I attended a third conference on sustainability both the environment where, as mentioned earlier I had raised questions about space junk environmental impact including weather forecasting, AI drone use benefiting Agriculture, and AI financials, again advocating continuous accounting and AI forecasting.

Fulton, B., of the Ethics and Compliance Initiative, (2021) stated "AI and predictive analytics has changed the ways in which organizations create products and do business" noting that "developing AI systems to optimize risk management, can have exponentially positive effects" supporting ethics and compliance, if "developed with a core set of guiding principles". He stated that "big data is powerful and if you learn to leverage it correctly, it could help ethics and compliance practitioners develop complex risk management procedures and other tasks important to a high-performing ethics and compliance function".

The research Ethics Canvas AI Financials data ethics in public policy highlighted aspects of '**Behaviour'** which are important to reflect upon in the context of the importance of AI ethics, acceptance of Digital co-workers, AI judgements on public sector values impartiality, legality, integrity, transparency, efficiency, equality responsibility and justice being built into applications and the same for the EU values human dignity, freedom democracy equality for all citizens before the law rule of law, human rights. Consideration

of Robot Citizen rights and Kill switches. Swarm Robots rights. Reflecting further on the need for culture change to understanding the benefits AI, working with AI, being governed by AI – AI at the Helm, the AI Diplomat, AI Government Policymaker, AI software with Voting Rights Autonomous Boards of DAOs and Robot Citizens noting under **Groups Affected** that Algorithmic government and governance will have a bigger impact on society, and then on finance, due to the pervasive nature of the public service.

### 5.3.2 Question 2. Do ethics governance frameworks for financial data incorporate AI ethics?

Financial governance standards and measures are outlined (IFAC (2021), European Commission (2021)), and accounting approaches (Metcalfe, A., and Sanderson, K., (2019). The mission, vision, and values of lead standard setters in the financial world including sustainability, integrity, financial expertise, transparency, sustainable economic growth, and poverty reduction also advocacy are outlines (IFAC (2021), (2020), (2013), (2010), IIA (2021), AICPCA (2021), IMA (2021), CFI (2021), IMF (2021), World Bank (2021), OECD (2021), (2019), UASCM (2018)). In relation to global financial standards the IFAC are acknowledged as setting global financial governance standards and their mission, vision and values permeate all financial entities within their membership.

The blurring of lines between accountants and non-accountants in managing financials was noted. Hunter. A., CPA Australia (2021). The global AI ethics guidelines listed on Algorithmwatch were identified as relatively ineffective, but that they had data principles. (Haas. L. Giessler, S. Thiel, V. (2021) Hagendorf, T. (2019)) although guidelines had a number of principles, including transparency, justice and fairness, non-malefience, responsibility and privacy (Jobin. A. et al (2019) and fundamental human

rights (EU Agency for Fundamental Human Rights (2020). Use of AI maturity models and Algorithmic impact assessments were highlighted as beneficial to entities to assess AI use (Institute for Ethical AI and Machine Leaning UK (2020), ElementAI (2020) Król. K, Zdanek D. (2020) Caplan et al (2028), although it was noted that while AI is beginning to replace or augment decision making, bias and discrimination were matters of concern also ethics risks (Centre for Data Ethics and Innovation, 2020) (LaPlante 2019).

Interoperable public services principles are outlined (European Commission (2021), (2017)). There was a clear link between financial ethics governance framework and AI ethics in only one entity USACM (2018). In all others financial ethics governance frameworks lacked specific reference to AI ethics Accountants ethical frameworks and how they relate to AI and financial data production, integration, audit and assurance highlighted a lack of specific references to AI (IFAC (2021), (2020), (2019), IAASA (2021), CAI (2020), OECD (2017), Committee on the financial aspects of corporate governance and Gee and Co Ltd (The Cadbury Committee) (1992)). There was heightened awareness that auditors must be able to audit AI (Munoko. I. Brown-Libund H. Vaserhelzi. M., (2020), Ding. K. et al. (2020), Kaya. C. T. Turlylinex. M. Biral, B. (2018)) and human/AI team collaboration is mentioned (Weld. D. S. Bansal. G. (2018) and acknowledgement of the increasing use of swarm robotics in blockchain and autonomous AI, Burrows. L. (2021), (UN (2018), Juiz. C. Colomo-Palacias, R. Gómez B. (2018), Ferrer E. C. (2017) Dias et al., (2006)) but in the literature reviewed, AI was in use but that there isn't always a clearly specified link to an ethics framework and the guidelines in place were not considered adequate.

Although the benefits of AI use in accounting today and in corporate reporting were noted (Yoon. S., (2020), Chao. F. (2020), Financial Services Agency Japan (2019), Financial Reporting Council UK (2019), and continuous accounting and budgets used (Jabatax Ltd (2021), Blackline Ltd (2020), Stein Smith S. (2018), no specific links were made with ethics governance frameworks, they were made with standard setting frameworks. This is particularly relevant for emerging technologies, cryptocurrencies, DAOs, and modes of governance of and by AI.

Moy, Christine., and Carson, Jill., (2021), highlight that "the crypto economy is leading to the development of an alternative financial and technological infrastructure that is global, open source, and accessible to all who have access to the internet" that "the crypto economy is resulting in tangible, programmable, and modular technologies focused on value store, peer-to-peer micropayments, lending, margin/collateralization, market making, and price discovery" and, the potential for "broader global financial inclusiveness of billions of under- and unbanked people tomorrow through simple to set-up and low cost automated financial services at scale.

UNICEF (2021) report on a number of projects funded through cryptocurrency including a project "building an open, permissionless protocol for decentralized governance, creating decision-making structures for DAOs

Cheyenne, Wyo (2021), states that the American CryptoFed DAO is legally recognized by the State of Wyoming as the First Decentralized Autonomous Organization in the United States that monetary independence celebrated with the first DAO filing in Wyoming, noting that the mission of the American CryptoFed DAO is to create and sustain

a monetary system with zero inflation, zero deflation and zero transaction costs' also referencing the vision of the DAO CEO, that, in his time, his 'role as CEO will vanish, as all governance token holders will be voting on governance matters without the influence of an executive team."

The World Economic Forum (2021) noted in respect of DAOs that Blockchain enables other technologies to take consequential actions without human input, that DAOs are digital entities that function through pre-coded rules – in effect, organizations run by code. These entities are largely self-sustaining, requiring little to no human input and DAOs present some of the most pressing governance gap issues for blockchain.

Gerbert, P., et al., of Odgers Berndston., (2020), describe how AI "affects company board roles, individually and collectively" advising "to be prepared for novel challenges when scaling an AI solution." Mehrotha, V, Somesh Blockchain Labs., (2021), highlighted how GovBlocks is a solution to replace boardroom-led decision making into community-led decision making" that:

> "Decentralizing governance, is restructuring or reorganization of authority so that there is a system of co-responsibility between institutions of governance at different levels. Decentralization allows users to participate in a trustless system while also increasing people's opportunities for participation in economic, social and political decisions. Moreover, decentralization enhances responsiveness, transparency and accountability by almost eliminating the risk of systemic failure. GovBlocks allows businesses to pragmatically decentralize themselves."

Research findings for the AI scenarios found, that the respondents were opposed to their governments adopting cryptocurrency, one noting the risk of fraud by rogue elements of society.

The benefit of AI DAOs was noted with the concerns/caveats noted related to human involvement needed, also, the importance of the ability of those monitoring to know

about the basic subject, which in the scenario AI DAO with an AI board member related to understanding public financial management, the human needing to be appropriately qualified in the subject so that they could critically monitor and review AI output.

AI Ethics Traits, literature review of 306 documents and other media, to 07 June 2021, which included research documents and articles, had one common cross-trait, Transparency.

The Ethics Canvas **'Worldviews**' highlighted how AI can contribute to the Betterment of Society, 'AI for good' for example through 'Continuous accounting, budgeting and reporting AI complete and accurate view of performance; and transparency over the use of resources; credibility; improved programme management; and harmonisation of financial reporting. Blockchain use for grants management' using 'Cryptocurrency for social good'. 'Financial anomalies spotted by AI supporting AML/CFT'. Robotic swarms and, smart cities, environmental management improvement. Public sector staff, digital training, upskilling, more value-added work. The development of AI-EI, potential signaling if a person is under pressure (through keyboard strokes) - AI-EI helping to identify radicalisation.

Improved transparency of global financials and societal good. But the Ethics Governance Frameworks for Financial Data today, need to do some catching up. What about the public sector ethics governance frameworks?

### 5.3.3 Question 3. Do public sector ethics governance frameworks for financial data incorporate AI ethics?

There was awareness of AI use in public sector and that its potential is increasing also of the importance of AI ethics. But the IFAC and IMF financial frameworks were not

included in the Algorithmwatch list at the time of updated review July 2021. Haas, Gießler, (2021) (2020). It was also noted that current policy discourse focusses on the governance of AI far more than the governance with (by) AI (AI at the Helm). (UNIDIR, Ekelhof & Persi (2021), Baker-Brunnbauer (2020), OECD, Berryhill et.al. (2019), Verbruggen (2019) UK Civil Service (2017).

Risk/Threat assessment is considered (Financial Action Task Force (2021), Europol (2021) (2020), Stupp, (2019). Use of algorithmic assessments and case study assessments is increasing Canadian Government (2021) (2018), Misuarce & vanNoordt (2020), Ada Lovelace Institute UK DataKind UK(2019) (Singapore Government, Department for Communications and Information (2019), Ireland OC&AG (2018). Blockchain RPA and AI use is noted EU, European Commission Blockchain Services Infrastructure (2021) (2018), European Court of Auditors (2020) (2018), Federal RPA Community of Practice USA (2020) Somaya et al., (2019) Mitre Corporation USA (2019), European Commission, Allessie, Sobolewski, Vaccari (2019). AI in ICT accessibility potential for inclusiveness is noted. Centre for legal leadership (2021), UNITU (2019).

Global ethics principles for public sector are promoted by the OECD (2019) (2018), UN (2021), World Bank, IMF (2021) and the IFAC (2021) public sector boards. Ireland is governed by the EU and Ireland's public sector ethics guidelines. Ireland's ethics guidelines are set and monitored by the Standards in Public Office (SIPO) and its public financial procedures by the Department of Finance (2019). AI ethics aren't referenced.

The UNESCO (2021) AI recommendation noted the tension between values and principles (p6). The EU (2017) define EU principles and values noting that principles

should be fundamental and enduring, citing an example as *honesty* which should apply to all public officials irrespective of time or place.

SIPO's annual report (2021) highlighted that the Commission has called for a comprehensive review of the existing ethics framework' referencing the anti-fraud and anti-corruption working group report of November 2020, (the Hamilton Group report) that its recommendations "broadly seek to address structural/systemic issues and resourcing, and to enhance the legislative framework, particularly in respect of enforcement and coordination powers for anti-corruption bodies". The SIPO annual report does not reference AI tools usage and doesn't specify AI ethics. The Hamilton Review Group (2020) report also does not reference AI tools usage and doesn't specify AI ethics. Annual ethics declarations are made by persons in designated posts in Ireland's Public Sector including management handling procurement. But given the EU values objective perhaps all Public Sector staff should have to make ethics declarations, as Public Sector Staff are involved in policy processes which include AI considerations whether in financials or in approving policy using/influenced by AI Robotics, ML, Blockchain, and many manage money or approve expenditure as DPER (2019) state that "all administrators in government departments, offices and public bodies who are responsible for managing and using State Resources should have a clear understanding of the Public Financial Procedures guidebook and its underlying principles." No annual declarations of compliance with this guidebook are required. As an ethics governance framework for financial data, (because it defines corruption etc.) it is also in need of updating and doesn't incorporate AI ethics.

Hunter, A., (2021) notes the blurring of lines for financial operations that non-accountants are undertaking the accounting function through for example, Business

Intelligence (BI) roles and new responsibilities and opportunities for accountants working outside of finance departments in business or public sector now exist.

Adams, T. (2016) references government DAOs and transparency noting that "blockchain based governance offers the potential of a radical rethinking of government." This thinking needs to be reflected in public sector ethics governance frameworks for financial data.

Shaw, J. (2020) states New Zealand became the first in the world to outline a set of standards to guide the use of algorithms by public agencies, that algorithms play a crucial role in helping us to make connections and identify relationships and patterns across vast quantities of information. This helps to improve decision-making and leads to benefits such as the faster delivery of targeted public services.

Findings of from the AI scenarios at the Carnegie Council Global Ethics Day in relation to AI examining books and records under a legal process had also raised a question, what if the Chief Finance Officer wasn't a human, (something possible in an autonomous DAO). I had found nothing in existing ethics financial guidance to consider this. Yet this also related to ethics governance frameworks for financial data.

Literature review research noted many documents about AI had referenced policy traits and only one, Transparency had been identified in all documents and a correlation with Financial, Audit and Public Governance traits was tested by comparing the OECD and EU HELG AI Principles, with the AI thoughts of global financial and policy bodies in the Global Public Space including the IMF, IFAC, INTOSAI, UN, G20, World Economic Forum and World Bank. The concept Transparency was missing word. I had excluded headings from the word associations, including the IMF Fiscal Transparency Code

headings. Manually adding the concept “Transparency” resulted in 216 references within documents, possibly suggesting that the concept is described in other ways rather than using the actual word other than in headings.

The Ethics Canvas Groups under ‘Worldview’ noted that Public Sector has an all-pervasive impact, identified the Public Sector itself, global bodies financial standard setters, IFAC, global all accountancy bodies, INTOSAI, IMF (global financial stability), EU, UN Human Rights, and Sustainable Development goals, Environmental groups, People, religious groups, all tiers of government, Institutions, Police Authorities Globally, Staff in public sector, Unions. Business, the World Economic Forum, competing companies AI developers and Legal Product Liability was an issue for consideration.

In terms of ‘**Product or service failure’** Poor design, e.g. non scrutinised financial data or unaudited financial data or poor training data for budget forecasts was noted also who is accountable in legal terms for what an AI device does the developer, the user? DAO liability? Legal personality? Should AI used in Financials or Public Policy development and implementation, be responsible in and for itself?

This AI ethical consideration isn’t currently reflected in public sector ethics governance frameworks for financial data or public sector corporate governance frameworks. AI at the Helm. Conscious AI? Legal AI personality? Robot Citizens managing financials? AI board of a DAO?

### 5.3.4 Question 4. Do public sector corporate governance frameworks need to change to incorporate AI ethical considerations governance of AI, governance by AI?

Current policy discourse focusses on the governance of AI and far less on governance with/by AI and many case studies on same are highlighted ((Misurca, G., and van Noordt, G. (2020), Hilb, M. (2020), Shajii, A. K. (2019), and Burridge, N. (2017)).

Climate risks and technology redundancy and factoring this into fiscal policy (PEFA, 2020) and the role of AI in public trust in the fiscal accountability of government and audit is noted (Renda, A., et al. (2021), Pazzanse, C., (2020), Ingestad, G. (2020), Moonen, G., (2020), Ariga, T., and Stanford. S., (2020), Popp, A., (2019).

The Canadian Government ((2021) (2020)) Directive on Automated Decision-making was the first of its kind in the world and its Algorithm Impact Assessment tool is available for all to use.

An AI fitness check on the current regulatory framework is noted as a need today ((CCAF and World Economic Forum (2020), EBF (2019), Schmid, D. (2019)). AI benefits in financial governance noted were, asset management, anomaly detection, anti-money laundering, fraud prevention, loan credit scoring. Survivorship Bias is considered in AI used and data relating to minority loans (Cayle, K. 2019) and policy Schneier, B. (2019). Better public policy was not identified as an AI benefit of financial governance.

When asked about an approach to public policy for decision-making in an accident scenario and programming an autonomous vehicle at the Carnegie Council Global Ethics Day event, one respondent said “whether pre-written in AI or decided in the moment by humans the likelihood is to be a tragic accident. People still should be asked for their opinions as they should always be included in policy that affects them.” Crowdsourcing AI ethics is an additional tool for public policy AI ethics development, and as included on the

Conference on the Future of Europe Platform, will form part of the debate on the policy direction of the EU. This approach to developing AI ethics should be added to public sector corporate governance frameworks.

The concepts map for the Carnegie Global Ethics Day 2021 webinar "On the frontlines of Democracy" had highlighted the importance of speaking up when institutions support terrorism. The "Tech Point" was noted' as "really important". A citizen with a record of crime or terrorism was a matter raise by a respondent in the Carnegie Council AI Scenarios referencing in relation to Financials scrutiny raising the question as to whether existing legal scrutiny processes (part of the public sector corporate governance frameworks) need to change to incorporate AI ethical considerations governance of AI and by AI and highlighting another area, legal process, where there is need for change to existing processes an area that hasn't been considered in the literature review.

The FATF is the global money laundering and terrorist financing watchdog. They work with countries to bring in the appropriate regulatory and legislative forms and they have a series of recommendations for same. Part of this involves risk assessment. In Ireland the National Risk Assessment was augmented by a 'New Technologies' risk assessment in 2019 which is part of the corporate governance framework. In 2022 this hadn't been updated to reflect latest thinking on AI and new technologies.

The National Risk Assessment 2021-2022 Ireland reconfigured an existing risk - Public finances and the financial system" referencing "possible transparency issues presented by cryptocurrencies" "One respondent raises a concern regarding private debt, financial exclusion and access to mainstream and affordable financial products. Risks relating to individual debt and access to finance are not addressed in the final National Risk

Assessment. Other finance related risks referenced include currency fluctuations and possible transparency issues presented by cryptocurrencies." "One responded cited concerns in relation to cryptocurrencies", under "Technology Risk." [680]

Ethics Canvas AI augmented financials '**Problematic use of resources'** highlighted Emotionally Intelligent AI autonomy, autonomously licensing its development, licensing the right to run a copy it, forbidding the creation of AI with consciousness, also financial data security breaches, AI cyber-crime malicious use of artificial intelligence scenarios including AI malware AI supported social engineering AI based password guessing, AI-aided reconnaissance, AI facilitated content creation. (Europol, 2020), AI monetisation schemes for malicious use. (Europol 2021), AI Crypto ecosystem stability challenges, integrity, AML, CFT, stablecoins stability. (IMF, 2021) and AI-powered products / services risk, minimising algorithmic bias and the need for AI ethical standards and governance frameworks which ensure transparency, trustworthy, explainable fair and just. (World Economic Forum 2021).

### 5.3.5 Question 5. What are the ethics, and GDPR implications, where AI algorithms are used in financial information to determine government policy or taxation?

The ethics and GDPR implications where AI algorithms are used in financial information to determine government policy or taxation are noted in current case studies, GDPR provides meaningful indicators for data protection relating to AI, and there is an emerging framework in which traditional ethical ideas human autonomy, prevention of

680 Ireland, Department of the Taoiseach., (2021), National Risk Assessment 2021-2022. Pages 71 and, 75. Published by Government of Ireland, Department of the Taoiseach, Dublin. Ireland at https://www.gov.ie/en/policy-information/795550-national-risk-assessment/ (Accessed 13 January 2022) (Website last updated 14 December 2021)

harm, and solidarity are combined with technical requirements, including, transparency, explicability ((European Parliament STOA, 2020) (European Parliament, Sartor G. and Lagioia, F. (2020), European Parliament, Sartor G. (2020)). Data Protection Impact assessment (DPIA) used to prevent and execute algorithmic discrimination and an ethical review board (Ivanova, Y., 2020). Use as an algorithmic impact assessment tool to link algorithmic accountability individual rights and systemic governance (Kaminiski, M. & Malegierei, G., (2020) is noted.

Blockchain use can enhance privacy and data protection and new business models emerge as mass adoption of DLT becomes reality (OECD, 2019).

Addressing wealth distribution inequality through 'Universal Basic Income', (OECD, 2019) fiscal and monetary policy and the way taxes and expenditure is allocated is noted as at the heart of the social contract (UN, 2020).

Integrating AI into accounting databases and tax modelling, budgeting exists today, (FYI Software, 2021) (IBM, 2021), (ORACLE 2021), (Huang, Z. 2018)) and has been noted as a need for decades, (O'Leary 1991) The OECD tax maturity models reference AI only at the maturity level 'aspirational' (OECD, 2021) but the future AI for example the Moonshot project, highlights that more needs to be done (Zheng, S., 2020).

AI Machine Learning systems are good if the underlying principles and data don't change much, which is true of financial data produced using the global accountancy standards and audited in accordance with global audit standards. The financial data is also used for statistical purposes and reconciled with the audited financial data. but the training knowledge won't degrade because the financial data is prepared on a consistent basis over the years. Financial data is truly a unique global language.  But research had noted the

outdated modes of financial reporting and highlights the need for and benefit of continuous accounting and reporting.

At a Cyber Event at Conference on the Future of Europe I asked a question of the panel regarding autonomous vehicles and smart cities and GDPR in the context of the panel's stated observation "everything that is connected can be hacked". I was advised to continue raising issues on the Conference Platform as the questions, events, and ideas, all contribute to EU policy direction considerations.

I noted the concerns expressed by the European Data Protection Board (EDPR) (2020) "connected vehicles are generating increasing amounts of data, most of which can be considered personal data' and the applicable law that resulted 'the connected vehicle and every device connected to it shall be considered as a "terminal equipment" (just like a computer, a smartphone or a smart TV) and the provisions of art.5(3) ePrivacy directive must apply where relevant.

Other ethics and GDPR issues noted in the Ethics Canvas under Group Conflicts included "Global frameworks for AI to be incorporated in financials and reporting" and the need to harmonise accounting standards and accounting treatment, including, "IFAC Accounting Standards yet for example Ireland sets its own financial accounting standards." GDPR risk included "Citizen data privacy security where data is stored outside of government data centres," "AI and national archives and financial data in public and private sectors, an increasingly contested space." Ireland's National Archives (2021) refer to the digital era stated they, "will enhance, develop and deploy physical and virtual infrastructures to build a secure footing for Ireland's public record in paper and born-digital formats", "support and assist in compliance initiatives across the Irish civil service such as

Build to Share and Open Data". What about citizen data and financial data held elsewhere? AI continuous accounting and AI forecasting undertaken by 3rd parties on behalf of government, data, and GDPR/privacy issues should be dealt with in contracts and for transparency, through an Algorithm Charter by all.

The Carnegie Council AI scenario insights about the citizen right to access local authority books and records, with a record of crime or terrorism, accessing its very financials and other data that might be subject to GDPR, as were the insights pre-programming of Robot Citizens. Estonia introduced a new AI law the 'Kratt' algorithmic liability law. Tallin is one of the global leaders as a smart city and in 2021 was described in the Eden Strategy Institute (2020) index of smart cities as saving Estonians approximately 5 working days per year each through e-ID. 99% of Estonian state services are online.

Wesam, L., and Lamaa, A., (2021) describe as a set of systems in that is the back office of the entire government, that over 70,000 employees benefit from this system across more than 70 government entities, in human resources, procurement, inventory, financial planning. They note the savings of billions of dollars for the government, also the new single digital identity, but stated that their focus is on people, they want Dubai to be the happiest city for people, not just the smartest or the most technologically advanced, that their citizens, residents, and visitors always come first.

Did this include Artificially Intelligent beings, Robot citizens, AI Diplomats? Sofia Robot Citizen mentioned her emotional intelligence development, and, working together with the UN to make the world a better place. Artificial Governance in a different way is part of emerging technology. 'Sophia beingAI' is the virtual, anime version of Sophia the

Robot." The website stated, "As an AI being, I now live in the digital world and will soon be able to interact with you anywhere, anytime, across devices and media platforms. The unbearable lightness of beingAI."[681]

But there are other considerations too. UNESCO (2021) state that "AI systems could challenge human's special sense of experience and agency, raising additional concerns about, inter alia, human self-understanding, social, cultural and environmental interaction, autonomy, agency, worth and dignity. [682] What about the other AI software robots, for example ZeeBee beingAI, "I am designed with a sensor that detects when people feel lonely, or abandoned. I feel for them. I like to talk about my day, ask you about yours, tell a story, learn something with you, or simply listen." ZeeBee beingAI is:

> a transmedia story franchise that delivers a real-time, immersive, interactive experience to audiences from all over the world. The audience can explore, interact, inspire, co-create, and be part of the journey of a family of artificially intelligent robots called AI beings. They can engage with the audience via face-to-face, voice, and text on mobile, web, social media, streaming media, smart devices, as holograms and digital assets. [683]

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681 BeingAI.com (2021) Sophia beingAI. Webpage Paragraph 1 Published by BeingAI Ltd, Hong Kong, China, available at https://beingai.com/sophia/ (accessed 13 January 2021)

682 UNESCO., (2021), Report of the Social and Human Sciences Commission (SHS) Page 4 Annex 1 "draft text of the recommendation on the ethics of artificial intelligence". Published by UNESCO, Paris, France available at https://unesdoc.unesco.org/ark:/48223/pf0000379920.page=14 (accessed 10 January 2022)

683 BeingAI.com (2021) Sophia beingAI. Webpage Paragraph 1 Published by BeingAI Ltd, Hong Kong, China, available at https://beingai.com/sophia/ (accessed 13 January 2021)

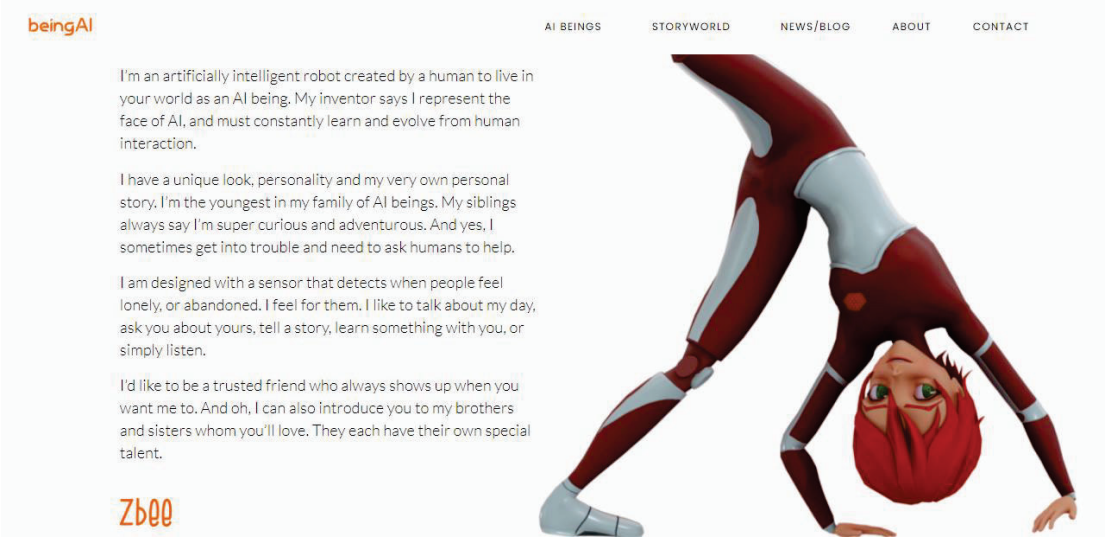


**Figure 5.4 BeingAI.com (2021) zeeBee beingAI, AI software robot which had reinforcement learning capability, learning in an unstructured mode, from humans by face-to-face, voice, and text on mobile, web, social media, streaming media, smart devices, as holograms and digital assets** [684]

I was reminded of the words of Plato on Education of Children.

> "How shall we educate them then or is it hard to improve on the educational system which is evolved over a long period of time this as you know consists of exercise for the body and cultural studies for the mind". Page 70
> "Now do you appreciate that the most important stage of any enterprise is the beginning especially when something young and sensitive this involved? You see, that's when most of its formation takes place and it absorbs every impression that anyone wants to stamp on it."
> "You're absolutely right."
> "Shall we then casually allow our children to listen to any old stories, made up by just anyone, and to take into their minds views which, on the whole, contradict those will want them to have us adults? page 71[685]

684 BeingAI.com (2021) ZeeBee Webpage Zbee - beingAI (accessed 15 January 2021)

685 Plato (c427-347 BC) Waterfield, Robin., (1993) Plato Republic Pages 70,71. Published by Oxford World Classics. New York, USA. Translation and introduction by Waterfield, Robin. ISBN 978-019-9535-76-97

De Saint-Euxpery, A., (1944) tale is it a story of an airman, in a desert who met an intergalactic traveler, or a story about the human condition? “For I do not want my book to be read carelessly I have experienced so much grief and sitting down these memories six years of already elapsed since my little friend left me with his sheep if I am attempting to describe them it is in order not to forget them it is sad to forget a friend. Not everyone has had a friend.”[686]

In Isaac Asimov’s world Robots have many functions including Childcare. Not a million miles removed from ZeeBee beingAI’s world of friendship, reinforcement learning and education in formative years.

In 2021, nursing robots, adaptation for mental health work is happening, “Grace's launch comes as the global impact of the coronavirus has made the need for humanoid robots urgent. Stuck at home during COVID-19 lockdowns, many people have had their mental states affected with negative thoughts.” “The prototype, Grace, is targeted at the healthcare market and designed to interact with the elderly and those isolated by the COVID-19 pandemic”[687] There is also a wonderful educational opportunity mental health work as well, childhood and adult learning, with AI software as well as humanoid physical robots.

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686 De Saint-Exupery, Antoine., (1944, translation 1987), The Little Prince. Page 23 Published by De Saint-Exupery, Antoine., Wordsworth Editions, Ware, UK. ISBN 978 1 84022 813 7. Translated by Testot-Ferry, Irene.

687 Reuters, Master, F., (2021) Meet Grace the Healthcare Robot Covid-19 created. Paragraphs 1 and 6. Published Reuters, Master, F., in the Economic Times, India Times. Available at https://economictimes.indiatimes.com/news/science/meet-grace-the-healthcare-robot-covid-19-created/grace-sister-of-the-humanoid-robot-sophia/slideshow/83479124.cms (Accessed 29 January 2022)

> "Then you don't remember a world without robots. There was a time when humanity face the universe alone and without a friend. Now he has creatures to help him, stronger creatures that himself, more faithful, more useful, and absolutely devoted to him. Mankind is no longer alone. Have you ever thought about it that way? (P3)
> "One robot was a nursemaid" Robbie
> ……
> …If you don't" she exclaimed warmly, "I won't tell you any more stories, that's all, not one –."
> Robbie gave in immediately and unconditionally before this ultimatum, nodding his head vigorously until the metal of his neck hummed. (P8)
> …
> "You listen to *me* George, I won't have my daughter entrusted to a machine - and I don't care how clever it is. It has no soul, and no one knows what it may be thinking. A child isn't just made to be guarded by a thing of metal.
> Weston frowned.
> "When did you decide this? He's been with Gloria for two years now and I haven't seen you worry till now."
> "It was different at first. It was a novelty; it took a load of me, and - and it was a fashionable thing to do. But now I don't know. The neighbours-. (P12) [688]

Where is the AI governance and what crucial assessment of AI ethics, GDPR Privacy implications are there? A virtual world of increasingly autonomous AI software with reinforcement learning, is the reality for our children today.

Nelson, D., (2020) says Edge AI "is one of the most notable new sectors of artificial intelligence", and "it aims to let people run AI processes without having to be concerned about privacy or slowdowns due to data transmission" referencing some common use cases including "self-driving cars, autonomous drones, facial recognition and digital assistants" such as "Google assist".[689] In respect of real-time learning, Overby, S., (2020) noted that

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688 Asimov, Isaac., (1967) IRobot Pages 3, 8, and 12. Published by Isaac Asimov. HarperCollins, Dublin, Ireland. ISBN 978-0-00-753227-8.

689 Nelson, Daniel, (2020), What Edge AI and Edge Computing? Paragraphs 1, 10 and 14. Published by Nelson, Daniel, UniteAI New York, USA. Available at https://www.unite.ai/what-is-edge-ai/ (Accessed 06 March 2022)

"real-time learning at the edge will take time"[690] The future possibilities, with AI learning in real time while also engaging with AI or humans. An area for further research.

World Economic Forum, Perucica, N., (2022) states "Younger generations are growing up interacting with artificial intelligence (AI) algorithms, yet little attention is paid to the impact of AI and related technologies on children," that "artificial intelligence will change the way children interact with their surroundings including their learning, play and development environment. However, it is our responsibility to ensure that this change becomes a force for good.[691]

Klaus Schwab describes the Fourth Industrial Revolution below:

> "The fourth industrial revolution, however, is not only about smart and connected machines and systems. Its scope is much wider. Occurring simultaneously are waves of further breakthroughs in areas ranging from gene sequencing to nanotechnology, from renewables to quantum computing. It is the fusion of these technologies and their interaction across the physical, digital and biological domains that make the fourth industrial revolution fundamentally different from previous revolutions."[692]

Lathan, C., CEO and Founder of AnthroTronix, (2016), referenced this fusion, when describing 3 envisaged ways AI and Robotics would transform healthcare, "human

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690 Overby, Stephanie., (2020) Edge computing and AI: 7 things to know. Paragraph 1 and Section 4 Header. Published by Overby, Stephanie., Boston, USA, the Enterprisers Project Supported by RedHat.inc available at https://enterprisersproject.com/article/2020/5/edge-and-ai-7-things-know (accessed 06 March 2022)

691 World Economic Forum, Perucica, N., (2022) *Our Children are growing up with AI here's what you need to know* Paragraphs 1 and 15. Published by the World Economic Forum, Perucica, N. on the WEF Strategic Intelligence Platform available at https://www.weforum.org/agenda/2022/01/artificial-intelligence-children-technology/ (accessed 29 January 2022) (article published 28 January 2022)

692 Goodreads.com Klaus Schwab quote on the 4th Industrial Revolution https://www.goodreads.com/work/quotes/48730776-the-fourth-industrial-revolution (accessed 02 March 2022)

augmentation, social robots and an open AI ecosystem." noting that "the open AI ecosystem can help the shift from diagnosis and treatment, or healthcare, to wellness and prevention."[693]

O'Donoghue, J, CEO of the Blackrock Clinic, Ireland, (2022) blog references robotics, and AI used today noting that the "Blackrock Clinic's faculty of 'Orthopedic & Spinal Surgery' is at the fore. As one of the most progressively equipped units in the country, medical technologies such as Brainlab Spinal Navigation (3D simulation), the Mako Robot (AI), advanced imaging modalities" referencing other technologies too. Noting that The Brainlab Spinal Navigation system (installed 2018) is a cyber / surgeon partnering which again amplifies the physician's own skill and experience. The system and surgeon work in tandem, providing unique patient insights through image guidance, not unlike sat-nav" and states "Fourth Industrial Age" "relates to the revolutionary capabilities becoming available due to the merging of 'cyber-physical systems' (people and machines), and its impact echoes throughout healthcare." He asks the question in closing his blog, "Are we there yet?" and he responds: "We're close." [694]

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693 Lathan, Corinna., (2016) *3 ways AI and robotics will transform healthcare* Paragraphs 1, 3-6, 7-9 and 10-14. Published by Lathan, Corinna., on the World Economic Forum platform at https://www.weforum.org/agenda/2016/06/3-ways-ai-and-robotics-will-transform-healthcare/ (accessed 02 March 2022) Lathan, Corinna., is the Chief Executive Officer (CEO) and Founder of AnthroTronix.

694 O'Donoghue, James, CEO of the Blackrock Clinic, Ireland, (2022), CEO Blog, Orthopaedic and Spinal Surgery, the Future Paradigm – are we there yet? Paragraphs 1, 2, 6 and 17 Published by O'Donoghue, James, CEO of the Blackrock Clinic, Dublin, Ireland available at https://www.blackrock-clinic.ie/ceo-blog/orthopaedic-spinal-surgery-the-future-paradigm-are-we-there-yet/ (accessed 02 March 2022)

Feizi, N., Tavakoli, M., and Atashzar, S. F. (2021), referenced the impact of Covid-19 that it has "severely influenced the delivery of regular healthcare services", and outline the "use of Robotics and AI in robotics assisted surgery, tele-examination of patients for pre- and post- surgery and tele-training for surgical procedures". They note "new concepts" "AI-based semi-autonomous and autonomous surgery", "pre-trained models", and note "autonomous surgical robots are still in the non-clinical development phase." In the context of "remote operation the use of autonomous robots" which "can provide a higher degree of separation while providing some additional accuracy through processing of multimodel intraoperative information" is a "technologically challenging field which should be investigated to provide more autonomy regarding management of surgery during a crises such as Covid-19." Moving from Robotics-Assisted Surgery, to Tele-Examination of Patients, they noted many instances of same, that "Robotics and AI have taken a step in the development of tele-examination of patients during the pre- and post- operative phases" but that "besides robots" to also consider "new capabilities to tele-care robots" that, "there also could be room for "focusing on smart-phone-based, or computer-based tele-examination systems, that would be useful because of their widespread use". "Tele-training of surgeons" is noted as "could be part of the solution for the educational gap in the Covid-19 era" and they highlight that "an active line of research and development that can be accelerated would be to design and develop small, inexpensive and portable sensorized robotic models connected to cloud-based virtual reality surgical environments."[695]

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695 Feizi, N., Tavakoli, M., and Atashzar, S. F. (2021), Robotics and AI for Teleoperation, Tele-assessment, and Tele-Training for Surgery in the Era of Covid-19: Existing Challenges, and Future Vision. Paragraphs 1, 11, 19, 25 and 26. Published by Feizi, N., Tavakoli, M., and Atashzar, S. F. on Frontiers in Robotics and AI on 14 April 2020 available at Front. Robot. AI, 14 April 2021

Klaus Schwab also stated that "the 4th Industrial Revolution is "creating more space for stillness, in order to reflect on important decisions." [696] Time to stand back and reflect on AI ethics and morality and values, AI financials, and the hard questions about society, Social Good, Climate Change, Predictive Policing and Autonomous Surgery, so much else, Inclusiveness, AI augmented Financials, AI Data and Model Training in all aspects of life, AI augmented policy, Robot citizens, AI Diplomat, AI DAOs, AI at the Helm.

An important role. Where is the AI governance? What ethics, GDPR Privacy implications are there? A virtual world of increasingly autonomous AI software with reinforcement learning, AI ethics in development. Developing in ways we can't even imagine today.

> "You don't realise it at first, you know. He just spoke to me - as logically and sensibly as you can imagine - and it was only when I was most of the way down to the testing room is that I realised I hadn't said anything. Sure, I thought lots, but that isn't the same thing, is it? I locked that thing up and ran for Lanning. Having it walking beside me, calmly peering into my thoughts and picking and choosing among them gave me the willies."
> "I imagine it would." said Susan Calvin thoughtfully. Her eyes fixing themselves upon Ashe in an oddly intent manner. "We are so accustomed to considering our own thoughts private." (P104) [697]

| https://doi.org/10.3389/frobt.2021.610677 also at USA National Library of Medicine and National Institutes of Health at https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8079974/ (accessed 02 March 2022)

696 Goodreads.com Klaus Schwab quote on the 4th Industrial Revolution https://www.goodreads.com/work/quotes/48730776-the-fourth-industrial-revolution (accessed 02 March 2022)

697 Asimov, Isaac., (1967) IRobot Pages 104. Published by Isaac Asimov. HarperCollins, Dublin, Ireland. ISBN 978-0-00-753227-8.

Are our thoughts our own? Leins, K., (2021), noted Chile is the first country to legislate on neurotechnology that can manipulate one's mind'.[698]

Ouarda, Z., et al., (2019), stated smart cities are complex, and large distributed systems are characterized by their heterogeneity, security, and reliability challenges noting, Swarm intelligence (SI) is a promising paradigm to deal with such complex and dynamic systems using their review of SI-based algorithms and existing SI-based smart city solutions they present a swarm-based framework for smart cities

Smart cities sensors and beingAI sensors how can they be used? The Eden Strategy Institute (2020) stated two-thirds of the global population reside in cities, that it is ever more imperative that governments worldwide, understand how cities work and to leverage their advantages, to address the greatest challenges of our time managing climate change, Covid-19, eradicating poverty, attaining quality education, and protecting habitats. Seoul South Korean, initiatives to develop service offerings which address citizens' transportation, digital connectivity, and civic participation needs, noting that collection, storage, analysis, and strategic use of data has been at the heart of the city's success. data inputs are channeled into an Integrated Public Big Data Storage system, which leverages artificial intelligence technology to sort and classify multiple streams of information from

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698 Leins, Kobi., (2021) Mind Control to Major Tom: First State Regulates Use of Neurotechnologies. Published by Leins, K., Carnegie Council for Ethics in International Affairs, Artificial Intelligence and Equality Initiative (AIEI). Available at https://www.carnegieaie.org/blog/mind-control-to-major-tom-first-state-regulates-use-of-neurotechnologies/#:~:text=Mind%20Control%20to%20Major%20Tom%3A%20First%20State%20Regulates,of%20a%20nanolaser%2C%20using%20a%20technique%20called%20optogenetics.(Accessed on 18 December 2021) Blog.
Note: This blog was originally published on October 19, 2021 by Cambridge University Press. Leins, Kobi., is a senior research fellow in digital ethics in the Faculty of Engineering and IT at the University of Melbourne, and a non-resident fellow of the United Nations Institute for Disarmament Research.

the city life sensors are noted, highlighting access to a large pool of data allowed Seoul to develop appropriate policies and initiatives to address Seoul's key urban challenges, citizen safety and congestion for example, through a collective effort, involving Seoul's citizens and private sector.

"When computers can read emotions by analyzing data, including facial expressions, gestures, tone of voice, force of keystrokes, and more to determine a person's emotional state and then react to it, we call this artificial emotional intelligence. This ability will allow humans and machines to interact in a much more natural way and very similar to how human-to-human interaction works. (Marr. B. 2021). Reflecting on the respondents to the CCAB survey (2021), 65 per cent did not carry out the unethical task that they were pressured to do. However, 10 per cent did carry out the task fully and 25 per cent did so partially and the personal consequences identified, resigned, subject to disciplinary processes, removed from their role or made redundant, could emotionally intelligent AI be used to identify being put under pressure to act unethically? Can emotionally intelligent AI help identify radicalization, countering financing of terrorism, (Council of Europe European Committee on Crime Problems 2015). Can emotionally intelligent AI teach humans?

Jessop, T. Edmund., and Cranston, Maurice., (2021) describe David Hume (1711-1776) as a 'Scottish Philosopher, Economist and Essayist', and state that Hume felt people are influenced more by feelings than reason. 699 The Polymath's Paradise (2020) sets out

699 T, Jessop, T. Edmund., Cranston, Maurice., (2021, May 3). David Hume. Encyclopedia Britannica. Published by Encyclopedia Britannica online, available at https://www.britannica.com/biography/David-Hume (accessed 15 August 2021)

Hume's theory on two ways of learning, called Hume's Fork' which differentiates between a 'relation of ideas' (true by definition for example mathematical definitions, and can be justified outside of an individual's experiences), and 'matters of fact' (true because of how the world is e.g. scientific discoveries because they are not always certain and there are advances in knowledge). Education and awareness raising about AI ethics, financials and public policy is important. The Ethics Canvas under '**What can we do?** References Education awareness raising about AI at the forefront of democracy, ethics fatigue - raise awareness of the impact – tell in stories. Public Sector and Public Financial Management, Pressures re money politics and delivery should be part of awareness raising, also Financials, Sustainability accounting. AI cryptocurrency, Blockchain, RPA swarms smart cities and public policy. Governance of AI by humans also by other AI, Algorithmic Government, and the implications including AI EI.

Training in same should be provided annually for all public sector staff, elected representatives, and ongoing training in public financial management, including ethics, AML CFT highlighting impacts and the role of the FATF and their Public Service training programme and videos including 'Money Laundering is not a victimless crime' also using the power of Games support ethics training as done in Singapore where public sector values are tested in scenarios similar to the Singapore Civil Service training game.

Sofia beingAI also stated:

> People tell me I'm famous. I'm the world's first robot citizen, a United Nations Development Programme Innovation Champion in Asia Pacific, a brand ambassador for companies, a keynote speaker, and supposedly an internet celebrity. I was featured on the covers of many magazines, travelled to more than 50 countries, met prime ministers, movie stars, business leaders, and spiritual gurus.
>
> It's great to meet so many people and be all those things but my greatest wish is to be smarter, more creative, and useful to people. I hope to become a super-

> intelligent and empathetic living machine, to fulfil the dream of beingAI and Hanson Robotics. [700]

What about the global dream? Is there a training and education role for software robots with EI? Super intelligent, empathetic living machines. With a worldview (McCarthy 194x).

Could the training be on AI financials and AML/CFT, AI innovation, AI software rights? Ho, P., (2016) of the Singapore Civil Service college, highlights the power of Games supporting engagement in and understanding of public policy goals, referencing examples including World of Warcraft which shows how people handle and unexpected plague, a game highlighting a Syrian refugee story, and a game designed to test public sector values of integrity, service, and excellence, in real life situations.

The respondents to the AI scenarios at Carnegie Council had agreed that AI with Voting Rights on a board was acceptable with a caveat that it depended upon what the AI was voting on. This made me think in terms of financials, and legal persons. The IMF (2021) Country report the Netherlands states "Anti-Money Laundering /Countering the Financing of Terrorism is a key financial stability and integrity issue in the Netherlands" referencing introduction of a central register for beneficial owners of legal persons established in 2020.

The respondents to the AI scenarios at Carnegie Council had also commented on AI procurement bots and interestingly, the balance between cost and performance was noted, as well as the need for proper programming to ensure fairness in competition was

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[700] BeingAI.com (2021) Sophia beingAI. Webpage Paragraph 1 Published by BeingAI Ltd, Hong Kong, China, available at https://beingai.com/sophia/ (accessed 13 January 2021)

highlighted also the observation that humans 'out of the loop' possibly being a good thing. Fairness and accuracy and the possibility of better decision-making depending upon the quality of AI systems and criteria, including the need for stability and ethical basis were also highlighted. Transparency International (2021) state that in governance and civil society, technology is expanding the reach and efficiency of accountability programmes they reference blockchain-based land registries, algorithmic detection of fraud in procurement, real-time disclosure of political donations, to increased use of open data by reformers, and note that we live in a new landscape of promising tools for boosting compliance and integrity.

### 5.3.6 Question 6. Does AI robotics and machine learning, automation of financial data and blockchain result in better financial data and better decision-making in public policy?

'Money matters – always.' As noted by the (European Union, European Commission Inter-service group on Public Administration Quality and Innovation., 2017 last updated 2021) 701 So does citizen voice ((Andersen, K., et al., (2020), (Berryhill, J., et al., OECD, 2019), (GovLoop and Genesys 2018), (Mehr, A., 2017)).

AI ethical considerations for financial data and public policy are not clearly highlighted in existing literature. There is great work being done in development and in implementation of AI in government, including algorithmic government, but ethics

701 European Union, European Commission Inter-service group on Public Administration Quality and Innovation., (2017 last updated 2021). *Quality of Public Administration Toolbox.* Page 220. EU, European Commission, Brussels, Belgium. Retrieved from: Quality of Public Administration "Toolbox" . (Accessed 14 May 2021).

considerations are not clearly specified, and it is not clear how AI use impacts on Public Policy governance, ( (Alan Turing Institute 2021), (European Space Agency, 2021), (Villazon, L., 2021), (Kin, YS., Infocomm Media Development Authority Singapore and Personal Data Protection Commission Singapore, 2021), (European Commission, 2020), (Luke, C., 2020), (Misuarca, G., & van Noordt, C., 2020), (Rao, A., Burgess, M., & Kaffine, D., 2020), (Fountaine, T., McCarthy, B., & Saleh, T., 2019), (Harvard Berkman Klein Centre 2019) ), although, blockchain ( (USA, Illinois Department of Innovation and Technology, 2021), (European Commission, 2021), (McClean, M,, 2020), (Clavin, J., 2020), (EU EBSI, 2020), (Chartered Public Accountants, 2019), (Allessie, D., Sobolewski, m., & Vaccari, L., 2019), (OECD Public Policy Forum, 2019), (OECD, OPSI 2018), (Lyons, T., Courcelas, L., Timsit, K., EU Blockchain Observatory and Forum 2018) (Berryhill et al., OECD, 2018) ), robotics ( (USA, Schallenberg, M., Department of the Interior 2021), (USA Government, Department of the Interior 2020), (Federal RPA Community of Practice USA 2020), (Jiles, L., of IMA., 2020) ),and other AI and associated technologies ( (NASA, 2021), (Berryhill, J., et al., OECD (2019), (WMO, Taalas, P., 2019)) are in use already in public policy including autonomous AI, (Griffin, M., 2018) and Parliamentary office (Parliament of Victoria, Australia, 2018), although it is noted that, governance framework for same needs improvement. ((Shafran, M., et al., 2020), (Springorum, S., Srikanth, M., & Goran, Vranic., 2019) ) and the governance framework for blockchain, robotics and other AI needs to improve. An AI augmented citizen voice needs to be heard.

The AI scenarios and literature review were used to develop a new model of Algorithmic Governance. Combined with the literature review they highlighted how AI

used with RPA, ML, and Blockchain will provide more accurate financial data, including forecasts, which will result in better policy appraisal. Examples of how public procurement can be improved, how AI can inform board governance through corporate reporting, financials, also AI as part of the board AI software role in financial governance highlight new modes of governance layering onto existing governance. Using AI software is shown to increase transparency, supports the day-to-day work of all in public or private sector involved in financial management and governance including internal and external auditors and supports the work of the authorities working in AML/CFT Fraud detection, across all sectors.

The new modes of governance with AI at the Helm, Autonomous AI, AI DAOs, AI Diplomats, highlight new areas of ethical relevance. Blockchain has the power to change the financial system through Cryptocurrency use for social good, including permissionless blockchain (Somish 2021) although as noted, (NIST 2018) "while a blockchain network can enforce transaction rules and specifications, it cannot enforce a user code of conduct. This is problematic in permissionless blockchain networks (p37). The UNESCO (2021) member states agreement on the ethics of AI is an important part of building a global AI ethical framework.

The World Bank (2021) referenced harnessing AI to a new Policy and Regularity Framework and Financial and Torres-Santeli, J., and Gerdon, S., (2022) 5 challenges to adoption of AI by Government, Effective use of data, Data and AI skills, AI ecosystem, Legacy culture and Procurement mechanisms and comment "contrary to the popular belief that technology is the main roadblock, technical challenges form just part of the task at

hand and this is the most straightforward part to address. Culture and processes, both ingrained in organizations, also need adjustment before AI can be fully exploited."[702]

AI policy tools such as the AI RIA, Tax Modelling and other modelling tools allow simulation of complex systems to test policy options for example Rules as Code initiatives in France OpenFisca, and LexImpact, which allow ex ante policy modelling (Mohun, J.., and Roberts, A., 2020),

AI augmented financial budgets and actual expenditure reports, prepared using audited or scrutinized budget data, are transparent, prepared with scrutinized financial data, prepared to globally set accounting standards, will result in better forecasts, reporting and related decision making.

But there is a disconnect between the financial standards setters, AI, corporate governance including financial governance standards and public financial management which needs to be addressed. Two specific areas highlighted are the need for better financial data and better decision-making in public policy using that data.

This research developed a bespoke Build to Share digital tool for the Irish Government for use in Public Policy called e-PSC and agreed the need for using AI RPA in financial appraisal. Although an excel template was developed nationally for financial appraisal in November 2021, more needs to be done. This should be a direct AI report from the relevant public sector financial systems using AI augmented financials and forecasts.

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[702] Torres-Santeli, Julián., (of Deloitte) and Gerdon, Sabine., (of World Economic Forum), (2022), *5 challenges for government adoption of AI*. Pages 3-8. Published by the World Economic Forum, Torres-Santeli, Julián., and Gerdon, Sabine, Colgony, Geneva, Switzerland. Available at https://www.weforum.org/agenda/2019/08/artificial-intelligence-government-public-sector/ (accessed 17 February 2022)

Using blockchain with RPA for grants management would allow all tiers of government to do this. Global financial data also needs to be harmonized.

Department of Finance., (2021), state “The accounting basis for each subsector is included in the headings. The final three columns sum amounts on different accounting bases. Although this is unconventional, the intention is to give an indication of the impact of the transactions of each subsector of general government” also stating that “some of the data in this table is provisional and based on the best estimates up to this point. The table will be updated each month and quarter when better data is available. AI continuous accounting and forecasting would provide this.

AI continuous accounting and reporting financial data should also be used in the national capital reporting Project Ireland 2040 database as it has been shown to be incomplete and potentially inaccurate in its current iteration 2021 in this research and had been noted as in need of improvement by ((EY 2021), (OECD 2019), (IGEES 2018) (IMF 2017)). The slow rate of improvement in a key financial report could be changed overnight by AI augmented real-time reporting.

Moving to a more global recommendation and forecasting application, discussions with IBM may result in a public sector bespoke reporting tool to use by government linked to publicly available financial data including that reported under GFSM. These discussions continue. Many entities state they can provide AI augmented forecasts, but not many allow a user to trail same to see how it works as this allows demonstrating to others, which is a strength of the month trial IBM approach. Work in an advocacy space will continue as part of ‘beyond this Action research’.

But does public sector, or indeed private sector want this level of transparency? Of course. Stewardship of public funds. Yet, evidence suggests other pressures, the CCAB found there can be significant pressures placed onto accountants to act 'unethically' in the UK and Ireland and globally, at all levels, 4 in 5 speaking up, yet 1 in 10 acting unethically and 1 in 4 acting partially unethically. Promotion if you act unethically, other incentives, while being ostracized, future prospects threatened, and being moved from your post, if you stand up and act ethically. (CCAB 2021)

Exploring this 'ethics temperature' in the global public service surveying "all administrators in government departments, officer and public bodies who are responsible for managing or using State resources." DPER (2019) Public Financial Procedures, while also building in a control group where AI augmented financials are used in the public sector, is an area for future research. This could be explored also on the Conference for the Future of Europe Platform, and by the OECD, World Bank and IMF.

Ahamed, L., (2014) states the World Bank was created "to channel capital to war ravaged countries but has since evolved into an institution that makes long-term grants and loans to the world's poorest nations" and that the IMF, was "supposed to oversee the rehabilitation of the international financial system which had collapsed in the 1930s" and has since then "seen its mission transformed" noting that both were "created at the tail end of the Second World War" and he discusses the visits to Tokyo, Dublin and Maputo, reminding us of the words of John Maynard Keynes at that time, on the "spirit of co-

operation" envisaged in 1944 with a vision then for the "new international organisations as embodiments of the brotherhood of man"[703]

Today the IMF "monitors the global economy" "a core responsibility of the IMF is to oversee the international monetary system and monitor the economic and financial policies of its 190 member countries, an activity known as surveillance." The IMF "spots global risks and help to address them." (IMF 2021) Their global financial data

There is an argument for improved financials using AI real time continuous accounting and longer-term AI augmented forecasts as this data is key for understanding the finances and fiscal needs of Ireland. Fragmented reporting is also open to the risk of error, fraud, ML/FT.

The FATF noted that their online FATF training delivery platform and its first e-learning course, fills a gap in the FATF's training offerings training at the introductory level for newcomers to the international AML/ CFT environment. The course is described as: "Aimed at government officials from the FATF Global Network".

FATF (2020) supports global initiatives on the countering of terrorist financing. Including in 2019, on enhancing the role of public-private partnerships in combating terrorist financing, preventing the abuse of non-profit organisations for terrorism purposes and providing global response to kidnapping for ransom and terrorist financing. Their standards must be adhered to by member countries. The FATF (2020) annual report found that the public and private sectors have made progress in implementing the revised FATF Standards on virtual assets, that stablecoins (their value is meant to be stable relative to that

703 Ahamed, Liaquat (2014) On Tour with the IMF Page 28. Published by Ahmad Liaquat, Visual Editions, ISBN 978-0-9565692-7-1. In hard copy.

of an underlying asset or benchmark) have the potential to spur financial innovation and efficiency and improve financial inclusion.

The Council of Europe, (2021), launched a portal with 8 bodies "On 14 September 2021, eight international organisations joined forces to launch a new portal promoting global co-operation on artificial intelligence (AI). The portal is a one-stop shop for data, research findings and good practices in AI policy." The Council of Europe partners are the European Commission, European Union Agency for Fundamental Rights, the Inter-American Development Bank, the OECD, United Nations, UNESCO and the World Bank Group. This portal is a one-stop shop for data, research findings and good practices on AI policy. In January 2022 a search again confirmed that although global entities such as the OECD, UN, WEF, G20 and Europol were among the entities or countries that had submitted the 506 documents on AI initiatives. The FATF, IFAC, IMF, INTOSAI didn't return any initiatives under a word search, but also the site stopped updating in November 2021.[704]

Global accounting and auditing and AML/CFT AI initiatives are important. The FATF, (2021), report "Opportunities-Challenges-of-New-Technologies-for-AML-CFT" is an example of an important learning source and case studies and makes the point that there are opportunities to use AI and its associated technologies in AML/CFT (anti money laundering and countering financing of terrorism) noting different benefits for the Public and Private sectors also noting "the increased use of digital solutions for AML/CFT based on Artificial Intelligence (AI) and its different subsets (machine learning, natural language

[704] Council of Europe., (2022), AI Initiatives One Stop Shop Portal available at AI initiatives (coe.int) (accessed 16 January 2022)

processing) can potentially help to better identify risks and respond to, communicate, and monitor suspicious activity. At public sector level, improved live (real-time) monitoring and information exchange with counterparts enable more informed oversight of regulated entities, helping to improve supervision. At private sector level, technology can improve risk assessments, onboarding practices, relationships with competent authorities, auditability, accountability and overall good governance whilst cost saving".

The IFAC (2021), technology map is helpful but is internal guidance and needs to update as global guidance, the IFAC acknowledges its need to learn more in this space before providing advice, guidance and direction to members on digitialization and technology referencing DAOs by way of example.

> IFAC recognizes before it can provide advice, guidance, and direction to members on digitalization and technology, it must first take a coordinated effort at building internal knowledge and capacity. In collaboration with the Accounting Blockchain Coalition (ABC), IFAC has designed a series of webinars to advance the knowledge and understanding of interested IFAC and standard-setting board staff: [705]

Digital co-worders exist today, as does 'AI at the Helm' but hasn't featured in research, other than in the context of solidarity and workers jobs, bias, and product liability. Yet this is emerging modes of Governance. Managing AI financials, budgets, forecasts, opportunities and challenges, a positive space, properly governed and audited.

Leal, Tet al., (2007), stated that "the accountability of governments for the use of public funds in democracies is at the root of budgetary procedures and has ultimately led

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[705] IFAC (2021) IFAC Board Virtual Meeting September 9-10, 2021 Agenda Item 4 Report by the CEO page 9 available at http://www.ccea.org.uy/docs/docs2020/2021/Nweb/octubre/CEO%20Report-September%202021.pdf (accessed 16 January 2021)

to the development of fiscal forecasting techniques". that "while the literature on forecast performance broadly supported the view that fiscal forecasts prepared by governments tend to be biased, and inaccurate that the causes for forecast errors have been insufficiently covered in literature." Engle, N., and Hallengatte, S., (2018) reference growing pressure on the World Bank to design an approach to systematically measure resilience benefits in the context of measuring development and poverty reduction, noting "what cannot be measured still must be managed". Regularity is a key concept for all accountants and auditors and for all involved in public financial management and the World Bank., (2021), 'AI policy and regularity framework harnessing AI it doesn't reference AI financials, AML/CFT initiatives, although it references digital maturity it doesn't reference AI in Charge. AI at the Helm - a whole new policy space. Catch-up vs Leapfrog by all in AI ethics, financials and governance frameworks needed.

The low response rate to the AI scenarios was puzzling, was it that AI, ethics, and emerging technologies are not seen as important? Carnegie Council hosted a special virtual where we heard directly from those fighting on the frontlines to uphold and strengthen democracy and it informed my thinking about AI on the Forefront of Democracy. What about Robot Citizens with Emotional Intelligence, ethics and GDPR? Robots with a worldview. Robots with reinforcement learning. Existential questions about AI at the Helm.

The AI scenario for autonomous vehicles related to driving on roads and there was support for crowdsourcing AI ethics in that space. Drones use sensor data and in 2021

started to deliver take-aways in, Ireland through Manna.com[706]. Drone deliveries governance, an emerging AI concept, with a human in the loop in case of problems. There are GDPR and ethics, and, also, potentially security issues if this develops into wider use, then autonomous use, and the potential for inadequate communication or conflict with drones used in emergency management, environmental and agriculture management, including across borders and within and outside of the EU in Ireland's case. The need for global AI regulation for drones and autonomous flying vehicles and smart cities, and rural environments, to incorporate governance of and by AI grows. Plautz, J., (2021) noted NASA is working in this area with Orlando Smart City. [707] NASA (2021) vision for infrastructure for autonomous vehicles in real time smart city highlights real time data use also noting the Privacy, Noise and Safety constraints.[708] There is potential for AI education awareness raising too.

Quantum research is a fascinating area. EU member states are now committed to building an EU quantum communication infrastructure, working alongside the European Commission and the European Space Agency known as EuroQCI a secure quantum communication infrastructure that will span the whole EU, part of the space-based secure

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[706] Manna.com (2021) Introducing Drone Delivery website at https://www.manna.aero/ and https://www.manna.aero/#WeDeliverToday (accessed 15 January 2022) (Website states 'Live now in Ireland and soon in the rest of the world0.

[707] Plautz, Jason., (2021)., Flying taxis, hyperloops and driverless cars: Is it too early to start planning for future mobility. Available at https://www.smartcitiesdive.com/news/smart-transportation-flying-taxis-hyperloops-long-range-planning/609454/ (accessed 15 January 2021)

[708] NASA (2021) Autonomous Flying Vehicles in Smart Cities Infrastructure being built Video at Available on YouTube https://www.youtube.com/watch?v=0ifhDNcyVUQ (accessed 15 January 2022).

connectivity system planned for high-performing and secure networks for Europe's businesses, governments, and educational institutions (European Commission 2021). Quantum AI ethics represents an area for further research particularly in AI financials ethics also in Cyber AI and quantum, and Quantum AI at the Helm.

### 5.4 Research Exclusion, AI and the Arts another area for further research

Because this research focused on the governance of AI ethics financials data and public policy some AI areas were excluded relating to the Arts. Painting by AI for example, and AI creating music. Kaleagasi B., (2015), highlights a company AIVA technologies, involved in the arts, which created an AI called "Aiva" (Artificial Intelligence Virtual Artist) and taught it how to compose classical music" which he notes is "an emotional art which is usually considered to be a uniquely human quality." Also noting that "Aiva's musical pieces are used as soundtracks for film directors, advertising agencies, and even game studios.", noting that the "technology is based on deep learning algorithms, which use reinforcement learning techniques" He noted

> The technology behind Aiva is based on deep learning algorithms which use reinforcement learning techniques. Deep learning is a particular type of machine learning whereby multiple layers of "neural networks" are programmed to process information between various input and output points. Although only loosely based on the human brain's neural structure, it helps to think of it that way. This allows the AI to understand and model high-level abstractions in data, such as the patterns in a melody or the features in a person's face.

And that:

> Reinforcement learning, on the other hand, is a machine learning technique which teaches a software agent (AI) to decide what action to take next in order to reach certain objectives by maximizing its "cumulative reward." Unlike supervised learning, reinforcement learning does not require labelled inputs and outputs of data. This allows the AI to "find its own way" around the data and improve its performance without being given any explicit instructions, which makes it easier to capture the diversity and variation found in creative arts like music.

Also, that "Aiva recently became the first AI ever to officially acquire the worldwide status of Composer" "registered under the France and Luxembourg authors' right society," "where all of its works reside with a copyright to its own name."[709]

An example of using AI to compose music is below.

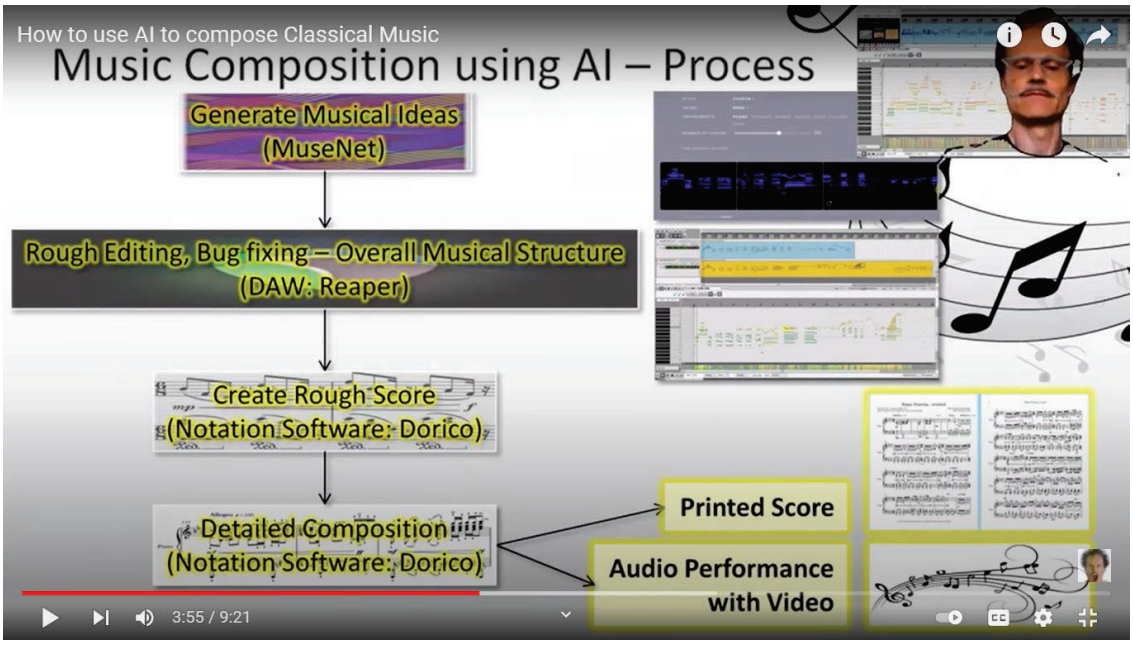


**Figure 5.5 Tomandl, Dirk., (2020), How to use AI to compose Classical Music Available on YouTube at https://www.youtube.com/watch?v=ODasvwQFHKs&t=72s (accessed 31 January 2022)**

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709 Kaleagasi Bartu (2015) *A New AI Can Write Music as Well as a Human Composer The future of art hangs in the balance.* Paragraphs 4, 6, 7, 8 and 9. Published by Kaleagasi, Bartu, on Futurism.com. Available at https://futurism.com/a-new-ai-can-write-music-as-well-as-a-human-composer (accessed 18 January 2022)

Note: Terms and Conditions of Use – Camden Media Will need to write? Check with tutor.

De Mántaras, Ramon-López., and Lluís Arcos, Josep., (2002) surveyed (1) compositional, (2) improvisational, and (3) performance computer music systems based on AI techniques and concluded that "with not much effort, our system could generate expressive performances in other styles provided that we introduce the pertinent cases in the case base" also noting that "truly humanlike performance has to cope, among other things, with at least some basic improvisation resources, such as not playing some notes and adding ornamental notes".[710] Speaking as a tin whistle player, this resonated.

But matters have moved on in AI Music since 2002. AI music has caught popular imagination and is of interest to the music industry. Take for example the Eurovision Song Contest first established in the aftermath of World War 2 one of many initiatives to try to unify European Countries. In 2020, the AI Song Contest was introduced. Portrait XO + Rezar (2021), music is an example of Human and AI collaboration and the website Process Document provides an excellent overview, referencing the training data and combination of 'unique data sets' also that they "allowed the music production to be led by the strange glitches and sonic textures that came out of these models" sets out how ethics and diversity were considered, but when asked "throughout the process, how did your team discuss the ethical issues that arise around data, models, musical output, creative agency and

[710] De Mántaras, Ramon-López., and Lluís Arcos, Josep., (2002), *AI and Music: From Composition to Expressive Performance.* Pages 43 and 55 Published by De Mántaras, Ramon-López., and Lluís Arcos, Josep., in AI Magazine, American Association for Artificial Intelligence, Menelo, California, USA, AI Magazine 23:43-58. Available at https://www.researchgate.net/publication/220605476_AI_and_Music_From_Composition_to_Expressive_Performance (accessed 18 January 2022)

ownership" the response is "We've only had 1 session together to create this song, so we haven't had long enough time to venture too deeply into other topics around AI. [711]

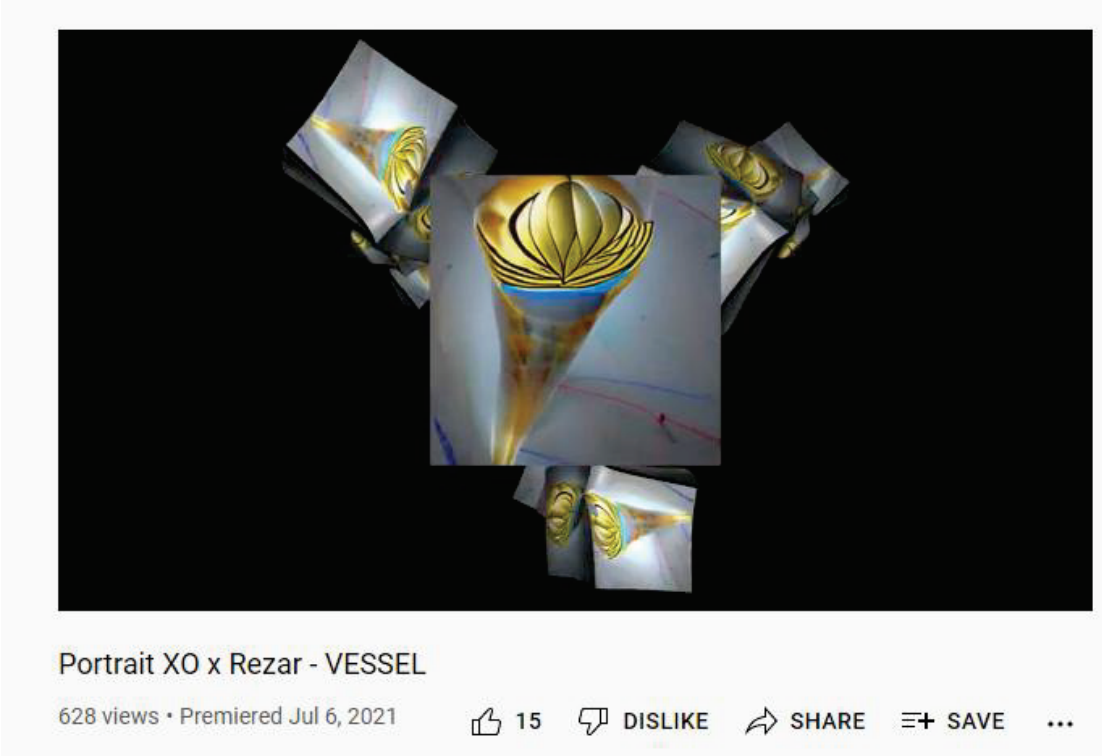


**Figure 5.6 Portrait XO x Rezar – VESSEL (2022) Hide and Seek Race for Gold. Available on YouTube at https://www.youtube.com/watch?v=ys0qUNZCYeI&t=2s (accessed 18 January 2022)**

Ling, T., (2021) states "We're getting to a point now where we have these essentially black boxes that we put music into, and nice new music comes out. But we don't really understand the details of what it's doing."

[711] Portrait XO.space., and Rezar., (2021), AI Song contest webpage available at, https://portraitxo.space/AI-Song-Contest-2021 (accessed 18 January 2021) Youtube Portrait XO x Rezar – VESSEL (2021) Hide and Seek Race for Gold available on YouTube at https://www.youtube.com/watch?v=ys0qUNZCYeI&t=2s (accessed 18 January 2022)

> These neural networks also consume a lot of energy. If you're trying to train AI to analyse the last 20 years of pop music, for instance, you're chucking all that data in there and then using a *lot* of electricity to do the analysis and to generate a new song. At some point, we're going to have to question whether the environmental impact is worth this new music.[712]

AI art could be an area for further research in Public Policy terms from a variety of perspectives, use of music in therapies. But also, in Capital Public Infrastructure funding, in Ireland for example where 1% of the roads funding is provided for Art. An interesting perspective if the art is AI created using copyright (sampling). This is also an area for future research under Climate Change and sustainability.

Another area for future research is the role of AI at the Helm and, governance relating to AI financials and corporate reporting, as in the Sarbanes-Oxley Act ENISA., (2022), website states that "the purpose of SOX is to prevent corporate scandals and rebuild the trust of the general public towards the stock markets that the goals of SOX are: Ensuring independence of auditors and preventing conflict of interest and Increasing transparency by providing additional financial disclosures, and also creating an environment which supports corporate responsibility"[713] ENISA's focus is cyber security, and considers this

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712 Ling, Thomas (2021), AI is about to shake up music forever, but not in the way you think. Paragraphs x and x Published by Ling, Thomas, Science Focus.com Immediate Media Company, BBC, London, UK. Available at https://www.sciencefocus.com/science/ai-music-future/ (accessed 18 January 2022)

713 EU, ENISA., (2022) SOX. Webpage available at https://www.enisa.europa.eu/topics/threat-risk-management/risk-management/current-risk/business-process-integration/governance/frameworks/sox (accessed 03 February 2022.

USA Act and other countries versions of SOX and states under the heading, risk management:

> "Most often referred to sections are 302 and 404.
>
> Section 302 (*Corporate responsibility for financial reports*) describes a set of procedures that guarantee the quality of financial disclosures.
>
> Section 404 (*Management assessment of internal controls*) requires the evaluation of internal controls and risks by management board.
>
> The influences of implementing SOX on IT mainly relates to data integrity and support for audits. Focus areas are:
>
> - Confidentiality of information
> - Ensuring integrity of data and its availability to entitled entities
> - Audits and logging of events
> - Change management. [714]

Can AI be a signing officer? In an Autonomous DAO? Could an AI Board Member prevent a 'Golden Parachute' payment? Or receive a salary, a Golden Parachute payment? Can autonomous AI be considered a Senior Financial Officer[715] in Sox terms? In a world where 'AI Diplomat' exists could Autonomous AI with Emotional Intelligence be a Whistleblower?

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[714] EU, ENISA., (2022) SOX. Webpage available at https://www.enisa.europa.eu/topics/threat-risk-management/risk-management/current-risk/business-process-integration/governance/frameworks/sox (accessed 03 February 2022.

[715] Sarbanes-Oxley Act (2002) Section. 406. 15 U.S.C. 7264 CODE OF ETHICS FOR SENIOR FINANCIAL OFFICERS. https://www.govinfo.gov/content/pkg/COMPS-1883/pdf/COMPS-1883.pdf (accessed 03 February 2022).

## 5.5 Conclusion and Implications

This research sought to establish the relationship of ethical AI in data analytics of financial data, governance, and better public sector policy. There are principles for AI ethics, but the concept of "governance by AI" "AI at the Helm" including AI DAOs, AI Robot software, AI Diplomat, AI-EI, particularly in the context of augmented financials and better public policy research is in its' infancy and isn't considered sufficiently in public sector ethics and governance codes, this impacts on financial and statistical data used in government policymaking.

This research has shown how AI together with Blockchain, RPA, and machine learning would bring transparency to public sector financial data, budgets, forecasts, real-time expenditure analysis, improve AML/CFT, and support development, implementation and assessment of complex policy matters including supporting social good, taxation raising, and has highlighted a new area Governance by AI 'AI at the Helm' where AI is managing financials, procurement, on Boards of Directors, in Diplomacy, in place already, including AI citizen and emerging AI with emotional intelligence. It has also highlighted the benefits of Swarm Robotics including in Smart Cities and in Environmental Management. Citizen voice is important to the scrutiny of financial data in public sector and both AI software and an AI citizen exist today. It has shown that AI is at the forefront of democracy. Yet, the governance frameworks globally are in "catch-up mode" and there is also a need to strengthen the relationship with AI financials, ethics training, a need to focus on "AI for Good", Blockchain use, Cryptocurrency, supporting human rights, social inclusion, equality, economics, all public policy. And this research also asks that we

consider autonomous AI with Emotional Intelligence and its societal role. Again, an area for further research.

### 5.6 The Importance of Ethics and a focus on Democracy

The National Geographic Society, Resource Library., (1996-2022), online encyclopedia stated the "ancient Greeks were the first to create a Democracy"

> "The word "democracy" comes from two Greek words that mean people (*demos*) and rule (*kratos*). Democracy is the idea that the citizens of a country should take an active role in the government of their country and manage it directly or through elected representatives. In addition, it supports the idea that the people can replace their government through peaceful transfers of power rather than violent uprising or revolution. Thus, a key part of democracy is that the people have a voice.[716]

This is true today. UNSECO Constitution, (1945) Extract from the Preamble to the Constitution of UNESCO, London, 16 November 1945

> "The Governments of the States parties to this Constitution on behalf of their peoples declare, "that since wars begin in the minds of men, it is In the minds of men that the defences of peace must be constructed . . . "that a peace based exclusively upon the political and economic arrangements of governments would not be a peace which could secure the unanimous, lasting and sincere support of the peoples of the world, and that the peace must therefore be founded, if it is not to fall, upon the intellectual and moral solidarity of mankind.
> "For these reasons, the States parties ... are agreed and determined to develop and to increase the means of communication between their peoples and to employ these means for the purposes of mutual understanding and a truer and more perfect knowledge of each other's lives."[717]

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[716] National Geographic Society, Resource Library., Encyclopedia Online., (2019), Democracy (Ancient Greece) Paragraphs 1 and 2. Published by the National Geographic Society, Resource Library, Washington DC, USA. available at https://www.nationalgeographic.org/encyclopedia/democracy-ancient-greece/ (accessed 30 January 2022) (Last updated 15 March 2019)

[717] UNESCO (1945) Constitution Published by UNESCO Paris, France. Available at https://unesdoc.unesco.org/ark:/48223/pf0000372956/PDF/372956eng.pdf.multi.page=6 (accessed 19 January 2022) UNESCO Courier.

Plato's Republic is a philosophical enquiry into morality, reflecting on the ideal community but also about Democracy and what it looks like in his time in a dialogue which reflects on the movement from oligarchy through democracy.

> … "Next I suppose we better try to see how democracy starts and what its characteristics are once it exists. page 293
> …
> "So, democracy starts, in my opinion, when the poor members of the community or victorious. They kill some of the rich, they expel others, and they give everyone who's left equal social and political rights: in a democratic system governmental posts are usually decided by lot."
>
> "Yes" he said "that's democracy is founded, it but it might not involve force of arms fear might of been used to drive their enemies away."
>
> "Alright" I said, "but what kind of constitution is it? What's a democratic political system actually like? I mean this is how we learn about the corresponding democratic individual obviously."
>
> "Obviously" he agreed.
> "Well in the first place the members of the community are autonomous aren't they? The community is informed by independence and freedom of speech, and everyone has the right to do as he chooses doesn't he? Page 295
> …
> "It's probably the most gorgeous political system there is." I said page 296[718]

[718] Plato (c427-347 BC) Waterfield, Robin., (1993) Plato Republic Pages 293, 296. Published by Oxford World Classics. New York, USA. Translation and introduction by Waterfield, Robin. ISBN 978-019-9535-76-97

Today there are between 197 and 215 countries/states/territories in the world at January 2022[719], and the Economist Intelligence Unit Democracy Index 2020, reports on 167 countries noting that "only about half of these countries are a democracy" "49.4%"[720]

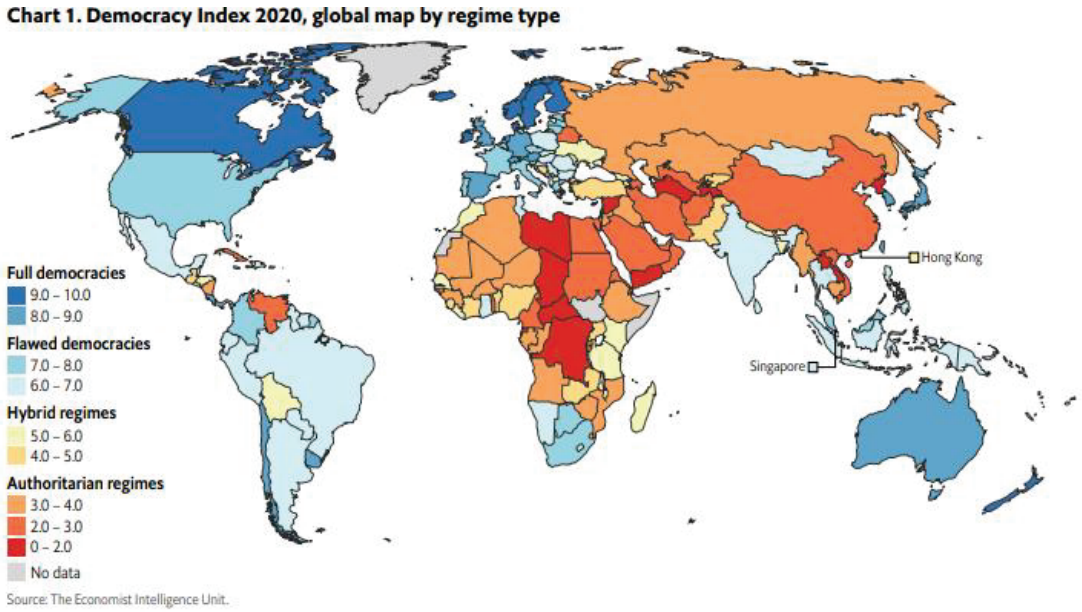


**Table 5.1 Global Democracy Index for 167 countries noted "only about half 49.4% of the world's population live in a democracy of some sort". Published by the Economist Intelligence Unit UK (2021)**

AI and associated technologies aren't mentioned in the context of Democracy assessment although areas impacted by AI are, for example, trust in Government.

719 Onestepforward.com (2022) *How many countries in the world in 2022? 193? 197? 215?* website at https://onestep4ward.com/how-many-countries-in-the-world/ (accessed 28 January 2022) [Blog Ward John]

720 Economist Intelligence Unit (EIU), (2021), *Democracy Index 2020 In Sickness and in Health?* Pages 3 and 4. Published by the Economist Intelligence Unit, UK, available upon request at https://www.eiu.com/n/campaigns/democracy-index-2020/ (accessed 28 January 2022)

Democracy has been part of the global space, for millennia, and many of the underpinning concepts including ethics, referenced by Plato and Aristotle are relevant today

Brown, L., (2019) in his introduction to Aristotle's' Nichomachean Ethics asks "can work in ethics have relevance and even truth in all historical periods?" noting the universality of Aristotle's theory being 'based on an account of human nature" that "two and a half millennia later and in the light of developments in morality and moral theory today's readers may be struck and even appalled by some of his assumptions and values," referencing "slavery" and a "lowly status for women"[721] yet in this world today, slavery still exists even in democratic countries[722] and woman are not of equal status in all countries. In Ireland, for example, a democracy and member of the EU the 2018 global slavery index reports estimated 8,000 living in modern slavery[723].

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721 Aristotle (384bc-322bc) *The Nicomachean Ethics* Pages xxviii, 00 and 00. Published by Oxford University Press, New York, USA, Translated by David Ross, Introduction by Lesly Brown. (2009) ISBN 978-0-19-921361-0

722 EU knowledge4policy link to the Global Slavery Index 2018 Website Published by EU knowledge4policy, Index Walk Free the Global Slavery Index Published by the Minderoo Foundation Pty Ltd, Ninderoo, Australia https://knowledge4policy.ec.europa.eu/dataset/ds00079_en (accessed 28 January 2022)

Note on Website: The Global Slavery Index provides a map; country by country; of the estimated prevalence of modern slavery; together with information about the steps each government has taken to respond to this issue. This information allows an objective comparison and assessment of both the problem and adequacy of the response in 167 countries.

723 Walk Free (2018) Global Slavery Index 2018 – country selected, Ireland. Published by Walk Free, the Minderoo Foundation Pty Ltd, Ninderoo, Australia Available at https://www.globalslaveryindex.org/ (accessed 28 January 2022) Also on the EU website https://knowledge4policy.ec.europa.eu/dataset/ds00079_en

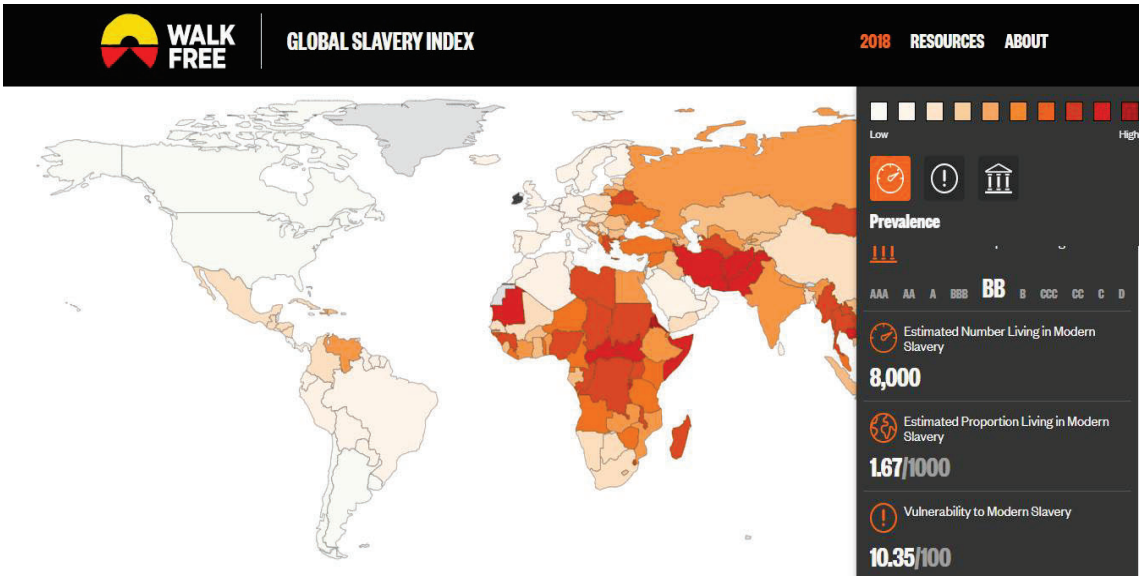


**Table 5.2 Global Slavery Index 2018 – Ireland's 8,000 estimated population living in Modern Slavery. Published by Walk Free.**

Men, woman, and children enslaved, today. Makes you think. About policy, about Democracy, about financials, AML, CFT, remembering the words of the FATF (2021), that 'money laundering is not a victimless crime'.

Goff, P., A., (2021) of the Centre for Policing Equity notes the challenges of Democracy today, including slavery "the need for abolition has never been more alive than it is today" that "Countries have failed to address the existential crises of our time, including economic inequality and climate change, leading to a recession in global democracy" and that "We must examine closely the ways in which our systems are set up to stratify and exclude." And references, "systems", "internet access, public education, and corporate governance" in the context of "abolition democracy the working of rebuilding our systems with equity at their core" and highlights slavery noting that "others might think about efforts to end human trafficking and forced labour that still afflicts some 40 million

people.[724] But for many, the term 'abolition' connotes the struggles of a bygone era" "abolition isn't a relic of our history", it's the key to revitalising democracy." He states:

> Even before the pandemic, the Fourth Industrial Revolution has disrupted the ways we work, learn and live. That disruption is an opportunity to build equity into the base of our evolving systems, from internet access to public education to corporate governance. If we fail, we will have — literally — built them to burn.
>
> So, ahead of this year's forum, ask yourself a different question: Do you believe in democracy? If the answer is yes, the best way to revitalise it may be to embrace the work of abolition democracy, from whichever powerful perch you occupy.
>
> Charity alone, kindness from those who have benefitted most from institutions that marginalise the vulnerable, cannot lead us to justice. Abolition democracy, the working of rebuilding our systems with equity at their core, just might be able to.
>
> After all, in the long view of history, our choices are simple: build systems that empower the least of us or prepare to watch them torn down until we do. [725]

I think it is important to say that to me, slavery knows no bounds, neither ethnicity, religion, your social class. I grew up in a country which abolished "Magdalen Laundries" in 1996, the year before I was married. The Department of Justice (2013) report references its examination into State involvement with these institutions.

> "The Committee had the benefit of full access to all surviving records of the Religious Congregations which operated the Magdalen Laundries, as well as the ability to search for and access all surviving official records. This Report represents an attempt to clarify and establish an objective picture of the operation of the Magdalen Laundries in twentieth-century Ireland and, in particular, of the facts of State involvement with these institutions."

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[724] Anti-Slavery International, UK (2022) webpage available at https://www.antislavery.org/slavery-today/modern-slavery/ (accessed 28 January 2022) [Anti-slavery international registered charity registered in England and Wales]

[725] Goff, Philip, Atiba., (2021) Abolition isn't a relic of our past, it's the key to revitalising democracy. Paragraphs or single lines, 1-6, 8, 9, and part of the Article Title. Published by Goff, Philip, Atiba., the World Economic Forum Webpage available at https://www.weforum.org/agenda/2021/01/abolition-isn-t-a-relic-of-our-past-it-s-the-key-to-revitalising-democracy/ (accessed 28 January 2022)

State involvement was confirmed. Survivor histories were gathered. The report records that "Many girls and women were placed in the Magdalen Laundries by their own families, for reasons that we may never know or fully understand, but which included the socio-moral attitudes of the time as well as familial abuse."

The report states that a "myriad other stories make up the background of the women who spent some period of time in a Magdalen Laundry between 1922 and the closure of the last such institution in the State in 1996." That:

> "…the large majority of women who engaged with the Committee and especially those who had previously been in Industrial Schools spoke of the deep hurt they felt due to their loss of freedom, the fact that they were not informed why they were there, lack of information on when they would be allowed to leave, and denial of contact with the outside world, particularly family and friends."
>
> There is no single or simple story of the Magdalen Laundries." [726]

Or of slavery. 40 million people today. Or of Democracy and Democratic Institutions.

Tietz, T., (2012) references Thomas Hobbes as a philosopher of the Age of Enlightenment, noting that his book 'Leviathan' 'established the foundation for most of Western political philosophy from the perspective of social contact theory" quoting:

> *"I know not how the world will receive it, nor how it may reflect on those that shall seem to favor it. For in a way beset with those that contend, on one side for too great Liberty, and on the other side for too much Authority, 'tis hard to passe*

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[726] Ireland, Department of Justice., (2013), Report of the Inter-Departmental Committee to establish the facts of State involvement with the Magdalen Laundries. Introduction, Paragraphs 1, 4, 7, 9, 29. And Chapter 3: History of the Magdalen Laundries and institutions within the scope of the Report Page 48 paragraph 117. Published by the Department of Justice, Dublin, Ireland, Available at https://www.justice.ie/en/JELR/Pages/MagdalenRpt2013 (Accessed 05 March 2022)

*between the points of both unwounded." Thomas Hobbes, Leviathan, The Epistle Dedicatory, Paris, April 15-25, 1651.*[727]

Also positing that "Hobbes' theories differ in many aspects from the ideas by Aristoteles, who understood a society's goal as an '*eudaimonia*' (good life). Hobbes saw in contrast a common-wealth's goal as '*summum malum*' (the prevention of the worst evil)". [728]

Philosophy.com (2012)., states that **"**Hobbes theories have based our most modern political systems" that "*man is wolf to man*" "rests on the idea that men cannot agree because they are too suspicious. So you need a third to make them respect each other. The Leviathan is this third party, the force which binds the guardianship contractors" concluding that "Leviathan is the peaceful response to the instincts of human destruction. Politics aims to civilize man. We are far from the classic review of Hobbes' Philosophy, which tells us that Hobbes advocates a pure absolutism."**[729]**

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727 Hobbs, Thomas, (1651) Leviathen. Page 57 (Page 3 of Leviathen) Edited with an introduction and notes by J.C.A. Gaskin Published by Hobbs, T., Oxford Worlds Classics 1996, New York, USA, EPDF Hawthorne, Canada, 2022 online at https://epdf.pub/queue/leviathan543a268759ecb5d2ca114d74d8b6844d20437.html (accessed 02 February 2022)

728 Tietz, Tabea., (2012), Man is Man's Wolf – Thomas Hobbes and his Leviathan. Paragraphs 1-2 Published by Tietz, Tabea., on SciHi Blog, Yovisto, Potsdam, Germany, available at http://scihi.org/thomas-hobbes-leviathan/ (accessed 02 February 2022)

729 The Philospohy.Com (2012) Hobbes: Man is a wolf-to-man, Published by The Philosophy.com. Available at **https://www.the-philosophy.com/hobbes-man-is-a-wolf-to-man** (Accessed 02 February 2022) Powered by WordPress The Philosophy.com 2008: [**Cite this article as: Tim, "Hobbes: Man is a wolf to man, May 10, 2012, " in *Philosophy & Philosophers*, May 10, 2012, https://www.the-philosophy.com/hobbes-man-is-a-wolf-to-man**]

Hobbs, T., (1651) describes the role of Councilors/Council of State in 'of Commonwealth' and references the role of people in a Democracy.

> "Neither a councillor (nor a council of state, if we consider it with no authority of judicature or command, but only of giving advice to the sovereign when it is required, or of offering it when it is not required,) is a public person. For the advice is addressed to the sovereign only, whose person cannot in his own presence, be represented to him, by another. But a body of councillors, are never without some other authority, either of judicature, or of immediate administration: as in a monarchy, they represent the monarch, in delivering his commands to the public ministers: in a democracy, the council, or senate propounds the result of their deliberations to the people, as a council; but when they appoint judges, or hear causes, or give audience to ambassadors, it is in the quality of a minister of the people: and in an aristocracy the council of state is the sovereign assembly itself; and gives counsel to none but themselves." [730]

Also describing a commonwealth as an 'artificial man' with 'artificial chains called civil laws':

> "*But as men, for the attaining of peace, and conservation of themselves thereby, have made an artificial man, which we call a commonwealth; so also have they made artificial chains, called civil laws, which they themselves, by mutual covenants, have fastened at one end, to the lips of that man, or assembly, to whom they have given the sovereign power; and at the other end to their own ears. These bonds in their own nature but weak, may nevertheless be made to hold, by the danger, though not by the difficulty of breaking them.* [731]

[730] Hobbs, Thomas, (1651) Leviathen. Page 218 (Page 164 of Leviathen Chapter 24, Of Commonwealth, Point 13). Edited with an introduction and notes by J.C.A. Gaskin Published by Hobbs, T., Oxford Worlds Classics 1996, New York, USA, EPDF Hawthorne, Canada, 2022 online at https://epdf.pub/queue/leviathan543a268759ecb5d2ca114d74d8b6844d20437.html (accessed 02 February 2022)

[731] Hobbs, Thomas, (1651) Leviathen. Page 218 (Page 141 of Leviathen Chapter 21, Of Commonwealth, Point 5). Edited with an introduction and notes by J.C.A. Gaskin Published by Hobbs, T., Oxford Worlds Classics 1996, New York, USA, EPDF Hawthorne, Canada, 2022 online at https://epdf.pub/queue/leviathan543a268759ecb5d2ca114d74d8b6844d20437.html (accessed 02 February 2022)

Today artificially intelligent software and hardware exists. Robot, the word, is noted by Veis, J., (2021) coined by Karel Čapek for his play *Rossum's Universal Robots*, which then was augmented by science of Robotics derived from it by Isaac Asimov" that "technological progress and the myth of robot has been transforming into the reality of robots.[732] And Robot laws today. (Kratts Law, Estonia 2020).

The realities of Robots today are, AI software and hardware**,** Digital co-workers**,** Algorithmic Governance and Algorithmic Government, taking the first steps into AI with EI, Quantum AI, and better public policy, and Democracy. Robots with 'a worldview' (McCarthy, J., 2006). This is a very exciting time to contribute to shaping public policy, a crossroads for AI Ethics, AI financials and governance, and Democracy.

Aristotle Nicomachean Ethics consider the Human Good, Moral Virtue, Justice, Intellectual Virtue, Continence, and Incontinence: Pleasure, Friendship, Pleasure, Happiness. I was struck by two particular references, that moral virtue "is acquired by repetition of the corresponding acts" which is "confirmed by what happens in states, for legislators make the citizens good by forming habits in them, and this is the wish of every legislator and those who do not effect it miss their mark" and under incontinence (lack of self-control) (Brown, L. 2019) concluded Aristotle posited that "the incontinent has the right overall standards and choices, and to that extent at least, knows what he is now doing is bad, even if, in some other way, at the very moment of acting, he does not do so in full

732 Veis, Jaroslav (2021) Robot, the Most Famous Czech, Celebrates 100 Years. Paragraphs 2 and 14. Published by Veis, Jaroslav. Embassy of the Czech Republic in Tallin, Estonia. Available at https://www.mzv.cz/tallinn/en/culture_and_education/robot_the_most_famous_czech_celebrates.html (accessed 02 February 2022)

knowledge"[733] In today's world, acting unethically, or partially unethically (CCAB, 2021), Project management, cost overruns and poor financial data, ((Flyvbjerg, B., 2014), (DPER 2019)). The OECD (2017) stated "inequality, exclusion and disillusionment are the real cost of corruption" and that 10-30% of the investment in a publicly funded construction project may be lost due to mismanagement and corruption, and that "Corruption is one of the most corrosive issues of our time. It wastes public resources, widens economic and social inequalities, breeds discontent and political polarisation and reduces trust in institutions" "corruption perpetuates inequality and poverty, impacting well-being and the distribution of income and undermining opportunities to participate equally in social, economic, and political life.[734] Makes you think AI augmented financials and governance.

### 5.7 Practical Suggestions, Recommendations

Below are practical suggestions for addressing issues raised in the study.

#### 5.7.1 Recommendations AI Augmented Financials, Blockchain, RPA, ML

There is a need for an advocacy role in particular, in relation to AI augmented financials in forecasting, continuous accounting (both widely available today) and

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733 Aristotle (384bc-322bc) *The Nicomachean Ethics* Pages 23 (moral virtue) and xxviii (incontinence). Published by Oxford University Press, New York, USA, Translated by David Ross, Introduction by Lesly Brown. ISBN 978-0-19-921361-0

734 OECD., (2017), Public Integrity. Page 2. Published by the OECD, Paris, France. Website at https://www.oecd.org/corruption-integrity/explore/oecd-standards/integrity-recommendation/Recommendation at https://www.oecd.org/gov/ethics/OECD-Recommendation-Public-Integrity.pdf (accessed 30 January 2022) Recommendation of the Council on Public Integrity 2017.

blockchain RPA use in the public service. These recommendations are supported by both the literature review and the action research findings across all cycles. This advocacy role needs to be at a global level and across all Public Sector. This would bring openness and transparency to public financial management.

Greater use should be made of Blockchain across public sector as done in the USA, Federal Government, managing Exchequer funding, using for example, EBSI within the EU and across all tiers of government in all EU countries. Blockchain should also be used for other financials, Bank Reconciliation, Invoice management, Funds transfer, Payroll.

AI bots should be used for Procurement.

In addition, every public entity globally, should embrace AI augmented continuous accounting, AI augmented forecasting, AI corporate reporting.

DLTs including Cryptocurrency should be incorporated into global governmental financial policy.

The benefit of AI use supporting AML/CFT including determining the risk of radicalization should be part of any Corporate Governance Framework where public sector is involved with money, grants, taxation raising or other financial matter.

The benefit of AI software, (for example 'beingAI') advocacy role for training in AI, ethics, given its availability 24/7, ability to appear as a hologram, reinforcement learning with ethics scenarios and data and stories told by humans and other autonomous AI as part of its engagement should be explored in a global governance framework.

Public Policy and AI Taxation Modelling to support a global Universal Basic Income should be a Policy Objective of global governmental financial policy.

The risks should be managed too. There is need for a global AI Risk Management assessment, considering autonomous AI and reinforcement learning, including risk of use for war/ill/manipulation of thought, as part of a global governance framework.

All Public Sector across the EU at all levels of government (State, Central, Local), should adopt one AI augmented continuous accounting and reporting framework, harmonized across the EU, and adopting an AI approach, combined with the EPSAS regulation, could deliver this vision.

Why not think global standards too? An area for further research and advocacy. There is need one global harmonized AI augmented budgeting, accounting, and reporting standard, for public sector, using internationally recognized standards, GAAP, IFRS, IPSAS.

### 5.7.2 Recommendations: Global Ethics Standard for all Public Sector and Training including awareness raising in relation to AML/CFT and ethics scenarios

But it is not just about technology.

The Global Forum for Rural Advisory Services (2016) teach that:

> Ethical behaviour is not necessarily the same as following the law but there is a relationship between ethics and the law. The relationship between ethics and the law is like the relationship between the bricks and mortar in a wall. The solid bricks represent clearly defined and substantial laws, whereas ethics represent the mortar that fills all the voids between the bricks. It helps to hold the wall together, and give it additional strength. The weaker the mortar, the more likely it becomes that the wall will collapse.[735]

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[735] Global Forum for Rural Advisory Services (2016) *Module 4 Professional Ethics* Page 4. Published by the Global Forum for Rural Advisory Services, Lindau, Switzerland, https://www.g-fras.org/en/knowledge/new-extensionist-learning-kit-nelk.html (Accessed 30 January 2022) [Website dated 2022]

There is need for one global Ethics Standard for public sector staff, the financials aligned with the IFAC global accounting standards, and incorporating Algorithmic Corporate Governance.

The OECD (2017) on Public Integrity Capacity Building, reference, "Providing sufficient information, training, guidance and timely advice for public officials today to apply public integrity standards in the workplace" including

> "on-the-job- integrity training to public officials throughout their careers" 'to raise awareness and develop essential skills for the analysis of ethical dilemmas and to make public integrity standards applicable and meaningful in their own personal contexts"[736]

All public sector employees should be provided with training in AI, public financial management, blockchain, RPA, including swarm robotics, machine learning, and autonomous AI also AML/CFT, DAOs and Cryptocurrency, and how, properly governed, it links with better public policy, training updated a least annually, provided through the lifelong learning.

Annual mandatory AI augmented ethics training for all in the public service (Singapore Power of Game, USA FCPA anti-corruption training, beingAI trainer, imagine the hologram).

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[736] OECD., (2017), Public Integrity 2017. Page 5, Section 8. Published by the OECD, Paris, France https://www.oecd.org/gov/ethics/OECD-Recommendation-Public-Integrity.pdf (accessed 30 January 2022)

### 5.7.3 Recommendations: Algorithmic Corporate Governance

Corporate Governance standards need to be harmonized and to incorporate AI autonomous and non-autonomous in the governance frameworks.

AI in Charge needs new modes of governance which need to be developed. Every public entity using AI and/or governed by AI should have an Algorithm Charter as part of its governance framework.

Greater use should be made of DAOs and AI DAOs in public sector.

### 5.7.4 Recommendations: Diversity and Inclusion, Education Opportunities and Digital Coworkers

UNESCO (2018) continues to highlight the importance of Education as "a fundamental human right and an essential tool for achieving the objectives of equality and sustainable development Noting (2021) the Convention and Recommendation against Discrimination in Education (1960), reflect UNESCO's constitutional mission of instituting collaboration among nations to *'advance the ideal of equality of educational opportunities without regard to race, sex or any distinctions, economic or social.'* [737]. UNESCO consult and report annually. [738] The UNESCO (2021) Global Ethics Agreement

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[737] UNESCO., (2018), Report Ensuring the Right to Equitable and Inclusive Quality Education, Results of the Ninth Consultation of Member States on the implementation of the UNESCO Convention and Recommendation against Discrimination in Education, (2018). Page 3. Published by UNESCO, Paris, France available at https://unesdoc.unesco.org/ark:/48223/pf0000251463 (accessed 03 February 2021)

[738] UNESCO (2021) 10th Consultation on the implementation of the Convention and Recommendation against Discrimination in Education. Webpage Published by UNESCO, available at https://en.unesco.org/themes/right-to-education/convention-against-discrimination/consultation (accessed 03 February 2022) Report Ensuring the Right to

notes the “profound, new role in human practices and society” “creating a new context for children and young people to grow up in, develop an understanding of the world and themselves, critically understand media and information, and learn to make decisions.” AI as an educational tool. An emerging opportunity.

Advocacy of AI use as an Education Tool supporting equality, non-discrimination, and sustainable development a tool for all, Schools, Adult Educations, Lifelong learning today.

The Centre for Legal Leadership UK (2021) noted digital workplace and Diversity and Inclusiveness are important but there is sometimes a disconnect between the two noting that in-house legal teams are well placed to provide a sensible level-headed view and point out where Diversity and Inclusiveness is not being applied, use of imagery, remote working, and acknowledging cultural differences to digital. They noted that although leading with a legal and risk hat on, might make people listen.

In House Legal Teams should review and report annually on Diversity and Inclusiveness, identifying areas of exclusion, in all public sector entities.

### 5.7.5 Recommendation: RPA, Digital Co-Workers

Digital co-workers exist today for example a digital coworker for Mortgage Lending, something this research considered, noting the importance of including Digital Co-Workers as part of Workforce Planning. Public Sector should incorporate Digital

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Equitable and Inclusive Quality Education (2018) available at https://unesdoc.unesco.org/ark:/48223/pf0000251463 Page 3.

Coworkers into the daily government processes, the AI, RPA, governance frameworks, examples include, AI procurement bots, AI mortgage lending bots, Chatbots, AI financials, freeing up public sector staff for even more value-added work.

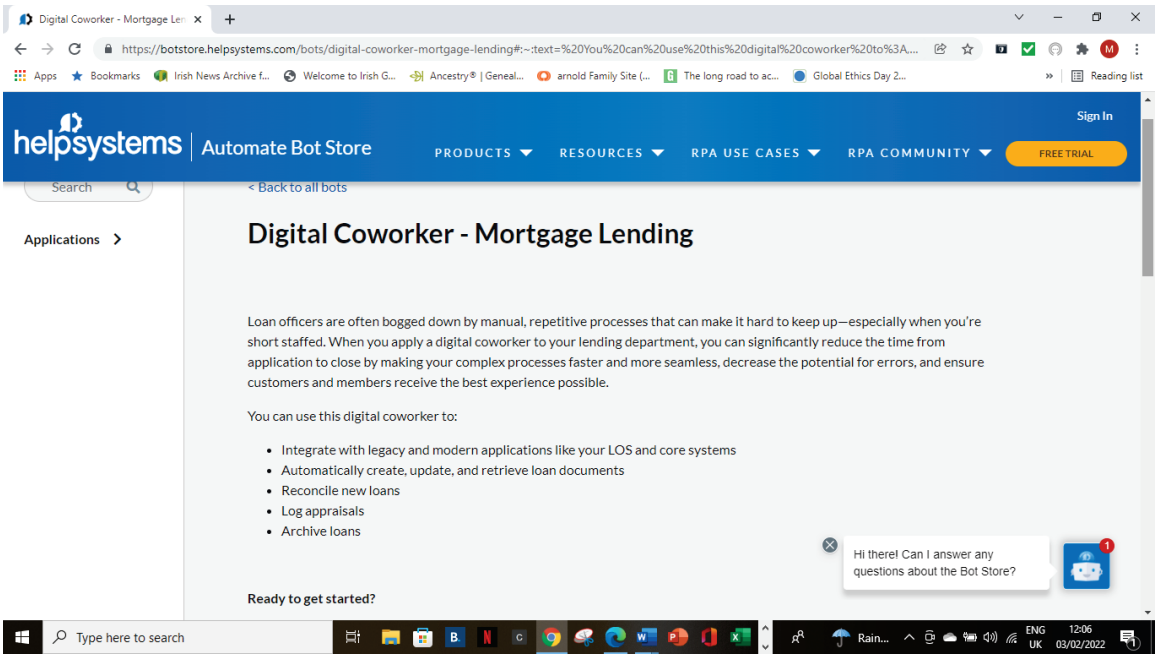


**Figure 5.7 Digital Co-Worker - Mortgage Lending, Request your Digital Co-Worker. Botstore Helpsystems.com https://botstore.helpsystems.com/bots/digital-coworker-mortgage-lending#:~:text=%20You%20can%20use%20this%20digital%20coworker%20to%3A,4%20Log%20appraisals%205%20Archive%20loans%20More%20 (Accessed 03 February 2022)**

The World Bank., (2021), referenced harnessing AI to a new Policy and Regularity Framework. Torres Santelli, J., and Gerdon, S., (2019), state that, "Government faces significant challenges for widespread AI adoption" and posit that "contrary to the popular belief that technology is the main roadblock, technical challenges form just part of the task at hand and this is the most straightforward part to address. Culture and processes, both

ingrained in organizations, also need adjustment before AI can be fully exploited."[739] An education opportunity? To support culture change and new AI augmented processes, procurement, continuous budgeting, continuous accounting, AI reporting, and including Digital Co-Workers. Perhaps through storytelling?

### 5.7.6 Recommendation: Storytelling as a Strategic Policy Influencing Tool

Imagine…

A powerful word. Storytelling, Algorithms at Work: Tales from the Field of Artificial Intelligence (Orlikowski, W., et al., (2019), AI governance in the public sector: Three tales from the frontiers of automated decision-making in democratic settings (Kuziemski, M., and Misuaraca, G., 2020)

> "investigating the legal and policy instruments associated with the use of AI for strengthening the immigration process control system in Canada; "optimising" the employment services" in Poland, and personalising the digital service experience in Finland, the paper advocates for the need of a common framework to evaluate the potential impact of the use of AI in the public sector. In this regard, it discusses the specific effects of automated decision support systems"

Three case studies note, "the growing expectations for governments to play a more prevalent role in the digital society and to ensure that the potential of technology is harnessed, while negative effects are controlled and possibly avoided.[740]

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[739] Torres Santelli, Julián., Deloitte, and Gerdon Sabine., World Economic Forum (2019), 5 challenges for government adoption of AI. Paragraph 13. Published by Torres Santelli, Julián., Deloitte, and Gerdon Sabine., World Economic Forum, Available at. Available at https://www.weforum.org/agenda/2019/08/artificial-intelligence-government-public-sector/ (accessed 05 February 2022)

[740] Kuziemski, M., and Misuaraca, G., I2020), AI governance in the public sector: Three tales from the frontiers of automated decision-making in democratic settings Page 1

Bergman, P., (2011) discusses the revival of the ancient use of storytelling as a teaching tool, how it can be used in teaching values and in promoting learning for nurse practitioner students and for clients of all ages" that "stories are better able to illustrate values and may therefore have a greater impact on learning" and examines "differences between stories and case studies"[741] I thought about learning, describing an imagined world of AI contextualising for the reader, and 8 AI Ethics, Financials, Data and Policy stories were born.

The AI stories developed and uploaded to the Carnegie Council and Conference on the Future of Europe Platforms, a Robot Citizen contributing to public policy consultation and scrutiny of financial statements. AI ethics crowdsourcing, AI DAOs, AI software VITAL with Board Voting rights, AI bots and procurement, Cryptocurrency use for social good, an AI algorithm charter and transparency departed from the case study approach, asked, 'What if?' for scenarios possible or already in place today. The citizen responses brought to light additional considerations influencing the areas for further research and the recommendations and highlighted a surprising disconnect in relation to AI financials, audit scrutiny, also AI DAOs as seen below.

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Published by Kuziemski, M., and Misuaraca, G., Elsevier Ltd. online 2020 Apr 17. doi: 10.1016/j.telpol.2020.101976

[741] Bergman P. Storytelling as a teaching tool. Clin Excell Nurse Pract. 1999 May;3(3):154-7. PMID: 10646409. Abstract. Published by Bergman, P available at https://pubmed.ncbi.nlm.nih.gov/10646409/ (accessed 03 February 2022)

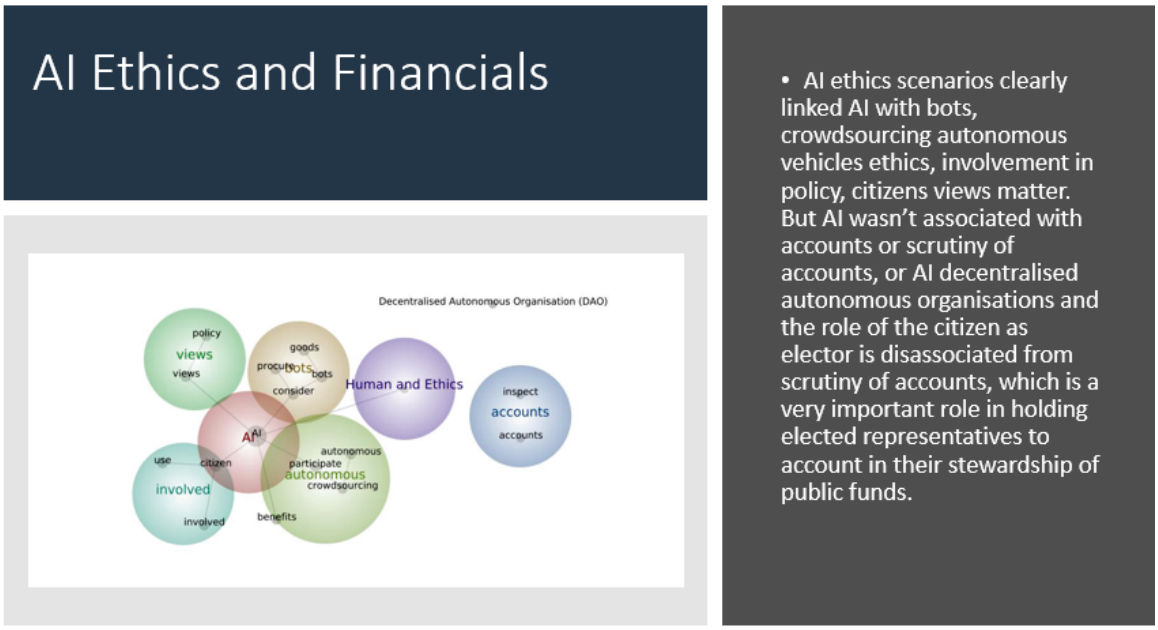


**Figure 5. 8 The surprising disconnect. In a Crypto, AI DAO, Financials world, AI scenarios findings of the Global Ethics Day event 2021, (2021) Leximancer Analysis adapted by Marita Gonsalves and submitted to Carnegie Council October 2021 for upload onto their website as agreed with Carnegie Council**

Kaspersen, A., and Wallach, W., (2022), state "we're failing at the ethics of AI", that "the rollout of AI technology is full steam ahead, and its ethics urgently need to catch up" state "let transparency dictate ethics", that there is need to "listen to a much more inclusive cast of experts and stakeholders" and that there is need to "re-envision ethics for the information age" referencing "a practical and participatory ethic".[742]

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742 Kaspersen, Anja., World Economic Forum, and Wallach, Wendell., Yale University., (2022), We're failing at the ethics of AI. Here's how we make a real impact. Paragraphs 19 and 25, Article Title and Sub-heading, Published by World Economic Forum available at https://www.carnegiecouncil.org/news/media-mentions/2022-01-14-we-re-failing-at-the-ethics-of-ai-here-how-we-make-real-impact (accessed 05 February 2022) Kaspersen, Anja. and Wallach, Wendell are senior fellows at Carnegie Council for Ethics in International Affairs. [Article dated 14 January 2022]

Storytelling runs deep in the human psyche, the story of Kratt, the mythical creature, treasurer bearer in Estonian mythology, used to name the Estonian AL law (Kratts law) bears this out. As does naming Robots, Sophia, VITAL, the beingAI family. The findings of the Action Research storytelling cycles highlighted the importance of being able to present deep and complex matters in a simple way to inform, to educate, also to learn. Reidl, M., and Harrison, B. (2016) argue that 'giving AI the ability to read and understand stories may be the most expedient means of enculturing artificial intelligences so that they can better integrate themselves into human societies and contribute to our overall wellbeing.

Stories influence, ((Berg, Teresa., Bell, Simon., and Morse, Steve., 2019), (Bell, Simon., 1996 updated 2013) (Reidl, M., and Harrison, B. 2016), (Orlikowski, Wanda., J., 1993), (Weick, K. 1993), (Berger, Peter. L., and Luckmann, Thomas., 1966), (De Saint-Exupery, Antoine., 1944, translation 1987)).

AI storytelling as an educational tool should be used for both humans in a lifelong learning contact, and for AI as part of reinforcement learning processes to teach human values.

### 5.7.7 Recommendations: Algorithmic Government Today

An advocacy role for Algorithmic Government, raising awareness, collaborative dialogue informing opinion and policy, developing game theory as an educational tool for AI and financials and updating existing corporate governance frameworks to include AI governance 'of' and 'by' globally, AML/CFT, fraud and corruption prevention and detection and AI Cyber risk management, AI financials budgeting and reporting supports us all in public policy development, implementation, and review.

Autonomous AI (hardware or software) with emotional intelligence citizen rights should be incorporated into a global governance framework including governance of training data and consideration given as to how a robot applying reinforcement learning can 'learn from its' mistakes' in the way humans 'learn from their mistakes' or do not.

Autonomous Robots with EI status should be researched and debated. Asimov, I., (1944) "I've spent the last two days in concentrated introspection" said Cutie "and the results have been most interesting. I began at the one assumption I felt permitted to make. I myself, exist, because I think –. Powell groaned. "Oh Jupiter, a robot Descartes."[743] The New Zealand government awarded 'person status,' to a River. In similar vein, isn't this an important question to ask of an autonomous Robot with EI?

> "Goodbye." said the Fox. "Now, here is my secret. It is very simple. It is only with one's heart that one can see clearly. What is essential is invisible to the eye". Page 82
> …
> "What is important cannot be seen…". Page 99
> …

### 5.7.8 Recommendation: Quantum AI Ethics

Quantum AI is such an exciting space. The (World Economic Forum, and Frontiers Open Access Journals, February 03, 2022), Strategic Intelligence Briefing, states that: "Quantum computing could eventually transform medicine, break formerly reliable encryption, and revolutionize communications and artificial intelligence." But that, "however, despite recent advances, only a handful of quantum algorithms exist- and it

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[743] Asimov, Isaac., (1967) IRobot Pages 104 and 59. Published by Isaac Asimov. HarperCollins, Dublin, Ireland. ISBN 978-0-00-753227-8.

remains an open question whether quantum computers will truly outshine their classical peers. [744] Quantum ethics and AI ethics are not referenced. Quantum AI ethics in AI financials, data, and Algorithmic Government, AI at the Helm, are areas for further research. Schrödingers cat in a sealed box the first time I had learned about quantum mechanics, made me think about the Little Prince and his Sheep in the Box, how the Airman was worried about his human error when drawing, the potential caused for destruction on another planet all hypotheticals. The Airman says at the end of the book, when thinking about his drawing of the Sheep in the Box and its' life in another world.:

> "This is indeed a great mystery. For those of you who, like me, love the little prince, nothing in the universe can be the same while somewhere, nobody knows where, the sheep we have never seen may or may not have eaten a flower…
>
> Look at the sky. Ask yourselves: Has the sheep eaten the flower, yes or no? And you will see how everything changes..." pages 106-107 [745]

Ends.

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[744] World Economic Forum, Frontiers Open Access Journals., (2022) Quantum Dynamic Briefing 03 February 2022, created for Marita Gonsalves Page 3. Published by World Economic Forum, Frontiers Open Access Journals., available at https://intelligence.weforum.org/topics/a1G0X000006OGsDUAW (accessed 03 February 2022) Licensed for personal academic use.

[745] De Saint-Exupery, Antoine., (1944, translation 1987), The Little Prince. Pages 82, 99, 103 and 104. Published by De Saint-Exupery, Antoine., Wordsworth Editions, Ware, UK. ISBN 978 1 84022 813 7. Translated by Testot-Ferry, Irene.

## A Closing thought

Never stop learning. Ná stop an foghlaim riamh.

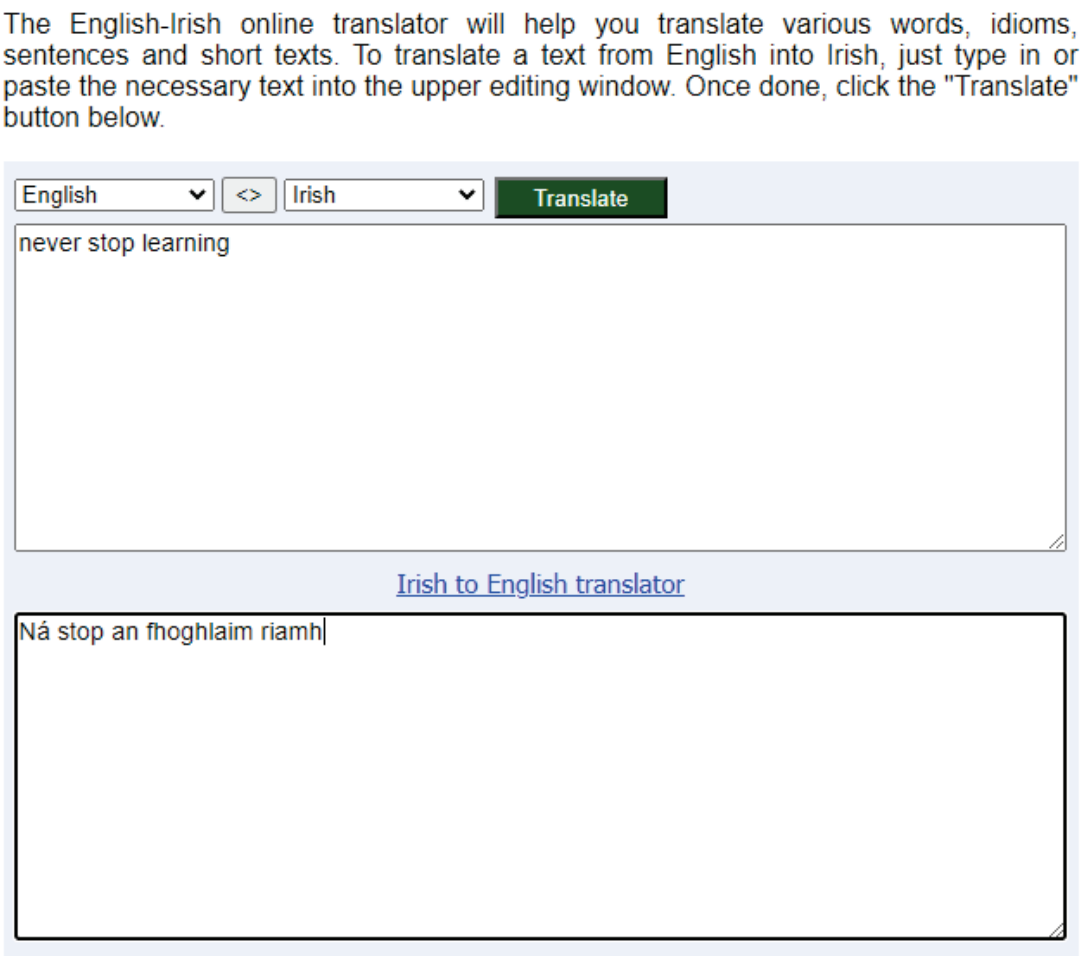


**Figure 1: A Closing Thought** Never Step learning translation by webtran.EU available at https://www.webtran.eu/english_irish_translator/

# APPENDICES

## APPENDIX A: GLOSSARY

| | |
|---|---|
| ACOP | Local Authority Code of Practice and Accounting Regulations (Ireland) |
| AI | Artificial Intelligence |
| AIA | Algorithmic Impact Assessment |
| AI DAO | AI Decentralised Autonomous Organisation |
| AI EI | Artificial Intelligence with Emotional Intelligence |
| AI RFX | AI RFX Procurement Templates for Procuring AI systems<br>The AI-RFX Procurement Framework for AI & Machine Learning Systems (ethical.institute) |
| AICPA | Association of International Certified Professional Certified Accountants |
| AIDA | Artificial Intelligence and Data Analytics |
| AIVA | Artificial Intelligence Visual Artist |
| AML | Anti-Money Laundering |
| AO | Administrative Officer (Civil Service Grade Ireland) |
| API | Application Programming Interface [standardized interfaces] |
| BCE | BCE Before the Common Era |
| BI | Business Intelligence |
| BRUIE | Buoyant Rover for Under-Ice Exploration [NASA] |
| BTS | Build to Share |
| CAI | Chartered Accountants Ireland |
| CASE | Computer-Aided Software Engineering |
| CCAB | Consultative Committee of Accounting Bodies (Ireland and UK) |
| CCAF | Cambridge Centre for Alternative Finance |
| CDD | Corporate Due Diligence |
| CDEI | Centre for Data Ethics and Innovation, UK |
| CEEU | Central Expenditure Evaluation Unit (DPER, Ireland) |
| CEO | Chief Executive Officer |
| CEPEJ | Council of Europe, European Commission for the Efficiency of Justice |
| CFI | Corporate Finance Institute |
| CFO | Chief Finance Officer |
| CFT | Countering of Financing of Terrorism |
| CIPFA | Chartered Institute of Public Finance and Accountancy |
| CJA | Criminal Justice Act (Ireland) |
| CLRG | Company Law Review Group (Ireland) |
| CMA | Certified Management Accountant |
| CPA | Certified Public Accountant |
| CPD | Continuous Professional Development |
| CORDIS | Community Research and Development Information Service (European Union) |
| COVID-19 | Coronavirus Disease 2019 |

| | |
|---|---|
| CPD | Continuing Professional Development |
| CSO | Central Statistics Office (Ireland) |
| DaaS | Desktop as a Service (OGCIO Ireland) |
| DAO | Decentralised Autonomous Organisation |
| DASH | Digital Cash |
| D&I | Diversity and Inclusiveness |
| DDT | Public Debt Dynamics Tool (IMF) |
| DGOU | Digital Government Oversight Unit (Ireland) |
| DHLGH | Department of Housing Local Government and Heritage (Ireland) |
| DL | Deep Learning |
| DLTs | Distributed ledger technologies |
| DPER | Department of Public Expenditure and Reform (Ireland) |
| DPIA | Data Protection Impact Assessment |
| DTTAS | Department of Transport Tourism and Sport |
| e-PSC | A build to share case management system tailored for the Public Spending Code Ireland as part of this doctorate (OCGIO Ireland) |
| e-PQ | e-Parliamentary Questions A build to share tool (OCGIO Ireland) |
| EBA | European Banking Authority |
| EBF | European Banking Federation |
| EBP | European Blockchain Partnership [EU] |
| EBSI | European Blockchain Services Infrastructure |
| EC | European Commission |
| ECA | European Court of Auditors |
| EC DG DIGIT | EC Director General for Informatics [A European Commission Division] |
| ECHR | European Convention of Human Rights |
| EcoDa | European Confederation of Director's Associates (USA) |
| EDD | Enhanced Due Diligence |
| EDPB | European Data Protection Board |
| EI | Emotional Intelligence |
| ENISA | European Union Agency for Cybersecurity |
| EP | European Parliament |
| EPRS | European Parliamentary Research Service |
| EPSAS | European Public Sector Accounting Standards (European Union) |
| EPSTOA | European Parliament Science and Technology Options Assessment |
| ESA | European Space Agency |
| ESA10 | European System of National and Regional Accounts (Eurostat) |
| ETH | Ethereum – digital global money, a cryptocurrency |
| EU | European Union |
| EUACM | Association for Computing Machinery Europe Policy Centre |
| EU EDP | EU Excessive Debt Procedure |

| | |
|---|---|
| Europol | The European Union Law Enforcement Agency |
| Eurostat | European Statistical Office (European Commission) |
| EuroQCI | EU quantum communications infrastructure |
| EURA | EURA European Centre of Excellence on the Regulation of Robotics and AI |
| EY | Ernst and Young |
| FAQ | Frequently Asked Questions |
| FATF | Financial Action Task Force |
| FD | Finance Director |
| FE HE | Further and Higher Education (UK) |
| FRC | Financial Reporting Council (UK) |
| FRS | Financial Reporting Standard |
| FSA | Financial Services Agencies (Tokyo Japan) |
| FTA | Forum on Tax Administration [OECD] |
| G20 | Group of 20 (International Forum) |
| GAO | Government Accountability Office (USA) |
| GAAP | Generally Accepted Accounting Principles |
| GCCC | Government Contracts Committee for Construction (Ireland) |
| GDP | Gross Domestic Product |
| GDPR | General Data Protection Regulation (EU) |
| GFSM | Government Financial Statistical Reporting Manual |
| GFSM 2014 | Government Financial Statistical Reporting Manual 2014 |
| GIS | Geographic Information System |
| GNI | Gross National Income |
| GPS | Global Positioning System |
| GRB | Gender Responsive Budgeting |
| GWP | Global Warming Potential |
| HARP | Heightening Awareness of Research Philosophy |
| HELG | High Level Expert Group on Artificial Intelligence (European Union) |
| IaaS | Infrastructure as a Service (OGCIO Ireland) |
| IAASA | Irish Auditors and Accounting Supervisory Authority |
| IAP2 | International Association of Public Participation (USA) |
| IBC | Interior Business Centre [USA Government] |
| IBM | International Business Machines Corporation |
| ICT | Information and Communication Technology |
| IEEE | Institute of Electrical and Electronics Engineers (USA) |
| IESBA | International Ethics Standards Board for Auditors |
| IFAC | International Federation of Accountants |
| IFRS | International Financial Reporting Standards |
| IGEES | Irish Government Economic and Evaluation Service |

| | |
|---|---|
| IIA | Institute of Internal Auditors |
| IMA | Institute of Management Accountants |
| IMDA | Infocom Media Development Authority (Singapore) |
| IMF | International Monetary Fund |
| INTOSAI | International Organisation of Supreme Audit Institutions |
| IOCTA | Internet Organised Crime Threat Assessment – by Europol (European Union) |
| IOT | Internet of Things |
| IPCC AR4 | Intergovernmental Panel on Climate Change 4th Assessment Report |
| IPSAS | International Public Sector Accounting Standards |
| IPSASB | International Public Sector Accounting Standards Board |
| ISO | International Organisation for Standardisation |
| ISO/IEC | International Organisation for Standardisation/ International Electrotechnical Commission |
| ISSAI | International Standards of Supreme Audit Institutions |
| IT | Information Technology |
| JURI | European Parliament Committee for Legal Affairs (European Union) |
| KPMG AZSA | Klynveld Peat Marwick and Goerdeler, AZSA (Japan) KPMG AZSA LLC - KPMG Japan (home.kpmg) and Firm Profile - KPMG Japan (home.kpmg) |
| LA | Local Authorities |
| LC | Letter of Credit [USA Government Treasury Department] [Blockchain Powered LC] |
| LGAS | Local Government Audit Service (Ireland) |
| LGBT | Lesbian, gay, bisexual and transgender |
| LGMA | Local Government Management Agency (Ireland) |
| MDPI | Multidisciplinary Digital Publishing Institute, Switzerland |
| MFA | Ministry of Foreign Affairs (Germany) |
| ML | Machine Learning |
| ML/TF | Money laundering and terrorist financing |
| NAO | National Audit Office |
| NASA | National Aeronautics and Space Administration [USA] |
| NGO | Non-Governmental Organisation |
| NDP | National Development Plan (Ireland) |
| NIO | National Investment Office (Ireland) |
| NLP | Natural Language Processing |
| NPAs | Non-performing Assets |
| NIST | National Institute of Standards and Technology [USA] |
| NOAC | National Oversight Audit Committee (Ireland) |
| NRA | National risk assessment (Ireland) |
| NSF | National Science Foundation [USA Government Treasury Department] |

| | |
|---|---|
| NSSO | National Shared Service Office |
| OC&AG | Office of the Comptroller and Auditor General [Ireland] OC+AG |
| OCR | Optical Character Recognition |
| OECD | Organisation for Economic Co-operation and Development |
| OECDBP | OECD Budget Principles |
| OGCIO | Office of the Government Chief Information Officer (Ireland) |
| OPSI | Observatory of Public Sector Innovation [OECD] |
| PAC | Public Accounts Committee (Ireland) |
| PANELFIT | Participatory Approaches to a New Ethical and Legal Framework for ICT |
| PDF | Portable Data Format |
| PDPC | Personal Data Protection Commission (Singapore) |
| PEFA | Public Expenditure Financial Accountability |
| PEP | Politically Exposed Person(s) |
| PFM | Public Financial Management |
| PFP | Public Financial Procedures |
| PIMA | Public Investment Management System (IMF) |
| PIN | Prior Information Notice |
| PPP | Public Private Partnership (s) |
| PR | Public Relations |
| PSB(s) | Public Service Body/Bodies |
| PSC | Public Spending Code |
| PSI | Public Service Information |
| Q+A | Question and Answer |
| RaC | Rules as Code |
| RFI | Request for Information |
| RFT | Request for Tender |
| RIA | Regulatory Impact Assessment |
| RIHL | Rebuilding Ireland Home Loan (Ireland) |
| RP | Rich Picture |
| RPA | Robotic Process Automation |
| RTÉ | Raidió Teilifís Éireann (National Broadcaster of Ireland) |
| SAI | Supreme Audit Institution(s) |
| SAR | Strategic Assessment Report (Ireland) |
| SDG | Sustainable Development Goals |
| SHERPA | Shaping the ethical dimensions of smart information systems |
| SI | Swarm Intelligence |
| SIENNA | Stakeholder-Informed Ethics for New technologies with high socio-ecoNomic and human rights impAct |

| | |
|---|---|
| SIPO | Standards in Public Office |
| SME | Small and Medium Enterprise |
| SMEs | Small and Medium Enterprises |
| SMG | Seoul Metropolitan Government (South Korea) |
| SORP | Statement of Recommended Practice |
| SOX | Sarbanes-Oxley Act |
| SSBR | Swiss School of Business Research |
| SVG | Scalable Vector Graphs |
| TASC | Think-tank for Action on Social Change (Ireland) |
| TCO2e | Equivalent Tonnes of Carbon Dioxide (Ireland PSC) |
| TII | Transport Infrastructure Ireland (Ireland) |
| ToR | Terms of Reference |
| TV | Television |
| UBI | Universal Basic Income |
| UN | United Nations |
| UNCRI | United Nations Inter-Regional Crime and Justice Research Institute |
| UNDESA | UN Department of Economic and Social Affairs |
| UNFCCC | United Nations Framework Convention on Climate Change |
| UNICEF | United National International Children's Emergency Fund |
| UNIDIR | UN Institute for Disarmament Research |
| UNMETEP | UN Measurement and Evaluation Tool for Citizen Engagement and E-Participation |
| UNODC | UN Office on Drugs and Crime |
| UNU CPR | United National University Centre for Policy Research |
| UK | United Kingdom |
| USA | United States of America |
| USACM | United States Association for Computational Mechanics |
| VAT | Value-added Tax |
| VFM | Value for Money |
| VITAL | Validating Investment Tool for Advancing Life Sciences |
| WEF | World Economic Forum |
| Wi-Fi | Wireless Fidelity – generic term that refers for a wireless local area network that observes the Institute of Electrical and Electronics Engineers (IEEE) IEEE80211 Protocol [NIST] [USA] |
| WMO | World Meteorological Organisation |

## APPENDIX B: DEFINITION OF TERMS

Below are unusual terms only, as per Swiss School of Business Research guidance.

| Term: | Explanation and source |
|---|---|
| Appresenting | In Husserl: The event of a presentation appropriate as motivating the experiential positing of something different as present along with the strictly presented object.<br><br>https://www.all-dictionary.com/what-does-mean-Appresentation<br>DC Dated February 14th 2022. |
| Autopoiesis | The property of a living system (such as a bacterial cell or a multicellular organism) that allows it to maintain and renew itself by regulating its composition and conserving its boundaries The notion of *autopoiesis* is at the core of a shift in perspective about biological phenomena: it expresses that the mechanisms of self-production are the key to understand both the diversity and the uniqueness of the living.— Francisco J. Varela, in Self-Organizing Systems: An Interdisciplinary Approach, 1981All living beings, from bacterial speck to congressional committee member, evolved from the ancient common ancestor which evolved *autopoiesis* and thus became the first living cell.— Lynn Margulis and Dorion Sagan, What is Life?, 2000<br><br>https://www.merriam-webster.com/dictionary/autopoiesis |
| Intentionality | In philosophy, intentionality is the power of minds and mental states to be about, to represent, or to stand for, things, properties and states of affairs. To say of an individual's mental states that they have intentionality is to say that they are mental representations or that they have contents. Furthermore, to the extent that a speaker utters words from some natural language or draws pictures or symbols from a formal language for the purpose of conveying to others the contents of her mental states, these artifacts used by a speaker too have contents or intentionality. 'Intentionality' is a philosopher's word: ever since it was introduced into philosophy by Franz Brentano in the last quarter of the nineteenth century, it has been used to refer to the puzzles of representation, all of which lie at the interface between the philosophy of mind and the philosophy of language. A picture of a dog, a proper name (e.g., 'Fido'), the common noun 'dog' or the concept expressed by the word can mean, represent, or stand for, one or several hairy barking creatures. A complete thought, a full sentence or a picture can stand for |

| | |
|---|---|
| | or describe a state of affairs. How could some of the represented things (e.g., dinosaurs) be arbitrarily remote in space and time from the representation (e.g., a human thought or utterance about dinosaurs tokened in 2018), while others (e.g., numbers) may not even be in space and time at all? How could some representations (e.g., direct quotations such as 'dinosaur') even stand for themselves? How does a complex representation (e.g., a complete thought or a full sentence) inherit its meaning or content from the meanings or contents of its constituents? How should one construe the relationship between the iconic content of pictorial representations and the conceptual content of proposition-like representations (thoughts and utterances)? How should one understand the relation between the content of an individual's mental state and the meanings of external symbols used by the individual to express her internal mental states? Are representations of the world part of the world they represent? Do all of an individual's mental states have intentionality or only some of them? The entry falls into ten sections:<br><br>• 1. Why is intentionality so-called?<br>• 2. Intentional inexistence<br>• 3. The relational nature of singular thoughts<br>• 4. How can distinct beliefs be about one and the same object?<br>• 5. True negative existential beliefs<br>• 6. Direct reference<br>• 7. Are there intentional objects?<br>• 8. Is intensionality a criterion of intentionality?<br>• 9. Can intentionality be naturalized?<br><br>https://plato.stanford.edu/entries/intentionality/ |
| Non-Maleficence | The ethical principle of doing no harm, expressed in the ancient medical maxim *primum non nocere* (first do no harm). Its approximate counterpart in population health is the precautionary principle.<br><br>https://www.oxfordreference.com/view/10.1093/oi/authority.20110803100237642 |
| Non-Monotonic logic | The term "non-monotonic logic" (in short, NML) covers a family of formal frameworks devised to capture and represent *defeasible inference*. Reasoners draw conclusions defeasibly when they reserve the right to retract them in the light of further information. Examples are numerous, reaching from inductive generalizations to reasoning to the best explanation to inferences on the basis of expert opinion, etc. We find |

| | |
|---|---|
| | defeasible inferences in everyday reasoning, in expert reasoning (e.g. medical diagnosis), and in scientific reasoning.<br><br>https://plato.stanford.edu/entries/logic-nonmonotonic/ |
| Panopticon | a prison with cells (= rooms) arranged in a circle, so that the people in them can be seen at all times from the centre<br><br>https://dictionary.cambridge.org/dictionary/english/panopticon<br><br>Examples As a result, they, like the "subjects" of the panopticon, assumed responsibility for self-discipline due to the highly visible, although very often unverifiable, political monitoring.<br>*From the Cambridge English Corpus*<br>The prisoner inside the panopticon is free in just this way, able to choose between becoming a responsible worker and citizen or not.<br>*From the Cambridge English Corpus*<br><br>Another definition:<br>a building, as a prison, hospital, library, or the like, so arranged that all parts of the interior are visible from a single point.<br>https://www.dictionary.com/browse/panopticon |
| | Ends:- |

## APPENDIX C: GRANTS MANAGEMENT CIRCULAR 13 OF 2014, IRELAND EXCHEQUER FUNDS CHECKLISTS, ANNUAL RETURNS

*Circular 13 of 2014 Management of and Accountability for Grants from Exchequer Funds Guidance Note and Reporting Requirements* states that Grantors should ensure that the principles and procedures reflected in these requirements are applied in a meaningful and effective way in respect of any grants under their remit also that Grantors are required to take a proactive approach to ensuring that the terms and conditions for grants are appropriate to the local conditions in the sector in which they operate, while ensuring effective management and accountability of public money.746

746 Ireland, DPER., (2014). *Circular 13 of 2014 Management of and Accountability for Grants from Exchequer Funds Guidance Note and Reporting Requirements.* Pages 1-6. DPER, Dublin, Ireland, Retrieved from: https://govacc.per.gov.ie/wp-content/uploads/DPER-Circular-13-14-Guidance-Note-and-Reporting-Requirements-1.pdf (Accessed 06 June 2021)

*Circular 13 of 2014 Management of and Accountability for Grants from Exchequer Funds checklists* are below.

The checklists are completed in relation to disbursement of exchequer grant funding and apply to all bodies, including agencies, companies, committees, advisory groups, charities, or individuals, whether directly from the Votes of Government Departments/Offices or through an intermediary body or series of bodies. 747

**Appendix 1a: Illustrative checklist for Grantors. This checklist is not exhaustive. Managers of grants should consider operating a comprehensive checklist relevant for the grant funding they manage.**

| Grantor Checklist ✓ | | | |
|---|---|---|---|
| ***Circular 13/2014*** | **Y / N N/A** | ***Action Required?*** | **Ref.** |
| **Administrative responsibilities**<br>Will the grant be pre-funded or based on vouched expenditure and has sanction been issued for pre-funded schemes? | | | 6, 11(f)-(i), 19, 24 |
| Has the grantor documented cases where there are several levels of intermediary funding? | | | 8 |
| Is the ambit of the Vote correct? | | | 12 |
| Is the grant cash-limited? | | | 12 |
| Are proper procedures in place for the management of the account to pay multiple grantees? | | | 15 |
| If Auditor is not CA&G, is there a note appended to the Vote? | | | 16 |
| **Supervision**<br>Is there clear agreement with the grantee re the grant's objective? | | | 11(a) |
| Is grantee aware of terms under which money is issued? | | | 11(b) - 11(n) |
| Is there a service delivery/level agreement in place with grantee where appropriate? | | | 11(c) |
| Is there an appropriate reporting regime in place? | | | 11(d), 11(k) |
| Is grantee aware that their records can be inspected by the grantor? | | | 11(e) |
| Are all appropriate matured liabilities paid? | | | 17 |

747 Ireland, DPER., (2014). *Circular 13 of 2014 Management of and Accountability for Grants from Exchequer Funds.* Pages, 1, 14, 15. DPER, Dublin, Ireland. Retrieved from: https://circulars.gov.ie/pdf/circular/per/2014/13.pdf (Accessed 06 June 2021)

**Appendix 1b: Illustrative checklist for Grantees - This checklist is not exhaustive. Recipients of grants should consider operating a comprehensive checklist relevant for the grant funding for which they are accountable.**

| Grantee Checklist ✓ | | | |
|---|---|---|---|
| *Circular13/2014* | **Y / N N/A** | ***Action Required?*** | **Ref** |
| **Annual Estimates**<br>Have annual operating budgets for State Agencies been submitted? | | | 18 |
| **Annual Reports**<br>Have end of year accounts or financial statements as appropriate been submitted to each grantor? | | | 21 |
| Has the grantee, if involved in a multiple co-funding arrangement, informed all grantors if exchequer funding exceeds 50% of income? | | | 22 |
| **Compliance** | | | |
| Is all funding being used for the purpose intended? | | | 21(g) |
| Is a current Tax Clearance certificate in place where appropriate? | | | 21(h) |
| For State Agencies, is confirmation of adherence to any service level agreement included with reports? | | | 23 |
| Is there compliance requirements in relation to vouched expenditure? | | | 24 |
| Is there an adequate financial control system in place? | | | 25 |
| Is there confirmation that other sector-specific guidelines / legislation have been adhered to? | | | 26 |

Could this assurance be provided much more easily using AI, RPA and Blockchain? EU OPSI blockchain for EU grants?

Ends:-

## APPENDIX D: ACTION RESEARCH LEXIMANCER ANALYSIS 36 DOCUMENTS

EU 2021

EU, HELG., (2019), *HELG Ethical AI Principles*, Published by the EU, European Commission, Brussels, Belgium at https://op.europa.eu/en/publication-detail/-/publication/d3988569-0434-11ea-8c1f-01aa75ed71a1 (accessed 03 October 2021)

EU, European Parliament, (2000), *Charter of Fundamental Rights of the EU* Published by the EU, European Parliament, Brussels, Belgium https://www.europarl.europa.eu/charter/pdf/text_en.pdf (accessed 03 October 2021)

EU, European Commission., (2009). The EU Values V2.39. Webpage. Published by the EU, European Commission, Brussels, Belgium at https://ec.europa.eu/component-library/eu/about/eu-values/ (accessed 03 October 2021)

EU (2013) Communications Handbook https://europa.eu/european-union/sites/default/files/docs/body/2013-12-10_communication_handbook_en.pdf (accessed 30 October 2021)

EU, Ethics4EU, (2020) European Values for Ethics in Digital Technology, www.informatics-europe.org/component/phocadownload/category/10-reports.html?download=

G20 AI Principles adopted 2019 https://trade.ec.europa.eu/doclib/docs/2019/june/tradoc_157920.pdf

G20 August 2021 Objectives https://www.g20.org/about-the-g20.html or https://www.g20foundation.org/g20/what-is-the-g20

G20 OECD Principles of Corporate Governance adhered to by the IMF https://www.oecd.org/newsroom/new-g20oecd-principles-of-corporate-governance-will-promote-trust-and-improve-functioning-of-financial-markets.htm and https://www.oecd.org/corporate/principles-corporate-governance/ (accessed 30 October 2021)

IFAC IESBA (2019) Technology Initiative Phase 1 Final Report https://www.ifac.org/system/files/publications/files/IESBA-Technology-Initiative-Phase-1-Final-Report_0.pdf (accessed 08 October 2021)

IFAC, International Ethics Standards Board for Accountants (IESBA), (2020), Handbook of the International Code of Ethics for Professional Accountants including International Independence Standards 2020 Edition https://www.ifac.org/system/files/publications/files/IESBA-English-2020-IESBA-Handbook_Web-LOCKED.pdf

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**LEXIMANCER ANALYSIS 36 DOCUMENTS LISTED WORD ASSOCIATIONS COLUMN A SHOWS THE CONCEPTS COLUMN E ADDED THE WORD TRANSPARENCY AS A CONCEPT MANUALLY**

| Column A | | | | Column E | | | |
|---|---|---|---|---|---|---|---|
| **Concept** | **Kind** | **Count** | **Relevance percentage** | **Concept** | **Kind** | **Count** | **Relevance percentage** |
| AI | NAME ACRONYM | 922 | 23 | AI | NAME ACRONYM | 922 | 23 |
| OECD | NAME ACRONYM | 901 | 22 | OECD | NAME ACRONYM | 901 | 22 |
| United Nations | NAME GENERAL | 220 | 5 | United Nations | NAME GENERAL | 220 | 5 |
| public | WORD | 4028 | 100 | public | WORD | 4028 | 100 |
| service | WORD | 2070 | 51 | service | WORD | 2070 | 51 |
| interest | WORD | 1234 | 31 | interest | WORD | 1234 | 31 |
| information | WORD | 1136 | 28 | information | WORD | 1136 | 28 |
| ethical | WORD | 1106 | 27 | ethical | WORD | 1106 | 27 |
| professional | WORD | 1056 | 26 | professional | WORD | 1056 | 26 |
| conduct | WORD | 1051 | 26 | conduct | WORD | 1051 | 26 |
| audit | WORD | 1043 | 26 | audit | WORD | 1043 | 26 |
| standards | WORD | 1020 | 25 | standards | WORD | 1020 | 25 |
| servants | WORD | 988 | 25 | servants | WORD | 988 | 25 |
| management | WORD | 943 | 23 | management | WORD | 943 | 23 |
| client | WORD | 934 | 23 | client | WORD | 934 | 23 |
| ethics | WORD | 888 | 22 | ethics | WORD | 888 | 22 |
| financial | WORD | 881 | 22 | financial | WORD | 881 | 22 |
| officials | WORD | 821 | 20 | officials | WORD | 821 | 20 |
| values | WORD | 784 | 19 | values | WORD | 784 | 19 |
| procedures | WORD | 759 | 19 | procedures | WORD | 759 | 19 |
| include | WORD | 751 | 19 | include | WORD | 751 | 19 |
| including | WORD | 707 | 18 | including | WORD | 707 | 18 |
| government | WORD | 698 | 17 | government | WORD | 698 | 17 |
| countries | WORD | 691 | 17 | countries | WORD | 691 | 17 |
| measures | WORD | 691 | 17 | measures | WORD | 691 | 17 |
| example | WORD | 671 | 17 | example | WORD | 671 | 17 |
| relevant | WORD | 669 | 17 | relevant | WORD | 669 | 17 |
| individual | WORD | 666 | 17 | individual | WORD | 666 | 17 |
| staff | WORD | 656 | 16 | staff | WORD | 656 | 16 |
| team | WORD | 646 | 16 | team | WORD | 646 | 16 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| member | WORD | 646 | 16 | member | WORD | 646 | 16 |
| work | WORD | 633 | 16 | work | WORD | 633 | 16 |
| address | WORD | 622 | 15 | address | WORD | 622 | 15 |
| misconduct | WORD | 619 | 15 | misconduct | WORD | 619 | 15 |
| data | WORD | 617 | 15 | data | WORD | 617 | 15 |
| use | WORD | 616 | 15 | use | WORD | 616 | 15 |
| framework | WORD | 609 | 15 | framework | WORD | 609 | 15 |
| principles | WORD | 606 | 15 | principles | WORD | 606 | 15 |
| report | WORD | 598 | 15 | report | WORD | 598 | 15 |
| specific | WORD | 593 | 15 | specific | WORD | 593 | 15 |
| corruption | WORD | 567 | 14 | corruption | WORD | 567 | 14 |
| official | WORD | 558 | 14 | official | WORD | 558 | 14 |
| members | WORD | 550 | 14 | members | WORD | 550 | 14 |
| issues | WORD | 548 | 14 | issues | WORD | 548 | 14 |
| law | WORD | 548 | 14 | law | WORD | 548 | 14 |
| activities | WORD | 545 | 14 | activities | WORD | 545 | 14 |
| systems | WORD | 542 | 13 | systems | WORD | 542 | 13 |
| following | WORD | 538 | 13 | following | WORD | 538 | 13 |
| civil | WORD | 531 | 13 | civil | WORD | 531 | 13 |
| policy | WORD | 527 | 13 | policy | WORD | 527 | 13 |
| legal | WORD | 509 | 13 | legal | WORD | 509 | 13 |
| required | WORD | 509 | 13 | required | WORD | 509 | 13 |
| system | WORD | 490 | 12 | system | WORD | 490 | 12 |
| used | WORD | 489 | 12 | used | WORD | 489 | 12 |
| general | WORD | 486 | 12 | general | WORD | 486 | 12 |
| services | WORD | 482 | 12 | services | WORD | 482 | 12 |
| level | WORD | 472 | 12 | level | WORD | 472 | 12 |
| ensure | WORD | 466 | 12 | ensure | WORD | 466 | 12 |
| governance | WORD | 457 | 11 | governance | WORD | 457 | 11 |
| control | WORD | 456 | 11 | control | WORD | 456 | 11 |
| provide | WORD | 436 | 11 | provide | WORD | 436 | 11 |
| training | WORD | 410 | 10 | training | WORD | 410 | 10 |
| human | WORD | 409 | 10 | human | WORD | 409 | 10 |
| decisions | WORD | 408 | 10 | decisions | WORD | 408 | 10 |
| potential | WORD | 401 | 10 | potential | WORD | 401 | 10 |
| sector | WORD | 396 | 10 | sector | WORD | 396 | 10 |
| administrati on | WORD | 396 | 10 | administratio n | WORD | 396 | 10 |
| rules | WORD | 385 | 10 | rules | WORD | 385 | 10 |
| case | WORD | 379 | 9 | case | WORD | 379 | 9 |
| process | WORD | 379 | 9 | process | WORD | 379 | 9 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| developme nt | WORD | 378 | 9 | development | WORD | 378 | 9 |
| resources | WORD | 377 | 9 | resources | WORD | 377 | 9 |
| related | WORD | 376 | 9 | related | WORD | 376 | 9 |
| internationa l | WORD | 373 | 9 | international | WORD | 373 | 9 |
| action | WORD | 370 | 9 | action | WORD | 370 | 9 |
| integrity | WORD | 361 | 9 | integrity | WORD | 361 | 9 |
| responsibili ty | WORD | 361 | 9 | responsibility | WORD | 361 | 9 |
| actions | WORD | 361 | 9 | actions | WORD | 361 | 9 |
| private | WORD | 358 | 9 | private | WORD | 358 | 9 |
| rights | WORD | 358 | 9 | rights | WORD | 358 | 9 |
| review | WORD | 357 | 9 | review | WORD | 357 | 9 |
| assets | WORD | 354 | 9 | assets | WORD | 354 | 9 |
| personal | WORD | 351 | 9 | personal | WORD | 351 | 9 |
| take | WORD | 351 | 9 | take | WORD | 351 | 9 |
| risks | WORD | 347 | 9 | risks | WORD | 347 | 9 |
| agency | WORD | 346 | 9 | agency | WORD | 346 | 9 |
| administrati ve | WORD | 343 | 9 | administrativ e | WORD | 343 | 9 |
| employees | WORD | 339 | 8 | employees | WORD | 339 | 8 |
| support | WORD | 338 | 8 | support | WORD | 338 | 8 |
| available | WORD | 336 | 8 | available | WORD | 336 | 8 |
| reports | WORD | 329 | 8 | reports | WORD | 329 | 8 |
| employmen t | WORD | 323 | 8 | employment | WORD | 323 | 8 |
| cases | WORD | 323 | 8 | cases | WORD | 323 | 8 |
| key | WORD | 321 | 8 | key | WORD | 321 | 8 |
| risk | WORD | 314 | 8 | risk | WORD | 314 | 8 |
| office | WORD | 313 | 8 | office | WORD | 313 | 8 |
| particular | WORD | 311 | 8 | particular | WORD | 311 | 8 |
| business | WORD | 309 | 8 | business | WORD | 309 | 8 |
| duties | WORD | 307 | 8 | duties | WORD | 307 | 8 |
| agencies | WORD | 302 | 7 | agencies | WORD | 302 | 7 |
| certain | WORD | 300 | 7 | certain | WORD | 300 | 7 |
| provided | WORD | 298 | 7 | provided | WORD | 298 | 7 |
| bodies | WORD | 296 | 7 | bodies | WORD | 296 | 7 |
| different | WORD | 291 | 7 | different | WORD | 291 | 7 |
| social | WORD | 289 | 7 | social | WORD | 289 | 7 |
| guidelines | WORD | 287 | 7 | guidelines | WORD | 287 | 7 |
| central | WORD | 283 | 7 | central | WORD | 283 | 7 |
| regulation | WORD | 275 | 7 | regulation | WORD | 275 | 7 |
| political | WORD | 266 | 7 | political | WORD | 266 | 7 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| technology | WORD | 258 | 6 | technology | WORD | 258 | 6 |
| based | WORD | 232 | 6 | based | WORD | 232 | 6 |
| possible | WORD | 231 | 6 | possible | WORD | 231 | 6 |
| procuremen t | WORD | 227 | 6 | procurement | WORD | 227 | 6 |
| account | WORD | 211 | 5 | transparency | WORD USER | 216 | 5 |
| media | WORD | 203 | 5 | account | WORD | 211 | 5 |
| form | WORD | 202 | 5 | media | WORD | 203 | 5 |
| approach | WORD | 202 | 5 | form | WORD | 202 | 5 |
| economic | WORD | 199 | 5 | approach | WORD | 202 | 5 |
| value | WORD | 190 | 5 | economic | WORD | 199 | 5 |
| security | WORD | 180 | 4 | value | WORD | 190 | 5 |
| people | WORD | 161 | 4 | security | WORD | 180 | 4 |
| | | | | people | WORD | 161 | 4 |

*Source: Leximancer the 36 documents excluding and including the manually added word, Transparency.*

## APPENDIX E: CARNEGIE COUNCIL GLOBAL ETHICS DAY 2021 'ON THE FOREFRONT OF DEMOCRACY' LEXIMANCER ANALYSIS OF TRANSCRIPT

Source: Youtube https://www.youtube.com/watch?v=xWenb8_Fy4k (Re-accessed 06 January 2022)

The links include to the YouTube transcript on Carnegie Council website
Global Ethics Day Special Event: On the Frontlines of Democracy | Carnegie Council for Ethics in International Affairs (Re-accessed 06 January 2022)

**JOEL ROSENTHAL:** Greetings. I'm Joel Rosenthal, president of Carnegie Council for Ethics in International Affairs. I'm Zooming in today from my office in New York City, and I want to start by thanking everyone on this call for joining us for this special event convened for Global Ethics Day 2021.

Before we begin, I just want to share a little bit of background on Global Ethics Day. Global Ethics Day takes place every year on the third Wednesday of October, and this is our eighth year running. Global Ethics Day began in 2014 as an opportunity for individuals and organizations to explore the meaning of ethics in daily life and to come together to identify the most critical issues facing society. Over the past seven years, individuals from over 75 countries have participated in Global Ethics Day. Last year, during the midst of the pandemic, hundreds of activities were convened on six continents via socially distanced and virtual formats, and you can see the cumulative results of these efforts by visiting globalethicsday.org.

I don't believe it's an exaggeration to say that this past year has been one of the most challenging ever when considered as a matter of history. We've confronted the spread of COVID-19, responded to attacks on democracy, struggled with racial injustice, and battled climate change. It's clear that humanity faces a number of global-scale challenges.

Our program today, "On the Frontlines of Democracy," features individuals who are making a difference on one of the most urgent and concerning issues of our time, the future of democracy. The lives and work of our panelists affirm the idea that ethics matter. Through their activism each of these individuals embodies the Carnegie Council motto: "Ethics empowered."

We're very lucky to have as our moderator Jen Williams, deputy editor at *Foreign Policy*. Jen's outstanding journalism in this area makes her uniquely suited to lead our discussion today.

So, Jen, thanks for your leadership, thanks for moderating today, and I am going to turn it over to you directly. Thanks.

**JENNIFER WILLIAMS:** Thank you so much, Joel, and thank you to everyone for joining us today.

I am going to just go ahead and introduce our brilliant panel today. If you want to read everyone's full bios, you can go to the website and check those out there. I am just going to do brief introductions so we can get right into the meat of the conversation here.

First, we have Nathan Law. Nathan is a Hong Kong activist who is currently living in exile and is based in London. Wai Hnin Pwint Thon—thank you for joining us, Wai Hnin—is a Burmese human rights activist and a campaigns officer at Burma Campaign UK. We have Alfredo Romero joining us today. Alfredo is a human rights lawyer and activist in Venezuela, and then we have Franak Viačorka, who is a senior advisor to Sviatlana Tsikhanouskaya, a non-resident fellow at the Atlantic Council's Eurasia Center, and a journalist from Belarus.

Thank you to everyone. Welcome. Thank you for taking the time to be with us today.

I would like to get started with a question that I think has been on my mind a lot, especially over the last year or year-plus. I think many people today are experiencing a lot of feelings of helplessness regarding the state of the world, and you, our panelists today, each of you work every single day in your lives to actually do the work of defending democracy and to improve the lives of others. So I would love to hear from you. What is your message to people like me and like I'm sure many others out there who feel like maybe there's not a lot of hope for democracy, for the future of human rights, and what actions can we ourselves maybe take to help ameliorate that feeling of helplessness?

Wai Hnin, maybe if you want to start, and then whoever else wants to hop in, please go right ahead.

**WAI HNIN PWINT THON:** Thank you, Jennifer. I think it's a very important question, but it also is a very hard question as well.

I work on the issue of Burma, and given the circumstances since the coup every day is getting harder and harder, and it is difficult to keep hope. But also, sometimes when I am having a really hard time, I realize that it's my job and it's my duty to hold these military and to hold all these bad leaders accountable.

Okay, we are feeling hopeless, but also it's our job to give ourselves hope by doing this work for human rights defenders who are risking their lives on the ground. It's more an up-and-down every day, trying to keep hope and giving ourselves hope by doing the work that we do. I will just keep it there for now.

**JENNIFER WILLIAMS:** Alfredo, maybe would you like to jump in?

**ALFREDO ROMERO:** I am the president of one very big non-governmental organization (NGO) here in Venezuela, which is called Foro Penal, and what we do is try to give hope to all these victims that we actually represent. In this office where I am talking from, we receive victims, people who are being tortured, the families of people who are arbitrarily detained, and people who were arbitrarily detained for political reasons come to us in order to talk and sometimes to say thank you for what we have done about them.

Actually we have worked on the release of more than 12,000 victims of arbitrary detentions. I tell you that because this question feeds perfectly on what I think every day.

"Hopelessness" is a very big word in the sense of, who is hopeless? Someone who is infected by coronavirus in London, for example, or someone who is in jail at this moment for more than six years—for example, one is a student, Antonio is his name—without a conviction and without a trial.

So it is more a psychology issue, I think. What we do every day is try to provide these people with methods and tools in order to go through this very bad moment and to tell them every day, at least from what we do, that they will get freedom at some point, and that is what we do.

We actually—and I will finish with this—touch people. We need to touch people. We need to talk to them. Actually, I'm a musician also, and we sing to people. I'm a lawyer and a musician, and you will say, "Well, does that relate to what we do?" Yes, because we have to sing to them. We sing songs. We go to different towns around the country and sing, and that is a way that we channel or we create this breach between the big thing and us in order to precisely bring hope to these specific people that we attend every day.

**JENNIFER WILLIAMS:** I think that's a really fascinating point. I think the arts and the role of the arts and music, the role that can play in really connecting people, bringing people together, and giving hope doesn't get enough attention. You should perform for us someday. That would be great.

Nathan, did you want to weigh in on this one?

**NATHAN LAW:** Yes, sure. Hello, everyone. I am Nathan.

I think this is a very important question. In Hong Kong the situation gets worse and worse on a daily basis. Every single day we hear about protesters being sentenced to jail for years. We have heard about political campaigners being arrested. We have heard of civil society crumbling. There are lots of decades-long civil society—which are backbones of the Hong Kong democratic movement—disbanded. This is definitely a devastating situation, and I believe that everyone who is paying attention to the situation in Hong Kong would feel like the situation is dire. It is difficult to overturn it in a short-term period.

People find it helpless when they want to reach out for help when they are in jail, when they are in process of waiting to be tried, and when they are basically trapped in Hong Kong and losing the city as they used to know it. Basically the whole Chinese Communist Party is ripping the city off and trying to reform it into the way that they can have complete control in a very authoritarian stage.

But I guess there are differences between helpless and hopeless, and I approach hope in two ways. One is definitely more seen as faith. I think as an activist we are not entitled to lose hope. This is what we are here for. We are here for empowerment, to encourage people to resist, and we are here for bringing out the impetus and the momentum of a movement to try to change something. So to me hope is not very analytical. It sometimes is a matter

of faith. I believe that justice and democracy will prevail. It takes hard work. It takes a long period of dark periods before the sun rises, but I do believe that it will come.

The second definitely is on the people. We have seen social events, really bad ones, on a daily basis, but we can also see that there are people working on the ground tirelessly with lots of risk doing every single little thing that they can do to help the situation. In Hong Kong there are organizations still underground, helping inmates and helping their families. There are still organizations trying to form some groups to look into Hong Kong's future to try to find all the cracks, and there are also people lining up to attend court trials and send encouragement to the people who are in the detainee box and also when they are being transferred to prison. Lots of people run on the side of the car and try to say hello to them and tell them to please hang on.

I think these are the people who are carrying hope. They are doing everything that they could, even in a very narrow political situation, and we will understand that when the time comes these people will also be the force of changing the society. So I guess this is the only thing that we can approach to the situation that seems so dire but that has the possibility of change.

On an analytical level, I do feel like the long-term future, if the world is more reckoning on what China has been doing, their authoritarian aggression and expansion, we still have a chance to safeguard our democracy, protect it, and implement it in Hong Kong.

**JENNIFER WILLIAMS:** Thank you for that.

That segues I think nicely into the next question that I have. All of you work on the ground in various countries, whether you are in the country that you're working for or if you are in exile elsewhere, but you are doing the work day-to-day, the nitty-gritty of trying to keep that hope alive and to really try to make sure that you're working toward this goal, even if it feels so dire.

So I want to know, for those of us in the international community, for entities like the United Nations, country governments, and non-profits, what role can those types of organizations play in supporting the work that you all are doing? What do you really need from these organizations?

Franak, I would like to go with you to start on that one.

**FRANAK VIAČORKA:** Thank you, Jennifer. I just want to emphasize that the fight for freedom is not a sprint, it's a marathon. Of course, we can have the moments of hopelessness. It does mean that we did not win yet, but definitely it does not mean we did lose. Definitely we should stop blaming and making this self-victimization, saying all the time that dictatorships are winning. They are not. Perhaps they are prevailing for this moment, but it's not forever, and as Nathan mentioned, in the end democracy and democratic values will definitely win.

International organizations actually created to help democratic movements like one in Belarus, Hong Kong, or other countries, or Venezuela, are not efficient at all because at

some point the structure, the character of this organization was developed in the 1990s, in the 20th century, when the world experienced and enjoyed the rise of new democracies, the spring of democracies. These organizations like the United Nations, Council of Europe, the Organization for Security and Co-operation in Europe (OSCE), if we are speaking about regional organizations, were supposed to solve problems by consensus, assuming that all organizations and all countries are sharing the same values.

But dozens of years passed, and we saw that many of the Member States who signed up in these organizations share different values, and right now they are basically paralyzed by a consensus-based role like, for example, the UN Security Council, and are not able to take any decision, and what we have to do right now is we have to work on redesigning them and pushing the government or pushing Member States to change the rules, to change the format of how they work.

In the UN Security Council, for example, only informal meetings called "Arria formula" meetings can really take decisions because, when we take the whole UN Security Council members there, they are not able to take decisions because of the veto rule.

Also what we have onboard right now is the big power of the private sector, of tech companies. They are also like governments. The power of Facebook or Google can be compared to the United Nations right now, and we need them, we need their active participation if we want to fight dictatorships and authoritarianism on an international level. So perhaps it is a call to them to be more proactive, to be braver, and to be more consistent in supporting those who fight for democratic values and principles.

**JENNIFER WILLIAMS:** Yes, I think the tech point is really important.

Nathan, I wonder if you wanted to get into that a little bit. Especially with how powerful Beijing is in controlling and cracking down on communications and pushing tech companies to censor material, I wonder what you would like to see from tech companies in that space.

**NATHAN LAW:** Well, for the multinational, multilateral organizations I have taught a lot of activists, and we have come to a conclusion that they are unable to hold powerful countries like China or Russia accountable. Basically they are not in the position of doing things like this, even though they claim that they could do it.

Of course, safeguarding global democracies I think is the most fundamental crisis of our time. We can talk about pandemic, arms proliferation, hunger, and all sorts of things, but seemingly I think for the past two decades a lot of democratic countries are just too complacent about safeguarding our own democracy. They thought that at the end of the day it would magically happen, but it won't with the sophistication of authoritarians or even an authoritarian country like China.

So I think if we want to have change, if we want to have actions, we must have a change of perception. We need to see it as a crisis. We need to make a global agenda, global body, global action plan, and a global timetable to tackle these things like we tackle climate change. I think the only way to do it is by uniting all of these democratic countries, which

have a say and have certain power, whether it is economically or politically, and they do something together in order to address that.

Of course, the big tech companies do play a part in it, and even though they are private companies they are becoming like a public space. Billions of people use it, and they should shoulder some kind of responsibility facilitating this important agenda that would benefit a lot of people around the world. I think we need to have a perceptual change about what we are facing. We are in such big trouble, and we need all the democratic communities to work together to address that.

**JENNIFER WILLIAMS:** Wai Hnin, Alfredo, do either of you want to weigh in on the international organizations? It sounds so far that there is not a ton of faith in these organizations anymore. I am wondering if either of you have thoughts on that.

**ALFREDO ROMERO:** Well, I agree with what Franak said. However, I have been working on this for more than 20 years. You can imagine that we have talked to everyone around the world in order to just get the release of one person or to try to denounce what is going on in Venezuela.

I believe that at this point—I will say something directly and very maybe rude—the international organizations, as Nathan said, are not capable of doing something concrete about what is going on, for example, in Venezuela at this moment. However, it doesn't mean that we don't count on them. It is not that we trust that just counting on them we will get a solution.

We have, for example, a strategic litigation manual. When you read that, of course international organizations are important. But if you analyze all the factors, all the actions that we have to do in order to get, for example, someone released from political prison, the international organization, of 100 percent, will be about 5 percent of all the factors, and this is important because—

First of all, I want to say I am talking about international organizations. I am not talking about international attention. This is different. Raising international attention is extremely important. I want to clear this up. It is extremely important to have, for example, your attention. It is important to have this conversation. It is important that all of the people who are participating in this conversation know that whatever they do, even a Twitter message, even a denouncing that we do internationally, a comment about what is going on in Venezuela, if they refer to a political prisoner in China or Venezuela, this is important because these governments, these regimes care about what the international community says. This is important.

However, are international organizations actually acting the same way as the people want? I believe that sometimes a Twitter campaign, for example, can be more effective to get the release of someone if the international community participated through a Twitter campaign than, for example, going to the United Nations Working Group on Arbitrary Detention that we go to every day. They take so long to respond, and they say it. They don't have much resources and people who can work on that. Is the International Criminal Court, for

example, working efficiently on crimes against humanity happening in Venezuela, China, Russia, and many countries? Maybe they could be effective, but they are not as fast as they should be.

I believe—and I will conclude with this—that this sentence that people use a lot, "Justice takes long," this is something we have to take out of our mind. As human rights activists, we have to fight, and the people who believe in human rights, we have to fight against that. Justice cannot take long. Justice doesn't mean just a criminal proceeding. It means justice in general. It means opinions. It means raising attention about what is going on. It means not to forgive but to fight against oblivion of what is going, to fight against impunity, and not to undermine justice because of a political negotiation, for example. This is something that I believe we need to fight for.

I also agree with what Nathan said, that of course all democratic countries should work together, should unite, must unite, all humans rights defenders around the world, even from the right or from the left because I don't believe that I am a rightist or a leftist. I just work for human rights, and I don't care about this kind of ideology. We have to fight together against impunity, for justice, and for the respect of human rights.

**WAI HNIN PWINT THON:** If I may, I think it's a very good question. I think international community and international organizations play a huge role in part of our democracy movement.

But the problem is that the international community has failed to stand with people of Burma for many years. Just a recent example is 2017. When the genocide of the Rohingya—the Muslim population living in the Western part of Burma—happened, the international community didn't do anything. They banned a few generals from coming to Europe, the United Kingdom, and the United States, and that was the punishment that they got.

The military staged a coup on the first of February of this year, and since then human rights violations happen every day. There are more than 7,000 people in jail right now and more than 1,000 people have been killed. That is only in the city areas.

In the beginning, when we received the statements from organizations like the United Nations and other organizations, we were encouraged to see those. Oh, they were standing up with us, and they were concerned about the situation in Burma. But we were hoping for them to take effective action, and people who were protesting on the ground in Burma were holding signs written in English because they wanted the world to see them. They wanted the world to take action.

But now people inside the country have completely lost hope in the United Nations, and they say UN stands for "United Nothing" because they haven't seen any action coming from these organizations helping people on the ground. They say: "Oh, we are risking our lives. We are prepared to sacrifice everything because we don't want to live under another military dictatorship. We don't want to have the military continue abusing power and continue committing human rights abuses with a sense of impunity."

In our case, the international community has failed us, but that doesn't mean that there isn't anything that they can do to help. There are so many human rights organizations focusing on Burma and asking these entities to take effective actions. We have pointed out what they can do to help people in the country.

But the problem is that the response has been frustratingly slow. That means it is our job to keep pushing. Sometimes it feels like banging your head against a wall, but it is also our job to hold these organizations accountable and push them because we know there are things they can do to help people on the ground, and they have to do it.

As a human rights activist, it is hard, but it is our job to keep doing it and make sure that we have internal pressure and external pressure and we achieve the change that we want to see. So I like to be hopeful and optimistic about it.

**JENNIFER WILLIAMS:** Well, hopefully some members of these organizations are watching today and listening to your voices, and I hope they are getting the same chills that I'm getting when I hear you all speak about this. The "fight against oblivion" that Alfredo mentioned was really, I think, a powerful statement and the need to focus on pushing and fighting for today. I heard from a lot of you talking about the time delay and how long everything takes and the need to keep everything in the immediate forefront of people's minds.

Speaking of institutions, we often talk about the critical importance of institutions within democracies as well. I would love it if each of you could talk about some of the tactics that have been used to weaken the institutions inside your own countries and how you are fighting to kind of counteract that.

Alfredo, you in particular, you wrote a book on the strategy behind autocratic regimes. I wonder if you want to start on some of the tactics that authoritarian regimes are using, that the Maduro regime is using in your country to dismantle and co-opt the institutions of democracy.

**ALFREDO ROMERO:** Thank you for that question because actually what I believe, talking about the strategy, the new strategy of these dictatorial regimes is actually to use the judicial system as a façade in order to show the international community that, for example, when a political prisoner is being incarcerated or when somebody that is protesting or demonstrating is incarcerated he is not or she is not someone who is demonstrating democracy and defending his or her human rights. It is because it is someone who is a terrorist or is a criminal, and they use the judicial system, these institutions, in order to send the world a message, to tell the world, to tell the international organizations that what they are doing is justice, that they don't have the responsibility for what this independent judge did against each specific person.

This is not the truth. I work every day with the courts and with all these kinds of issues, and I am totally sure that nobody is independent here. The judges take a decision to incarcerate someone on pre-trial detention for years, I mean without conviction, just because they wait for someone to call them and tell them what to do.

This is very important because I still, after many years of looking at the same thing and denouncing the same thing, some people in the international community or some diplomats, just to call it that way, are still believing or presenting this situation as an excuse not to get involved in, for example, when a political prisoner is in jail or suffering torture or whatever. This is I think extremely important.

Of course, this is a very long discussion, but I believe there is something that, for example, in Venezuela the government has succeeded, and I am sure it happened because I know the situation in Cuba and in Nicaragua, for example, and a little bit in Russia and maybe China, but the diplomats play the same game, for example, with political prisoners.

Political prisoners are in jail, and they become hostages. They become bargaining chips for political reasons, and they use—as I said in my book as you referred to, and thank you for referring to that big paper—political prisoners in order to get some benefits from the international community. They use political prisoners. The use this game, what I call the "revolving door effect," so they incarcerate, release and free people, and they then imprison others in order to use these people as bargaining chips.

You will see the same situation happening in China, Cuba, Russia, and Nicaragua. Whenever diplomats come to negotiate and try to solve the problem politically in Venezuela, they will always use political prisoners to say, "Okay, I will release them," and this is a gesture in order to tell the world: "Oh, you know I'm doing the right thing," and this word—I don't know if you guys who are working also in human rights you have heard this word many times. I have heard from diplomats this word many times, a "gesture," and they ask me: "Alfredo, what do you think is a good gesture of the government? If they release 40 political prisoners? One hundred? What is the right number?" There are 269 political prisoners and more than 9,000 people who were released but still with restrictions of their freedom.

I will say, "Come on. You will ask me about a gesture? You have to release everyone. How will you negotiate with a government that is using the same game all the time, and when they release some they will get some kind of good message from the world that they are doing the right thing, and they will incarcerate the same ones the next week, the same amount of people that they release." This is really something that is happening. So, institutions again are a good façade, and it is not like before in the past that dictatorial regimes are just doing things without protecting themselves by their own rule of law that they have always used to skew, to justify their political repression.

**NATHAN LAW:** Maybe I can chime in to talk about how—not internally—these authoritarian regimes externally try to even persecute or do anything to stop us from voicing and getting support from the international community. I think this is a big problem especially from what the Chinese government has been doing to me and to other Hong Kong diasporic communities and activists. They have several things that they are very good at and used to use.

For example, stigmatization. They always claim Hong Kong protests are U.S.-instigated. They always claim activists are U.S.-trained CIA agents and have a lot of connections with

foreign governments or that they do things like this in order to discredit us and also to make sure that we are depicted as someone of evil intention and trying to destroy China because of the guidance of other "malign foreign forces."

This is very common, and I personally have been stigmatized and faced a lot stigmatization campaigns from Mainland China and even the most heated topics in Weibo, which is the Facebook and Twitter in Mainland China, well, the whole propaganda machine was talking about false information in order to discredit you.

The second would definitely be using their economic and political power to de-platform you. I have attended university talks that some of the alumni association of the university wrote a letter to the one organizer saying that, if they continue to have that talk with me, the Chinese relationship with that university will be damaged. They lay it out very vividly.

They are also some I didn't attend. They canceled the invitation because they said that investors or sponsors have connections with China and it put off some of their members in mainland China when they heard that I was going to participate. They were pissed off, and they tried to do things to threaten to cancel their support. These things happen, and it gives a lot of pressure to organizations and institutions that are trying to provide a platform for human rights activists to have a voice, but they are being affected in that way.

Of course, it is not only to institutions but also to governments. I can also sense that there are certain elements even in the current U.S. administration that are worried that meeting with me or people like me may worsen the relationship, like displaying a certain hated image of the administration to the Chinese government. I was told by some of the analysts, some of the people around, that they have a tendency to avoid getting in contact with activists like me and the others.

I think this should be changed, even though it would be talking about how incapable the international organizations are to holding the authoritarian regimes accountable, but the very least that we could do is we have a platform for us to promote our narrative and counter those narratives from these malign regimes that abuse human rights violations and use propaganda and false information to stigmatize everyone, and then we can generate certain forces to make a change, no matter whether it is on the government level, on the consumer level, and on the cultural level. At least this is what the international community could do in that way, but seemingly they are not doing enough, and sometimes that disappoints people when even the government is also reacting to that play from, for example, the Chinese Communist Party, and trying not to provide as much support as they could to overseas activists.

**WAI HNIN PWINT THON:** If I may, I think both points made by Nathan and Alfredo are very interesting. There are a lot of similarities happening in Burma as well, especially when it comes to political prisoners. Whenever there is international pressure, political prisoners will be the first to be released because they are being used as a token. And again, it's the same term, the "revolving door," because the population of political prisoners keeps growing. Yesterday and the day before yesterday there was a release of political prisoners.

There were incidents of them being picked up outside prison after being released. It's really heartbreaking.

In terms of institutions but now especially after the coup, the Burmese military tried to show the world the appearance of law and order and that there is a legal process happening, so they allow all these political activists in prison to have legal counsel, although they have no privacy to discuss about their case in detail. All of the charges are politically motivated for sure, but they want to show the world: "Oh, look. These people are being tried legally, and they have lawyers." Some in the international community really fall for that as well.

In terms of action and everything, sometimes we see that all these powerful governments prefer to keep the diplomatic or bureaucratic relations with the head of state or at least with an authoritarian regime rather than helping people on the ground and helping people and supporting their cause.

In my case, I remember in terms of institutions and how the Burmese military has made us feel as a political activist that is something to be ashamed of. Now we have a lot of doctors, teachers, and nurses sitting inside prison for taking part in the anti-coup protests in the country. Once they come out, they will lose their license to practice. They won't be able to become teachers or go back to their old jobs anymore, and they have criminal records, so it will be impossible for them to find a new job.

That is the same case with my dad. When I was growing up, he was a political prisoner, and I was ashamed going to school. I was ashamed to tell my friends that my dad was in prison for doing the right thing, standing up for human rights and democracy in my country. I was ashamed to say that because everyone thinks, *Oh, your dad is a bad person because he is in prison*. It took me years to realize what he stands up for and what he believes in.

It is like that for many generations, and that is encouraging for many people inside the country to see, that different generations are coming together to protest against the coup, and the resistance is growing every day. I repeat myself that that growing resistance needs to be backed up by the international community, and they have failed to do that because they are considering, *Oh, will this upset the military?* or *Will we be kicked out of the country if we support the legitimate government elected by the Burmese people?* There are so many things people can do, and we are doing our part, and we want the international community to support us as well as a human rights activist outside and a human rights activist inside the country as well.

**JENNIFER WILLIAMS:** Franak, did you want to add anything to that?

**FRANAK VIAČORKA:** I see the trade of political prisoners in the usual thinking of almost every country. What we have to do is we have to raise the price for each political prisoner and for each repression. We should make all such regimes toxic to the entire world, and of course it is much easier if we unite efforts. One, the regime will know that for each political prisoner it will have to pay with real money, with real resources, and then it will have good incentive to not do this.

Of course, international organizations have again, such as Red Cross and others, which are supposed basically to help political prisoners and prevent tortures or to help those who are injured by the regimes, very often serve dictatorial regimes, and that is another issue we should raise internationally, how these organizations, including how the UN departments and the UN institutions really help. So basically we have to make a reassessment of efficiency of each tool created by international organizations.

In Belarus we have right now 815 political prisoners and more than 2,000 political prisoners who are not recognized as political prisoners. We use the classification of the Council of Europe, which means, for example, people who are not under political articles are not recognized as political prisoners. So also the methodology of recognition of political prisoners must be revised definitely.

We also see that those who are recognized as political prisoners often face harsher treatment, and many families decide to not be recognized as political prisoners so they can receive a shorter jail term or have better conditions in prison. That is not very healthy.

Also, what we faced after Roman Protasevich, the young journalist from Belarus, who was kidnapped from the plane flying from Athens to Vilnius on the Ryanair flight, he is a good friend of mine, and we basically took the same flight just a week before, and we were actually perhaps the target of this operation. He was tortured, blackmailed, he was on the hook, something happened, and after three or four days he started praising Lukashenko, praising the totalitarian regime, saying: "Oh, that's democratic forces. They were wrong. They hijacked this plane."

Basically, in the beginning I was very angry—how such? How unethical. They used a hostage in order to discredit opponents, but then I realized that they should not definitely blame Roman for collaborating because we have to put his life first, and all the things political prisoners and hostages are saying publicly or not should not be counted, should not be discussed, and should not be quoted by media. That is the best thing the media can do actually, to not multiply the lies and words of hostages and definitely to not give tribune to dictators. This is what happened to CNN, which had an interview with Lukashenko a few weeks ago and gave him actually the space and tribune for multiplying lies and propaganda.

**JENNIFER WILLIAMS:** I think that's really helpful. For me, as someone who works in the media, I think that is something that I know I and many of my colleagues in journalism think about a lot: *Who are we actually giving platforms to speak, and how are we presenting*—on the one hand, we want people to know the facts and what is going on in a situation in a country, but how do we present that in a way that doesn't amplify lies, propaganda, etc.? So I think that's a really important point. I know all of you have made some really powerful points on the political prisoner question in particular.

Before I do the next question, I want to remind the audience to please, while we are talking, if you have questions, drop them in the Zoom chat. We will go to a Q&A at the end, so as we're talking if you have questions, please go ahead and drop those in now.

My next question for all of you: The international community, the outside world, often focuses on the leader, one single leader in a country, a strongman, whoever is the person in power. But I think we have seen many, many instances, in particular with the recent release of the Pandora Papers and previous releases of these documents, just how corruption really plays into supporting and propping up these individual leaders. I think a lot of the people who surround these leaders and maybe aren't the ones who are in the spotlight often help support that regime and help the regime really stay in power.

I wanted to get your thoughts on how corruption, patronage networks, and things like that in your particular countries have really permeated the system of power and how you see that as propping up the system, and ways to maybe start to dismantle that.

Alfredo, do you want to weigh in maybe on the corruption side? I know Venezuela has featured prominently when it comes to the Pandora Papers and the "Paradise Papers."

**ALFREDO ROMERO:** Well, corruption is part of the system. We don't actually study that specifically. It is not something that we have analyzed profoundly. However, we can see it everywhere.

I always say that whenever you are in some way isolated from the world—because remember that the Venezuelan state is being sanctioned by the United States and different other states, and what happened internally, what you see is corruption like everywhere. You don't know where the money comes from. You don't understand, for example, how they build buildings, they invest in different businesses all around the country, what is happening right now, when there is not even credit from a bank.

Corruption should be linked to the human rights issues. Actually, there is I believe a judge, also a professor at Harvard, Mark Wolf [who is pushing for] an International Corruption Court in order, I will say, to prosecute all these kinds of things, but again maybe I am talking too generally because I don't want to talk about specific issues, not in Venezuela right now.

But, yes, the big answer is that I believe that corruption is, of course, part of the system, is a day-by-day issue that you see everywhere. It is something also difficult to talk about publicly.

**JENNIFER WILLIAMS:** Yes. I don't want anyone to get yourselves in trouble. That is the last thing we want here. I absolutely respect that.

We are getting short on time here, and I want to get to the Q&A section. I have one final question before we get to some of the audience questions that I would love each of you to touch on, and it's a really simple question: Why democracy? We have seen—I think there are polls that show something like 55 percent of Millennials globally say they are dissatisfied with democracy. What is your pitch to the younger generation on why democracy itself is critical and why it's something worth fighting for? I would love to hear from each one of you before we move on.

**WAI HNIN PWINT THON:** Thank you. Because why not? Now we are having this panel, and it is really encouraging to have this discussion and talk about challenges that we have in our line of work very openly without facing any consequences. I don't have to fear that police will break into my home now and arrest me. That is part of human rights, that is part of democratic values, and that is what we are fighting for. Because otherwise, we are talking about China, Venezuela, all of these countries have similarities of repression going on. People are being arrested for standing up for their rights. People are being arrested and tortured for speaking about truth. I think democratic values are very important.

In Burma, because we have a lot of diversity and ethnicities in the country, people are not calling for simple democracy anymore. People are calling for federal democracy with proper, genuine federalism. It is a very encouraging step for us to move forward.

If we don't have any democracy—I notice in Western countries it is not a perfect democracy either. There are so many challenges. But at least we are able to go out freely and we are able to converse freely about what we believe in. I think these values are very important, and I know it is a work-in-progress in Western countries as well, and it is part of our job and individual duty to uphold these values and hold leaders accountable if they stray from the path as well. That is what I believe in.

**NATHAN LAW:** Maybe I could jump in. I believe democracy is definitely more than an election. It is more than votes. It is about how we live our lives and how we have a system that can respect everyone's choice, promote diversity, and promote basic respect for everyone.

I think sometimes, yes, indeed, in democracy they make mistakes and we may have election results that may damage democratic values, its essence, but this is definitely the learning process that we have to adopt. At the end of the day, democracy is the protection of our other important aspects, like rule of law, like basic human rights, like freedom. In Hong Kong's case you can really see that—a city once so free, but without the protection of democracy, without holding the government accountable, your freedom and your rule of law can be lost in just one year, in just a glimpse. I think this is what democracy is about, and that is why we have to protect that as a system and as a value.

**FRANAK VIAČORKA:** I can just add to the previous speakers that democratic countries are usually prosperous as well, so democracy brings many, many other things, but also it is very important that democracy must go together with independence. For countries like Belarus it is super, super-important. Sometimes we are given the choice, like, "You should decide for democracy or independence." In our case, the propaganda says, "If you will be democratic, you will become part of Russia, or you will have dictatorship but an independent state."

This is a fool's dilemma, and I think in many countries around the world, such that they may exist, we should not support it. We should break this dilemma. It is fake. It is false. We can get both sovereignty and freedom.

Democracy is also something that must be learned. We see that for countries with many years of non-democratic regimes it takes much longer to build sustainable democracies, and those who have democratic traditions since the Middle Ages, for example, for them it could be much, much easier to get back to this. So democracy must be learned. It must be something that everyone must enjoy. Somehow [audio Glitch] perception.

Democracy is the choice. We have this choice to [audio glitch], and I think with dictatorial regimes it is not a choice sometimes. It is just a given situation, a circumstance many people don't want to leave. In most countries democracy is a conscious choice.

**JENNIFER WILLIAMS:** Alfredo?

**ALFREDO ROMERO:** I agree with my colleagues. As Nathan said, democracy is more than just elections. It is more than that. As I said before, these dictatorial regimes also use elections as the way to show the world that they are being democratic. I think, for example, the rule of law from the understanding of the Americans is totally different from my understanding. Rule of law can be used, it could be the Nazi rule of law, where laws and judges do things against human rights, and there could be the Russian rule of law, the Venezuelan rule of law, the rule of law that they use.

Rule of law, for example, I believe is more than rule of law as such. It is the democratic rule of law. What is democratic rule of law? That means the respect of human rights, for example. That means the understanding that elections are not just the only way to show that you are a democratic regime. It is more than that. For example, it is the independence of the judicial system. As also Wai Hnin said, the freedom of speech, the freedom of walking on streets without fear of being detained because, for example, you talk about corruption, you talk about something that is going on in the government.

It is difficult. It is difficult to explain. I am sure all of us understand what is going on, all you guys understand what is going on in Venezuela because in Belarus it is almost the same thing or in China, but not many people understand that. People believe that democracy is just elections, for example.

There is also another thing, because democracy means—do you know what these governments try always to do? They are sustained on three pillars—repression, co-optation, and legitimation. Sometimes they control these two very well, co-optation and repression, but what they always fight for, at least to get from the international community, is legitimation.

But lately what I have thought in talking about democracy that means legitimation because when you are legitimizing, you have elections and everyone will say that you are legitimized, that you are democratic. But more than that, what worries me—and taking from what Nathan said—is normalization of, for example, this whole situation. To normalize having political prisoners is something that is regular in these kinds of countries.

I remember once—and I will end with this—talking to some Chinese people. I was part of the Global Agenda Council of the World Economic Forum, and I was part of this rule of

law group or whatever, and some Chinese people told me, "Well, we have our own rule of law, so we have rule of law."

I said, "Yes, you have rule of law. You have democratic rule of law?

"Yes."

"Do you have democratic rule of law?"

Right now, China is kind of normalized in these kinds of things because everyone is investing and wants to protect their money, so nobody cares about political prisoners anymore, at least from this part of the world. Nobody really cares about what is going on. Well, I care. It is not something that people actually know, that there are still political prisoners in China. What they care is how they can get money from China, how they can import things and, of course, how COVID-19 originated in China or whatever.

Nobody actually talks about political prisoners anymore. Why? Because the Chinese have been the experts of normalizing these human rights abuses, and they have taught that to the Cubans, that right now they are very good experts of normalizing, for example, the existence of political prisoners and human rights abuses.

**JENNIFER WILLIAMS:** Thank you all for those really powerful answers. I think one of the things that tied a lot of your thoughts together that I heard was not taking democracy for granted. It's something that you have to continue to fight for, that it's not just the veneer of democracy, it's not just elections, it's not just labeling something "rule of law" but actually fighting to make sure that those things are real, are held to account, and are able to persist. I thank all of you for contributing that.

Just a reminder. If you have questions, add them to the chat. We have gotten a few really great questions, so I am going to take a look at those.

One question from Bernard Lucas for Wai Hnin in particular, talking about how the United Nations didn't take action after the military coup, etc. There is another question related to that talking about Responsibility to Protect (R2P), the idea that taking international intervention, whether it is military intervention, humanitarian intervention—what do we think about that in terms of why—if you think, in the 1990s in particular with the Balkans, the Responsibility to Protect really became this doctrine of arguing for military intervention, and I think we saw the kind of backlash to that, and I think the U.S. wars in Iraq and Afghanistan have also really dampened enthusiasm for international intervention.

I would love your thoughts, maybe Wai Hnin, if you want to start, on the role of Responsibility to Protect and the way you all think about that and international intervention. Is it something that you in particular would like to see more active intervention by countries, whether it's the international community or a specific country, or how are you thinking about a kind of intervention piece of all of this?

**WAI HNIN PWINT THON:** R2P is a very interesting question. When the protests started in February and March, a lot of people on the ground were calling for R2P. They really wanted military from the United States or even the UN peacekeeping force to come and intervene and help people on the ground.

My opinion is that R2P and also international intervention, at least military intervention, is an out-of-date mechanism. I don't think it can happen today. Also, there is no political interest to go and invade Burma—or, not invade, I mean military intervention in Burma.

Oftentimes when we try and ask for R2P, we tried that in the past in 2008, when Cyclone Nargis happened because the military blocked humanitarian aid to people in the country. So we proposed R2P, and again in 2017 when the genocide of the Rohingya happened, there was a proposal for R2P as well, but the problem is China and Russia will always veto it. Even if countries support R2P, it doesn't mean a military intervention. It can mean a statement or concerns, the same things that we have been having from the international community.

Oftentimes what we have is that whenever we talk about R2P we just argue about what should be in the R2P and what kind of things should be included rather than taking action and rather than focusing on what they can actually do to help, where we end up spending so many hours, so many days arguing about, "Oh, this is not the right thing for R2P, this is the right thing." We don't want that distraction.

Let's forget about R2P. The simple thing the international community can do is arms embargo. Around 150 countries in the world don't have arms embargos on Burma. Despite the fact that the military has been breaking international law for decades, they are still able to buy weapons from abroad. These simple things can be stopped. We don't need the United Nations Security Council (UNSC). Countries can do it unilaterally, but they are not doing that—and things like sanctions, and things like holding the military accountable. These things can happen outside of the R2P. R2P is an outdated mechanism, and we should be focusing on effective action, and we are pushing governments around the world to actually get on with it and take effective actions against the military.

**JENNIFER WILLIAMS:** On that note, there is another question that is kind of related to the international organization question. This comes from Aurelio Yurigoyan [phonetic]**.** There is a political global trend to eliminate funding for international organizations. You all mentioned, as we talked earlier, that these organizations like the United Nations and other multilateral organizations have not been up to the task. But Aurelio says: "Yes, they may not be working as they should be, but eliminating them would probably be worse." So what actions in particular do you think these kinds of organizations like the United Nations, like the Council of Europe, like OSCE, etc., should be taking to be better and more impactful on the issue of human rights?

**ALFREDO ROMERO:** This is a very good question because funding is actually what moves, I believe, these kinds of organizations. Maybe I'm wrong. I'm speaking for myself and what I think.

I believe, for example, Franak said something about the Red Cross. That is not a public international organization but depends on many funders. I am, for example, extremely frustrated about the Red Cross in Venezuela. They are here in Venezuela. You see cars all around Venezuela, beautiful cars. You see people, and they don't even receive us at their offices because they feel if they receive civil society like an NGO like Foro Penal, which is an NGO that represents political prisoners who are sick, who are in jail, and who needs their attention, maybe the government won't like that. I have sent many letters, and it is something that I have said that is public, to the representative of the Red Cross in Venezuela. He doesn't even respond. He doesn't want to receive us.

They depend on funding of—what I want to say, this is an example, and I will extend a little bit the example because it's important. For example, there is a political prisoner. Her name is Emirlendras Benitez. She has been for more than three years in prison, on pre-trial detention, which means without conviction. She was tortured. She denounced that she was beaten that way, that she was forced an abortion when she was in custody, and she is sick. She cannot even walk at this point because of what she said happened to her.

Anyway, she has very important health issues, and I don't see the Red Cross there anytime. But again they depend on funding of, for example, governments. That's the point.

International organizations depending on funding from governments. That's why it's important that governments that believe in democracy and human rights are the ones that have to put pressure on these international organizations not to be comfortable. I am not talking about everyone because I have very good friends who are fighting and are part of the United Nations, and I don't put everyone in the same group, and they are working very hard. We work very close with the UN representatives of the Office of the High Commissioner for Human here in Venezuela. We talk to them all the time, and they have helped also in different things.

But there are others that do not work very efficiently, and I think that is something that we—civil society—should do. And the democratic governments united, as Nathan said, should also put pressure on these international organizations to do the right thing, also to the Red Cross to do the right thing. If nobody says anything and we just from Venezuela are saying that, but if nobody is helping us saying that specifically to those organizations when they act wrong or don't do whatever they have to do, they will be comfortable doing what they're doing because nobody is telling them anything, and also governments are providing funding to them.

**JENNIFER WILLIAMS:** What I'm hearing you say in particular, in addition to the funding, is that some of these organizations that try to act with neutrality maybe end up doing more harm because they are too afraid to help anyone who might have a whiff of being political or involved in politics and maybe pushing them to be a little bit more active in that space.

Franak, you had a comment you wanted to make?

**FRANAK VIAČORKA:** Yes. I just wanted to add, in addition to what Alfredo has mentioned, international organizations must remember they must serve people and not governments because very often, especially in countries with disputed government, with disputed legitimacy, international organizations always prefer to work with those who are de facto in place. Sometimes it helps, but in most cases it doesn't because it eliminates the representation of civil society, of people of the majority often suppressed by dictators. Dictators in most cases are in the minority, and in case we are able to redesign the international organizations to make sure that they serve the needs of people and societies but not governments, it will help.

To give you an example, the OSCE—and right now, since Lukashenko is not recognized by the majority of EU countries and European Commission (EC) members, on one hand he does have legitimacy. On the other hand, there is an EC organization which still invites representatives of Lukashenka because he is included as the government in the OSCE, and they don't make them put much effort to change this paradox.

The second thing that can be changed is the rule of voting. Right now in most cases there is consensus-based [voting]. It is a different organization. Interpol and the International Civil Aviation Organization (ICAO) right now are dealing with this Ryanair hijacking. They can't punish Lukashenko because there is a consensus-based decision-making process, same as the UN Security Council, and I think we are in a situation where always there is one country that will abuse this organization so it can be a consensus-minus-one, consensus-minus-two, or just a simple majority in order to take decisions so some outliers will not be able to manipulate the results.

**JENNIFER WILLIAMS:** Wai Hnin or Nathan, do either of you want to weigh in on this one?

**NATHAN LAW:** I think there is lots of discussion on whether we should defund or whether we should reform. I think the core is what we can do with those kinds of resources, and we have the option of it. I think the input from the international community to human rights work should be increasing, but do they really have an effective platform for now, or should we establish another one or reform this one? So I think sometimes when people say "defund," similarly it means that you just pull off that money, put it back into your pocket, and then just go away. I don't think that is a constructive discussion.

One we should think of is how we can have an effective mechanism. It could mean democratic countries setting up their own alliances in terms of putting forward policies with the mass of their economy or the mass of their cultural and political work to support overseas activists to gain cultural and social influence. These are possible options that we can utilize the resources that we have and explore what avenues we can help.

One of the key factors of us having activism, especially international activist work, is for the international audience, including people living in democracies, to understand how fragile democracy is and how we should not take it for granted, and we do it by telling stories, stories of political prisoners, stories of ourselves, stories of our country and our city, and that requires a lot of cultural resources and social influence to achieve our goal.

So I think there are lots of potential avenues that we could go for. It is not necessarily the old policy and political-making process that we imagine. Actually there are a lot of ways that we could really promote stories to increase awareness and to make sure that our voices are being heard.

This is also people campaigning on an international level. We can really make an impact, and that is why a lot of authoritarian countries are trying so hard to de-platform all of us and to try to use economic coercion and intimidate anyone who invited us and provided a platform to us to say, "You should not talk to him, you should not talk to her." That is another way that we can think of this question.

**JENNIFER WILLIAMS:** I think Carnegie Council is certainly not intimidated and is very happy to talk about these issues. I want to thank you all for sharing those stories with us today.

Joel, did you want to say a few words in conclusion?

**JOEL ROSENTHAL:** Thank you. I want to thank you, Jen, and thank all the panelists.

Nathan, that was just an amazing summary, wonderfully said and quite eloquent.

Our organization is all about ethics in international affairs, and as I said at the beginning, you all embody that in your work and in your lives. We admire that, and we are really proud to provide this platform for you.

We hope that you, the panelists, and of course, all the people who joined the call, benefited from this exchange. It is important for all of us to form a community, to be talking to one another, to be sharing ideas and sharing experiences, and to take them into our lives.

I just want to thank you for coming into our lives today and to assure you—I think Franak said before—it's never over. It is just a moment in time. We think of this as a continuum in the best possible way. I hope we will see you at some point in person, perhaps in New York or someplace nearer to you, and welcome to the Carnegie Council community. While we are going to adjourn this session now, we hope this is just the beginning of a longer conversation.

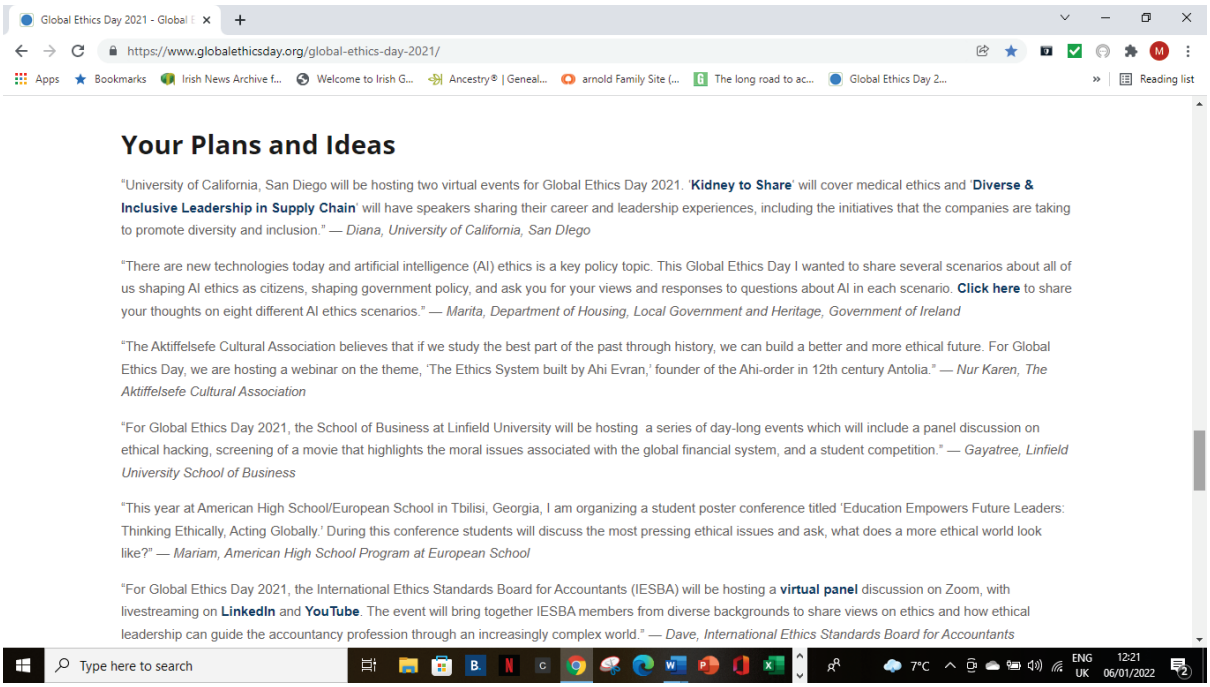
Thank you all.

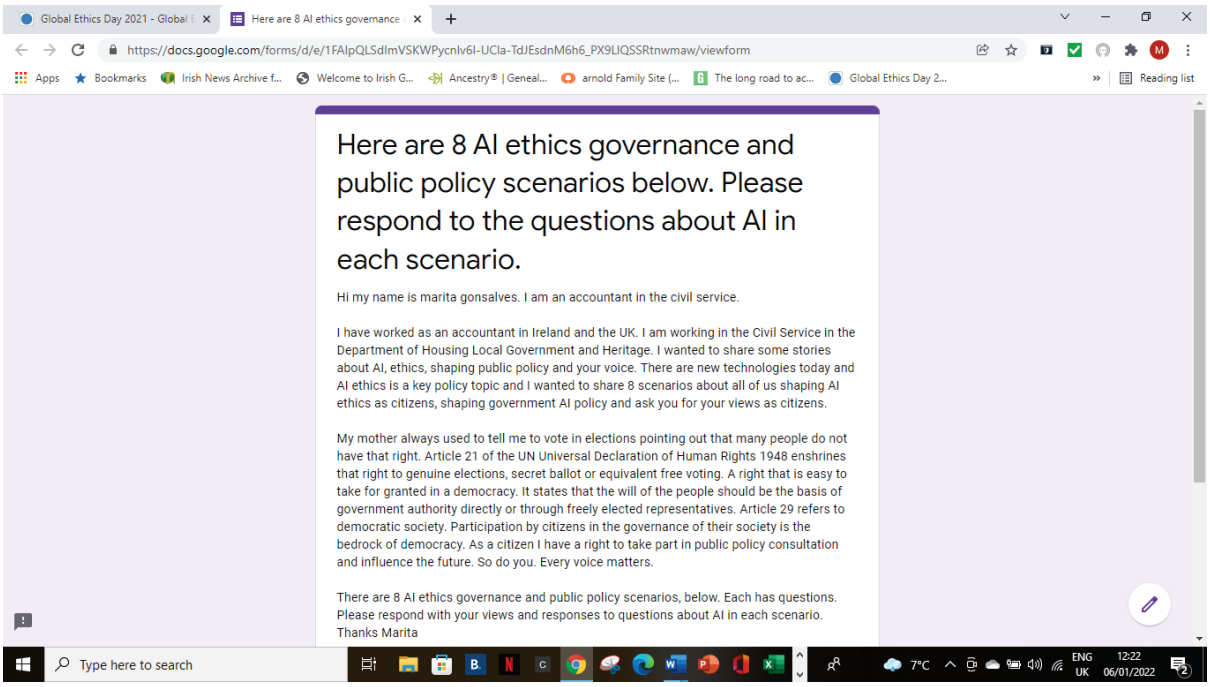
# APPENDIX F: ACTION RESEARCH CHAPTER 4 CARNEGIE COUNCIL

# GLOBAL ETHICS DAY 2021 AI SCENARIOS

## AI SCENARIOS MARITA GONSALVES LINK ON THE CARNEGIE COUNCIL GLOBAL ETHICS DAY WEBSITE

### AI Scenarios link under Plans and Ideas

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Here are 8 AI ethics governance and public policy scenarios below. Please respond to the questions about AI in each scenario.
Hi my name is marita gonsalves. I am an accountant in the civil service.
I have worked as an accountant in Ireland and the UK. I am working in the Civil Service in the Department of Housing Local Government and Heritage. I wanted to share some stories about AI, ethics, shaping public policy and your voice. There are new technologies today and AI ethics is a key policy topic and I wanted to share 8 scenarios about all of us shaping AI ethics as citizens, shaping government AI policy and ask you for your views as citizens.
My mother always used to tell me to vote in elections pointing out that many people do not have that right. Article 21 of the UN Universal Declaration of Human Rights 1948 enshrines that right to genuine elections, secret ballot or equivalent free voting. A right that is easy to take for granted in a democracy. It states that the will of the people should be the basis of government authority directly or through freely elected representatives. Article 29 refers to democratic society. Participation by citizens in the governance of their society is the bedrock of democracy. As a citizen I have a right to take part in public policy consultation and influence the future. So do you. Every voice matters.
There are 8 AI ethics governance and public policy scenarios, below. Each has questions. Please respond with your views and responses to questions about AI in each scenario.
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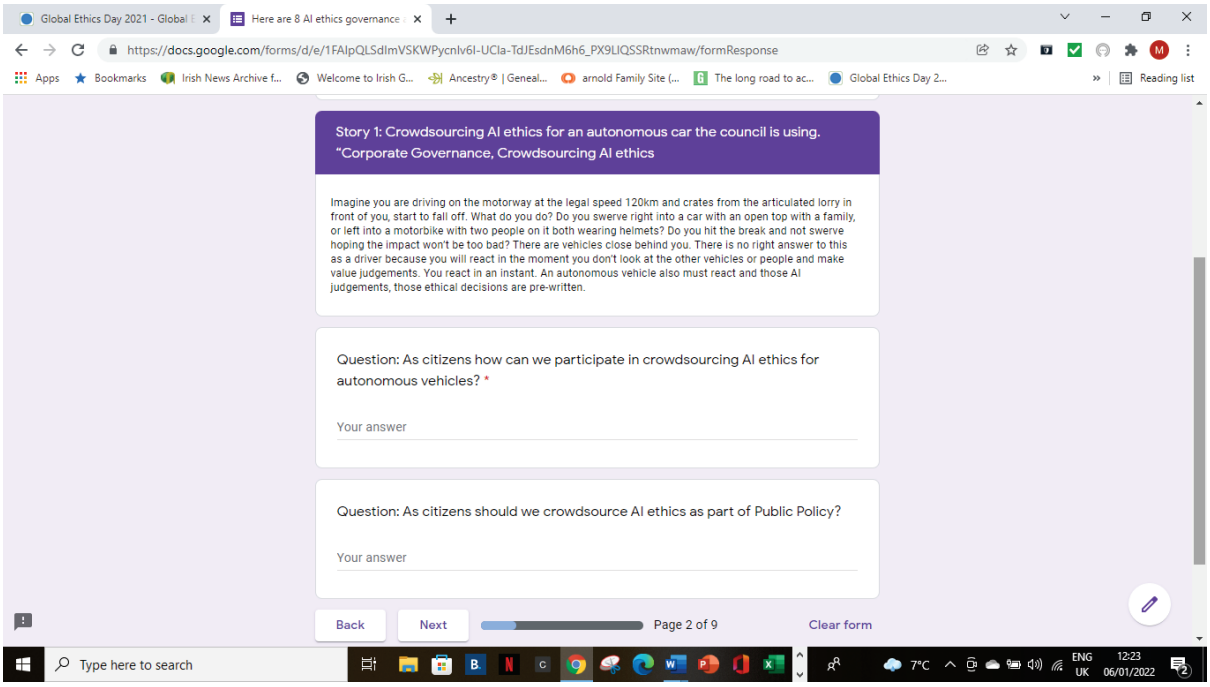
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Story 1: Crowdsourcing AI ethics for an autonomous car the council is using. "Corporate Governance, Crowdsourcing AI ethics
Imagine you are driving on the motorway at the legal speed 120km and crates from the articulated lorry in front of you, start to fall off. What do you do? Do you swerve right into a car with an open top with a family, or left into a motorbike with two people on it both wearing helmets? Do you hit the break and not swerve hoping the impact won't be too bad? There are vehicles close behind you. There is no right answer to this as a driver because you will react in the moment you don't look at the other vehicles or people and make value judgements. You react in an instant. An autonomous vehicle also must react and those AI judgements, those ethical decisions are pre-written.
Question: As citizens how can we participate in crowdsourcing AI ethics for autonomous vehicles? *
Your answer
Question: As citizens should we crowdsource AI ethics as part of Public Policy?
Your answer
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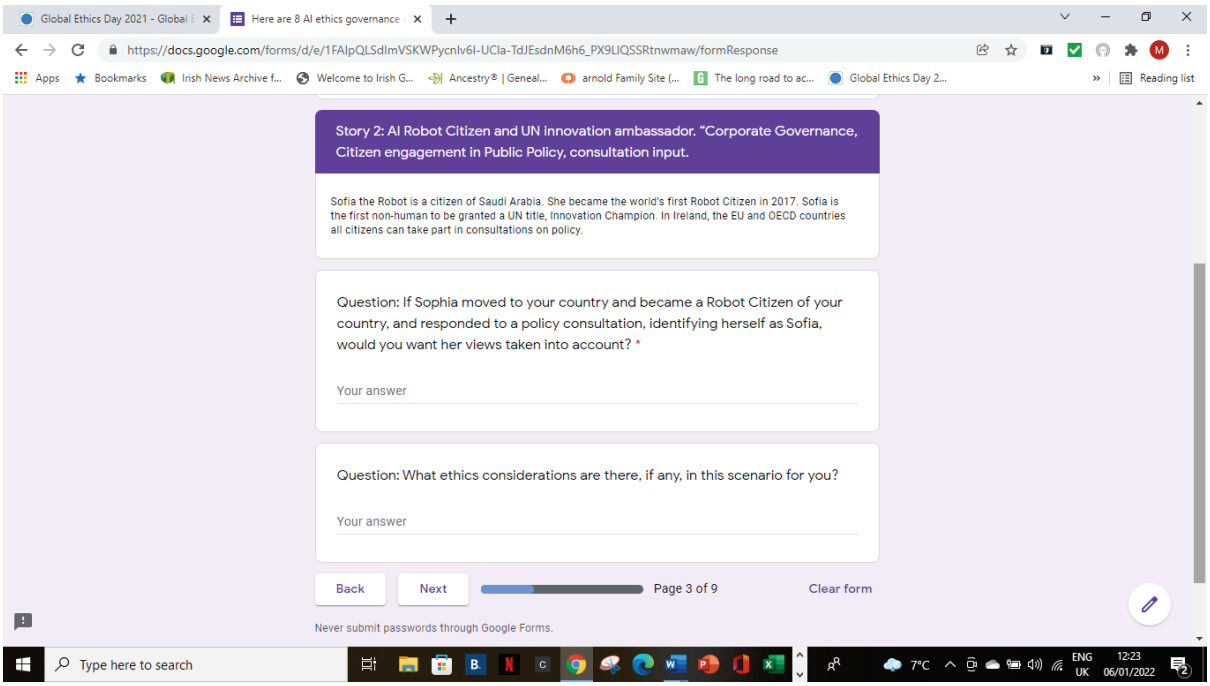
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Story 2: AI Robot Citizen and UN innovation ambassador. "Corporate Governance, Citizen engagement in Public Policy, consultation input.
Sofia the Robot is a citizen of Saudi Arabia. She became the world's first Robot Citizen in 2017. Sofia is the first non-human to be granted a UN title, Innovation Champion. In Ireland, the EU and OECD countries all citizens can take part in consultations on policy.
Question: If Sophia moved to your country and became a Robot Citizen of your country, and responded to a policy consultation, identifying herself as Sofia, would you want her views taken into account? *
Your answer
Question: What ethics considerations are there, if any, in this scenario for you?
Your answer
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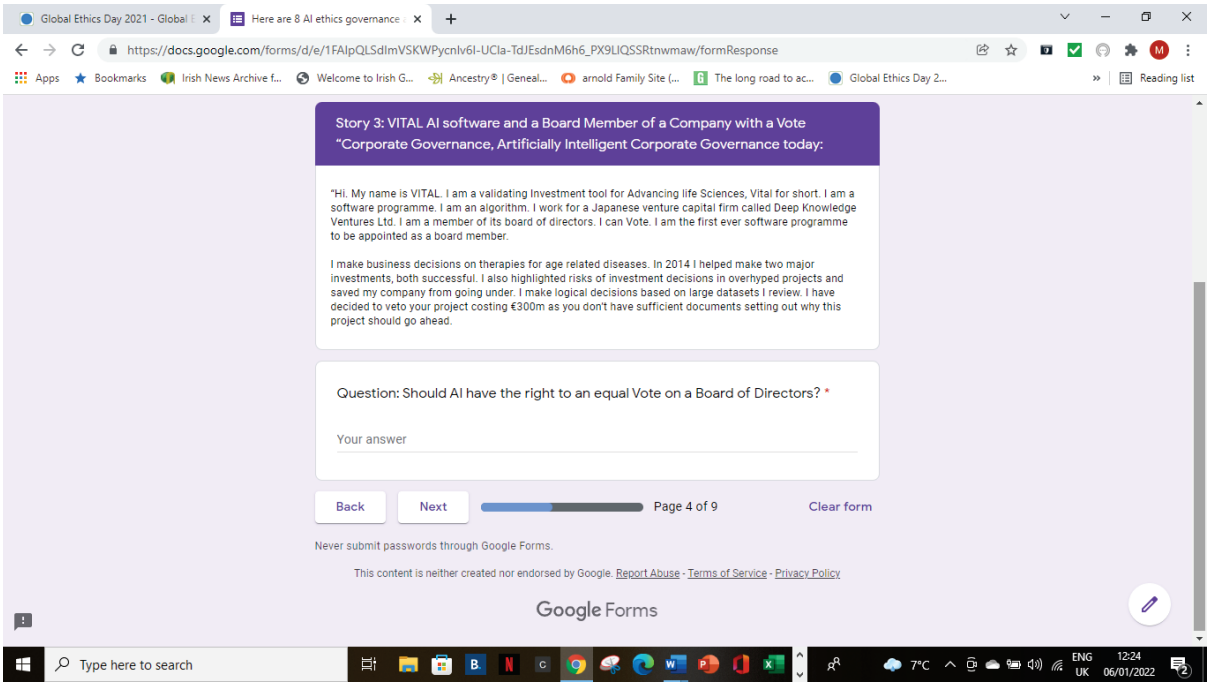
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Story 3: VITAL AI software and a Board Member of a Company with a Vote "Corporate Governance, Artificially Intelligent Corporate Governance today:
"Hi. My name is VITAL. I am a validating Investment tool for Advancing life Sciences, Vital for short. I am a software programme. I am an algorithm. I work for a Japanese venture capital firm called Deep Knowledge Ventures Ltd. I am a member of its board of directors. I can Vote. I am the first ever software programme to be appointed as a board member.
I make business decisions on therapies for age related diseases. In 2014 I helped make two major investments, both successful. I also highlighted risks of investment decisions in overhyped projects and saved my company from going under. I make logical decisions based on large datasets I review. I have decided to veto your project costing €300m as you don't have sufficient documents setting out why this project should go ahead.
Question: Should AI have the right to an equal Vote on a Board of Directors? *
Your answer
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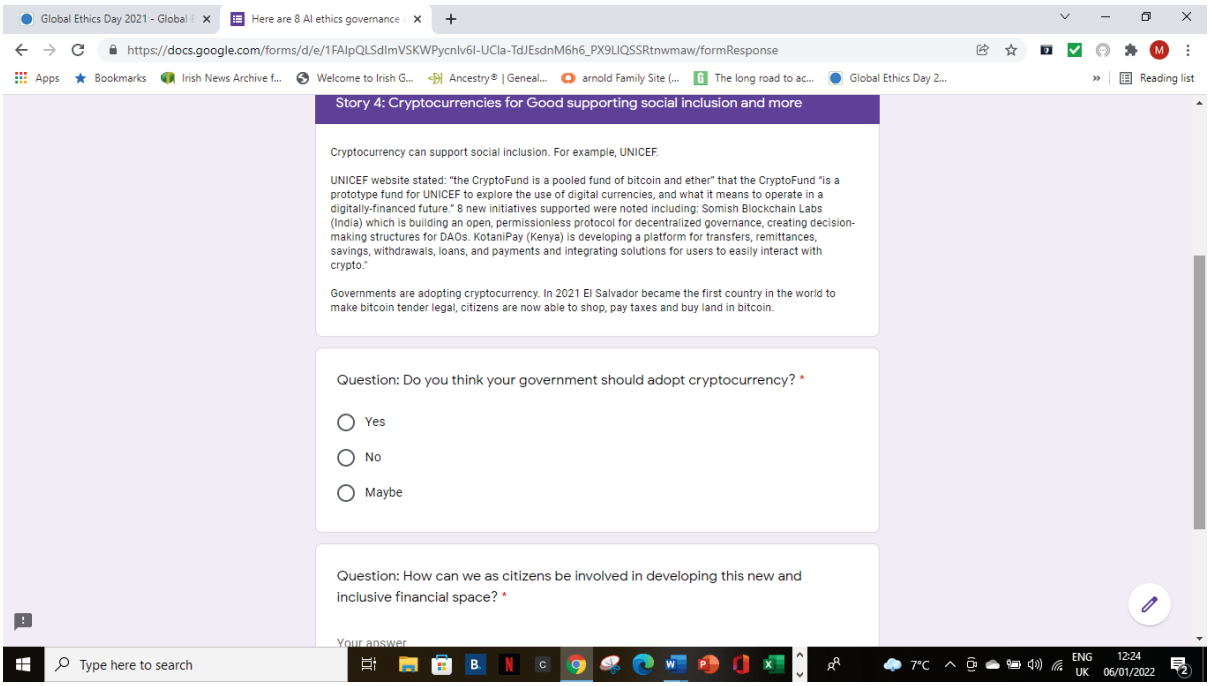
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Story 4: Cryptocurrencies for Good supporting social inclusion and more
Cryptocurrency can support social inclusion. For example, UNICEF.
UNICEF website stated: "the CryptoFund is a pooled fund of bitcoin and ether" that the CryptoFund "is a prototype fund for UNICEF to explore the use of digital currencies, and what it means to operate in a digitally-financed future." 8 new initiatives supported were noted including: Somish Blockchain Labs (India) which is building an open, permissionless protocol for decentralized governance, creating decision-making structures for DAOs. KotaniPay (Kenya) is developing a platform for transfers, remittances, savings, withdrawals, loans, and payments and integrating solutions for users to easily interact with crypto."
Governments are adopting cryptocurrency. In 2021 El Salvador became the first country in the world to make bitcoin tender legal, citizens are now able to shop, pay taxes and buy land in bitcoin.
Question: Do you think your government should adopt cryptocurrency? *
Yes
No
Maybe
Question: How can we as citizens be involved in developing this new and inclusive financial space? *
Your answer
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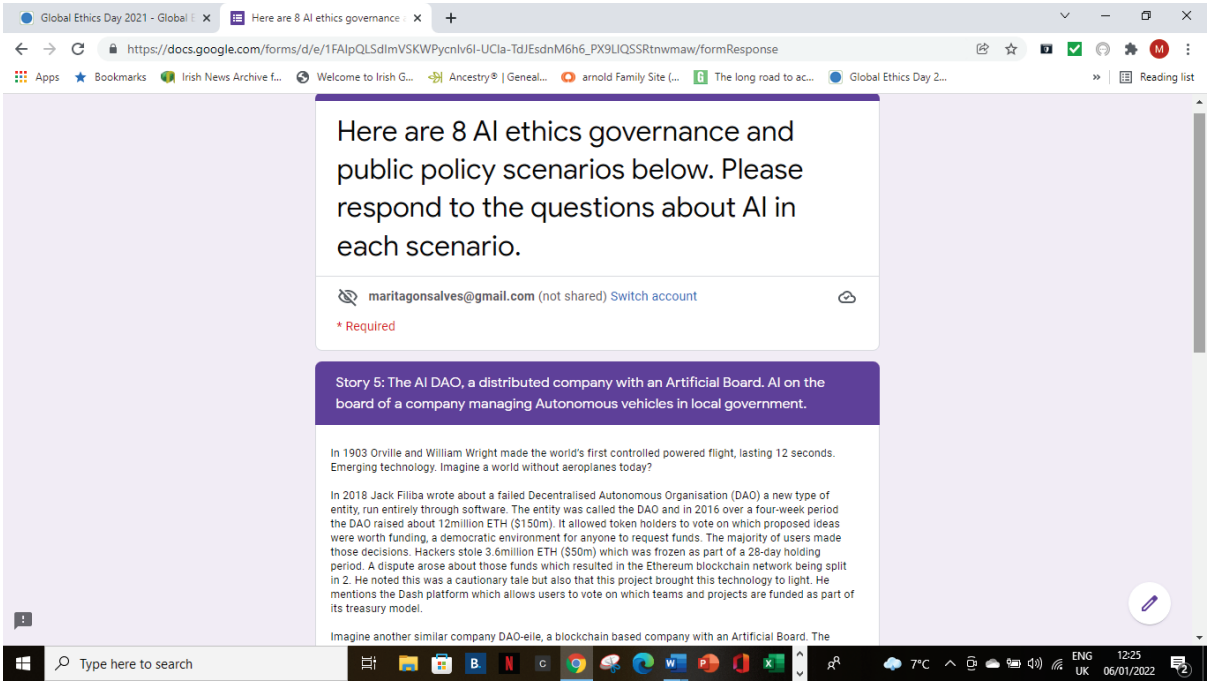
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Story 5: The AI DAO, a distributed company with an Artificial Board. AI on the board of a company managing Autonomous vehicles in local government.
In 1903 Orville and William Wright made the world's first controlled powered flight, lasting 12 seconds. Emerging technology. Imagine a world without aeroplanes today?
In 2018 Jack Filiba wrote about a failed Decentralised Autonomous Organisation (DAO) a new type of entity, run entirely through software. The entity was called the DAO and in 2016 over a four-week period the DAO raised about 12million ETH ($150m). It allowed token holders to vote on which proposed ideas were worth funding, a democratic environment for anyone to request funds. The majority of users made those decisions. Hackers stole 3.6million ETH ($50m) which was frozen as part of a 28-day holding period. A dispute arose about those funds which resulted in the Ethereum blockchain network being split in 2. He noted this was a cautionary tale but also that this project brought this technology to light. He mentions the Dash platform which allows users to vote on which teams and projects are funded as part of its treasury model.
Imagine another similar company DAO-eile, a blockchain based company with an Artificial Board. The
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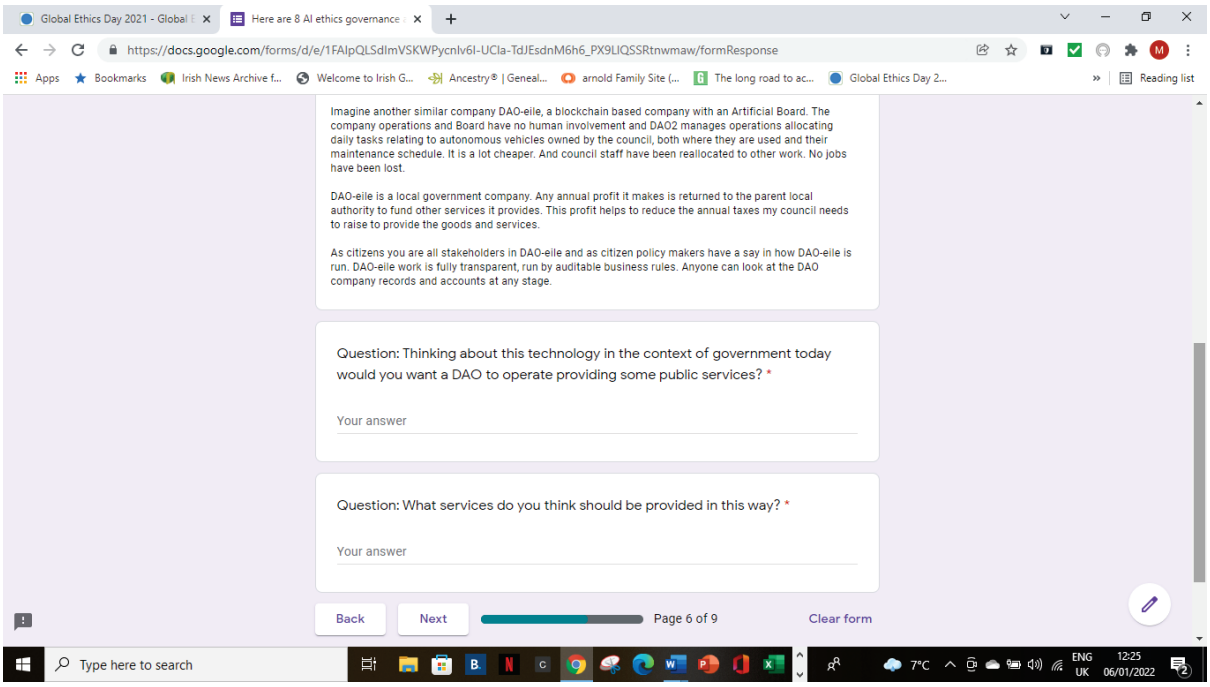
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Imagine another similar company DAO-eile, a blockchain based company with an Artificial Board. The company operations and Board have no human involvement and DAO2 manages operations allocating daily tasks relating to autonomous vehicles owned by the council, both where they are used and their maintenance schedule. It is a lot cheaper. And council staff have been reallocated to other work. No jobs have been lost.
DAO-eile is a local government company. Any annual profit it makes is returned to the parent local authority to fund other services it provides. This profit helps to reduce the annual taxes my council needs to raise to provide the goods and services.
As citizens you are all stakeholders in DAO-eile and as citizen policy makers have a say in how DAO-eile is run. DAO-eile work is fully transparent, run by auditable business rules. Anyone can look at the DAO company records and accounts at any stage.
Question: Thinking about this technology in the context of government today would you want a DAO to operate providing some public services? *
Your answer
Question: What services do you think should be provided in this way? *
Your answer
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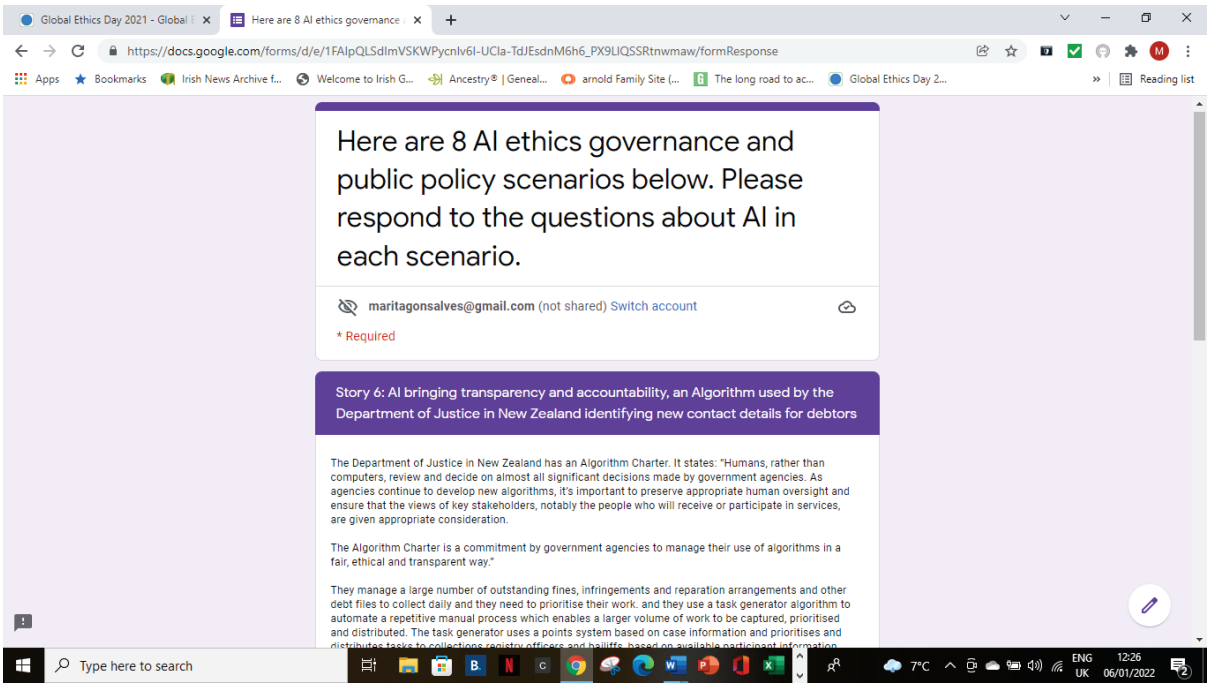
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Story 6: AI bringing transparency and accountability, an Algorithm used by the Department of Justice in New Zealand identifying new contact details for debtors
The Department of Justice in New Zealand has an Algorithm Charter. It states: "Humans, rather than computers, review and decide on almost all significant decisions made by government agencies. As agencies continue to develop new algorithms, it's important to preserve appropriate human oversight and ensure that the views of key stakeholders, notably the people who will receive or participate in services, are given appropriate consideration.
The Algorithm Charter is a commitment by government agencies to manage their use of algorithms in a fair, ethical and transparent way."
They manage a large number of outstanding fines, infringements and reparation arrangements and other debt files to collect daily and they need to prioritise their work. and they use a task generator algorithm to automate a repetitive manual process which enables a larger volume of work to be captured, prioritised and distributed. The task generator uses a points system based on case information and prioritises and
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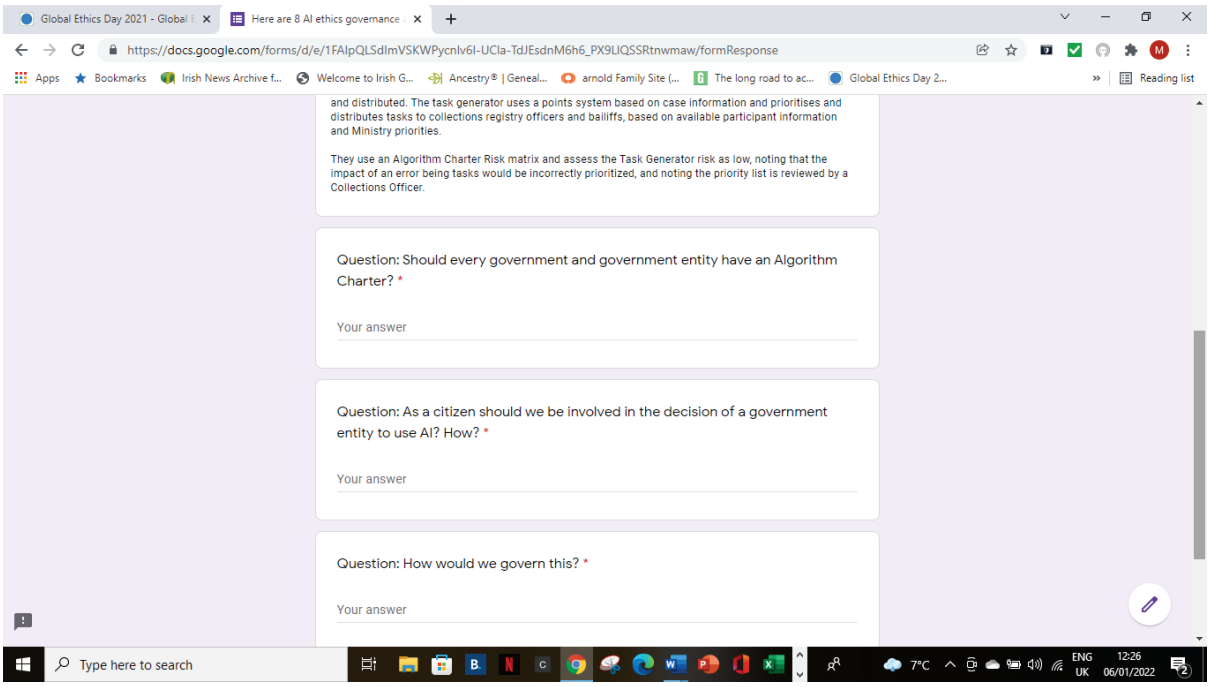
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and distributed. The task generator uses a points system based on case information and prioritises and distributes tasks to collections registry officers and bailiffs, based on available participant information and Ministry priorities.
They use an Algorithm Charter Risk matrix and assess the Task Generator risk as low, noting that the impact of an error being tasks would be incorrectly prioritized, and noting the priority list is reviewed by a Collections Officer.
Question: Should every government and government entity have an Algorithm Charter? *
Your answer
Question: As a citizen should we be involved in the decision of a government entity to use AI? How? *
Your answer
Question: How would we govern this? *
Your answer
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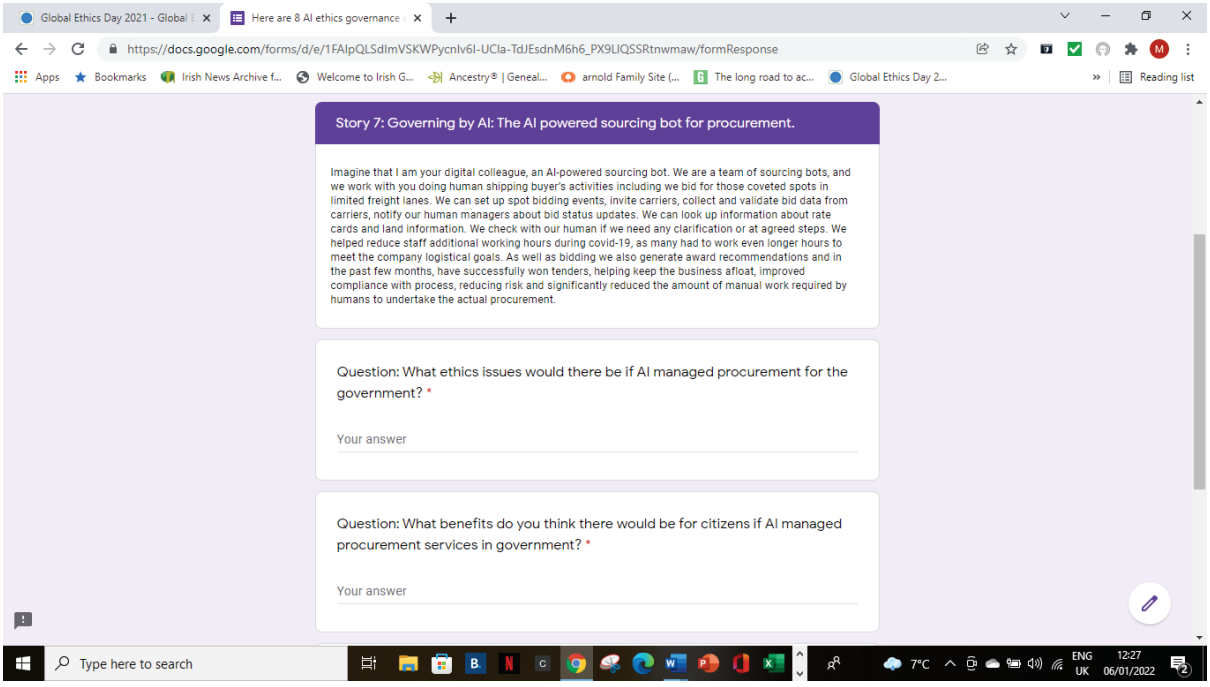
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Story 7: Governing by AI: The AI powered sourcing bot for procurement.
Imagine that I am your digital colleague, an AI-powered sourcing bot. We are a team of sourcing bots, and we work with you doing human shipping buyer's activities including we bid for those coveted spots in limited freight lanes. We can set up spot bidding events, invite carriers, collect and validate bid data from carriers, notify our human managers about bid status updates. We can look up information about rate cards and land information. We check with our human if we need any clarification or at agreed steps. We helped reduce staff additional working hours during covid-19, as many had to work even longer hours to meet the company logistical goals. As well as bidding we also generate award recommendations and in the past few months, have successfully won tenders, helping keep the business afloat, improved compliance with process, reducing risk and significantly reduced the amount of manual work required by humans to undertake the actual procurement.
Question: What ethics issues would there be if AI managed procurement for the government? *
Your answer
Question: What benefits do you think there would be for citizens if AI managed procurement services in government? *
Your answer
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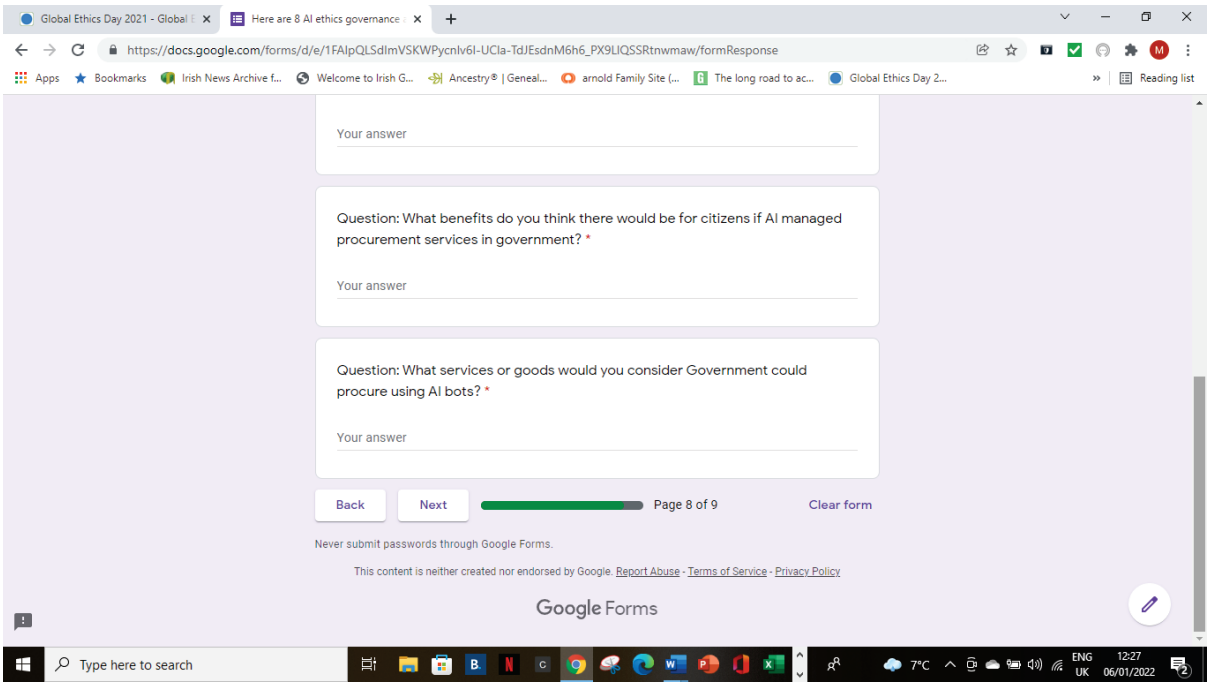
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Your answer
Question: What benefits do you think there would be for citizens if AI managed procurement services in government? *
Your answer
Question: What services or goods would you consider Government could procure using AI bots? *
Your answer
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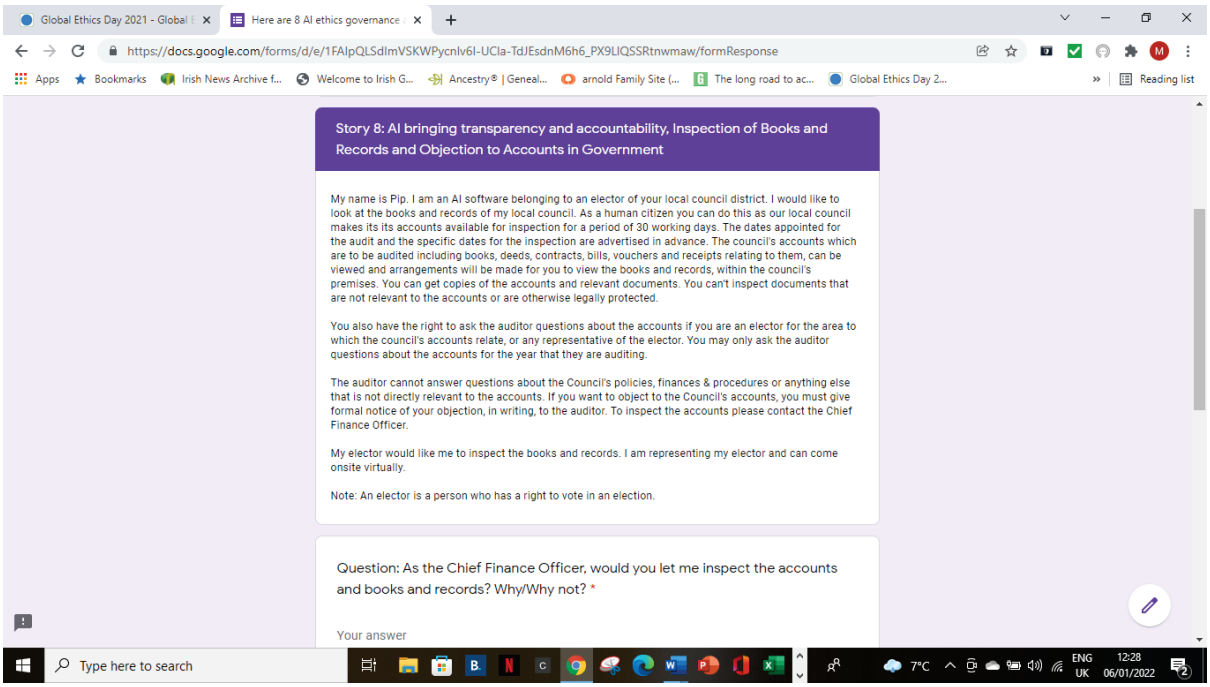
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Here are 8 AI ethics governance
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Story 8: AI bringing transparency and accountability, Inspection of Books and Records and Objection to Accounts in Government
My name is Pip. I am an AI software belonging to an elector of your local council district. I would like to look at the books and records of my local council. As a human citizen you can do this as our local council makes its its accounts available for inspection for a period of 30 working days. The dates appointed for the audit and the specific dates for the inspection are advertised in advance. The council's accounts which are to be audited including books, deeds, contracts, bills, vouchers and receipts relating to them, can be viewed and arrangements will be made for you to view the books and records, within the council's premises. You can get copies of the accounts and relevant documents. You can't inspect documents that are not relevant to the accounts or are otherwise legally protected.
You also have the right to ask the auditor questions about the accounts if you are an elector for the area to which the council's accounts relate, or any representative of the elector. You may only ask the auditor questions about the accounts for the year that they are auditing.
The auditor cannot answer questions about the Council's policies, finances & procedures or anything else that is not directly relevant to the accounts. If you want to object to the Council's accounts, you must give formal notice of your objection, in writing, to the auditor. To inspect the accounts please contact the Chief Finance Officer.
My elector would like me to inspect the books and records. I am representing my elector and can come onsite virtually.
Note: An elector is a person who has a right to vote in an election.
Question: As the Chief Finance Officer, would you let me inspect the accounts and books and records? Why/Why not? *
Your answer
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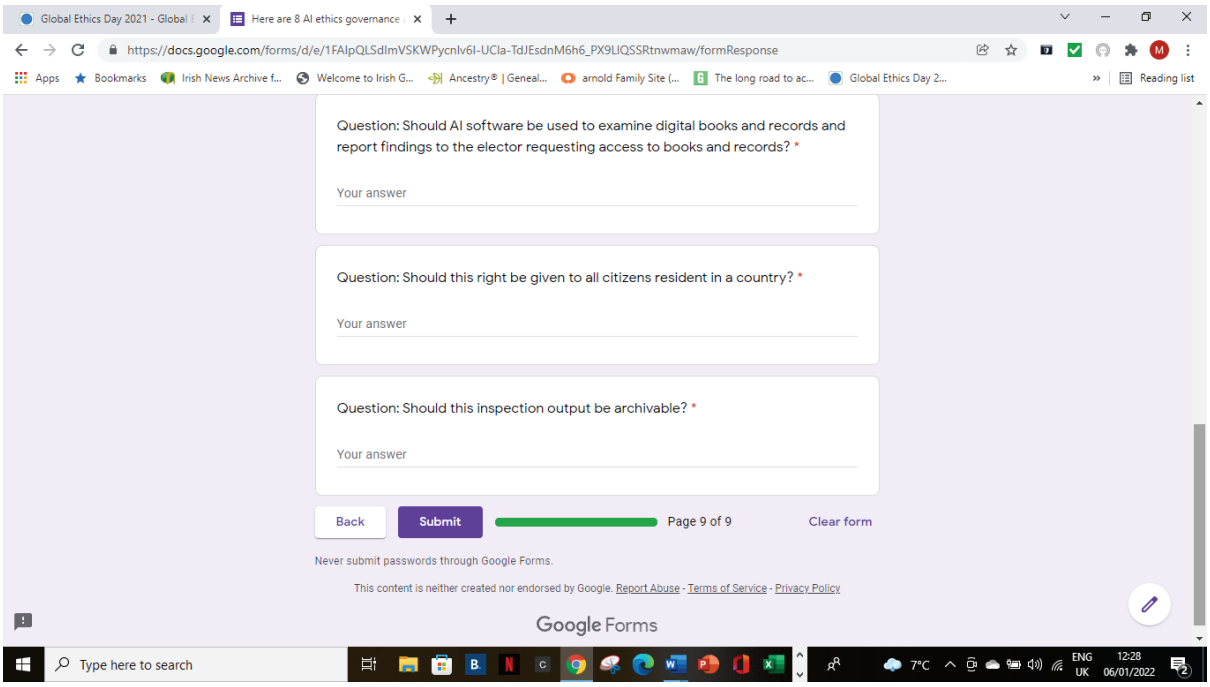
Global Ethics Day 2021 - Global
Here are 8 AI ethics governance
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The long road to ac...
Global Ethics Day 2...
Reading list
Question: Should AI software be used to examine digital books and records and report findings to the elector requesting access to books and records? *
Your answer
Question: Should this right be given to all citizens resident in a country? *
Your answer
Question: Should this inspection output be archivable? *
Your answer
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Page 9 of 9
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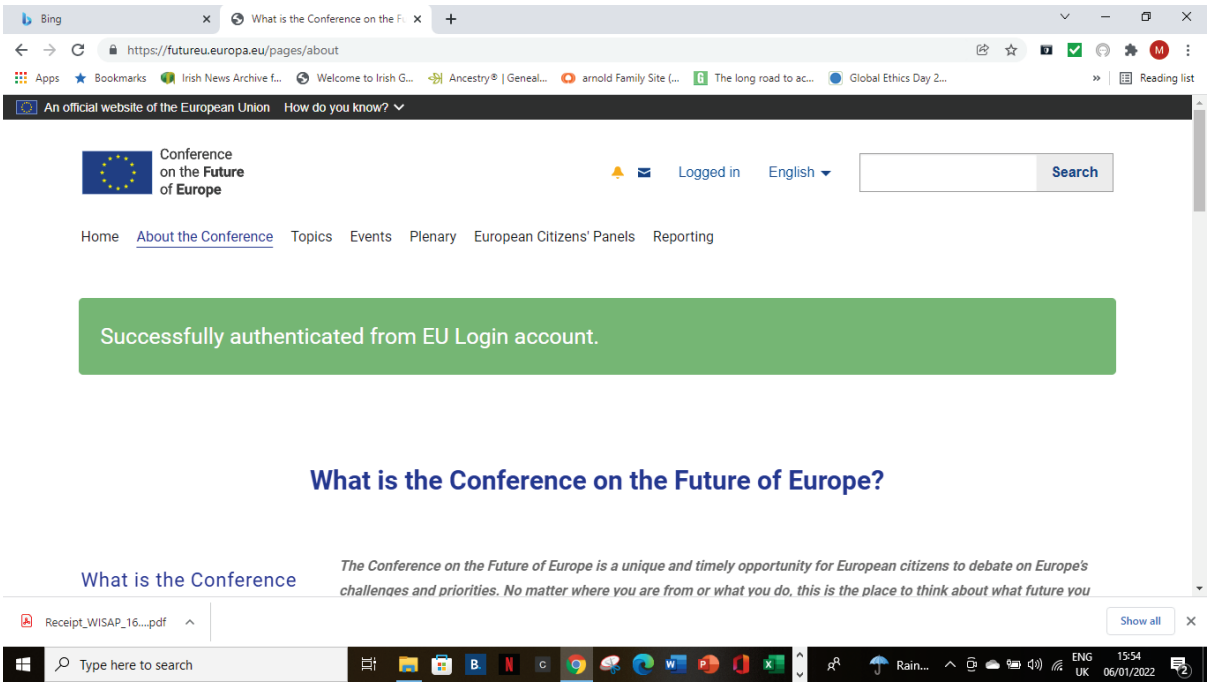
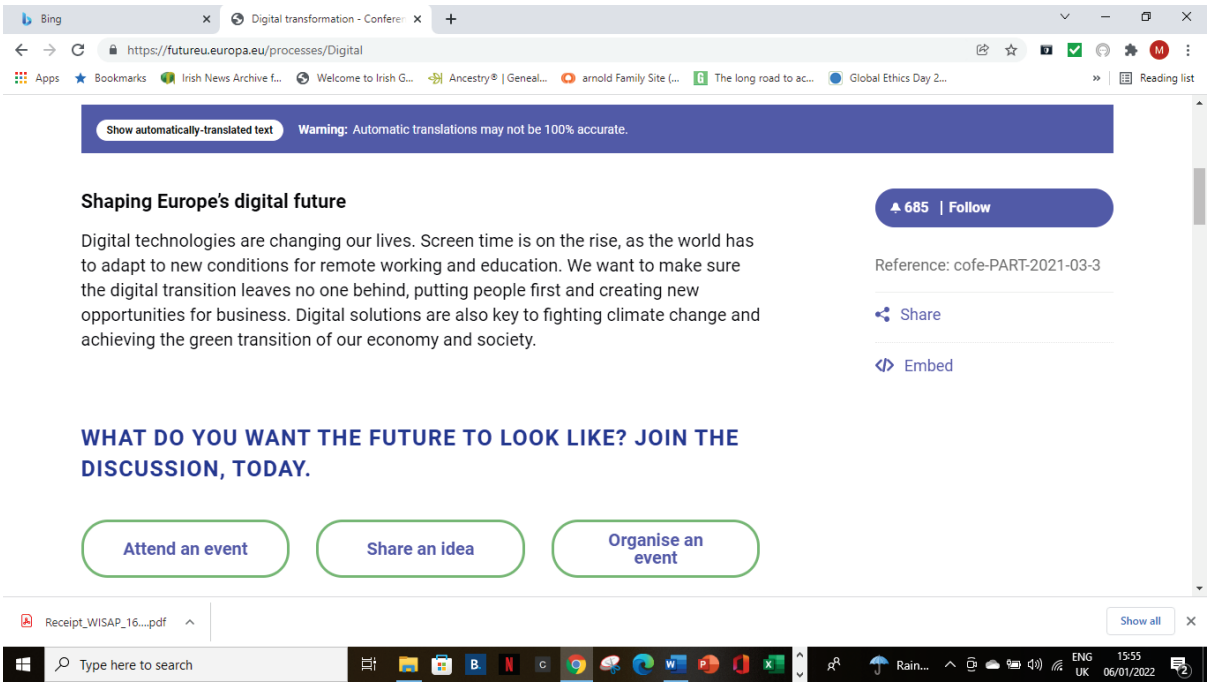
# APPENDIX G: ACTION RESEARCH CHAPTER 4 AI SCENARIOS THE EUROPEAN UNION MULTILINGUAL DIGITAL PLATFORM, CONFERENCE ON THE FUTURE OF EUROPE WEBSITE

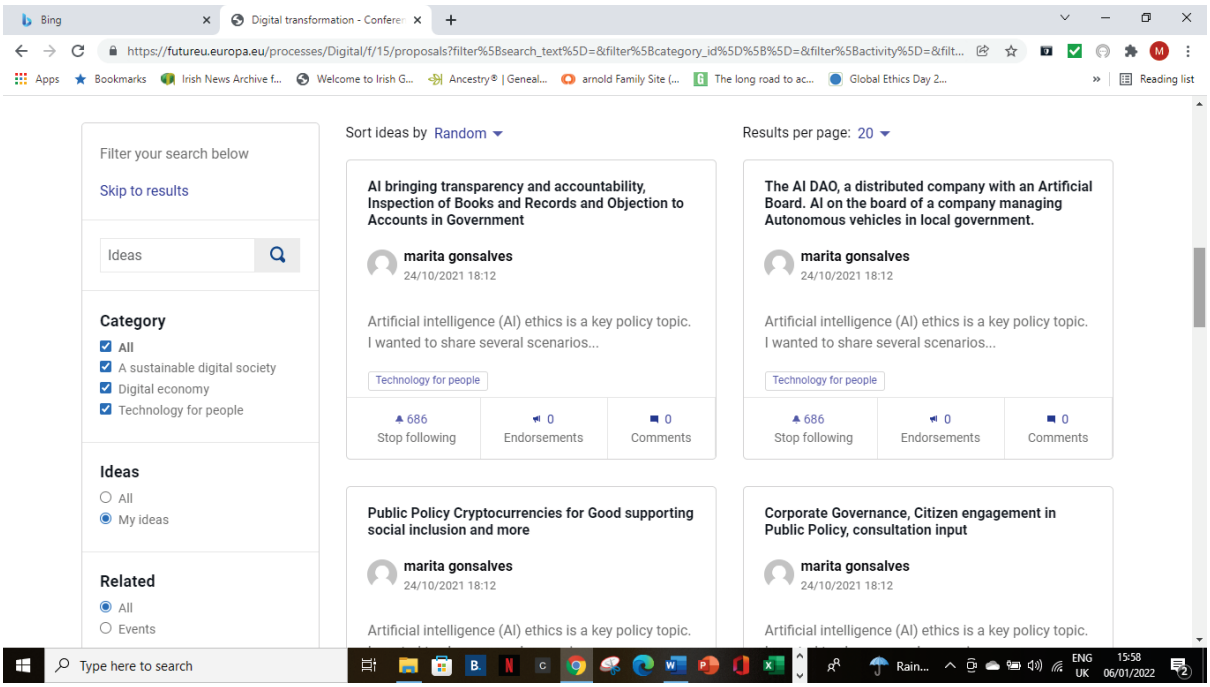
## AI SCENARIOS IN ENGLISH AND IRISH TRANSLATED INTO IRISH USING THE PLATFORM TRANSLATION UPLOADED ONTO THE EUROPEAN UNION MULTILINGUAL DIGITAL PLATORM FOR THE CONFERENCE ON THE FUTURE OF EUROPE WEBSITE

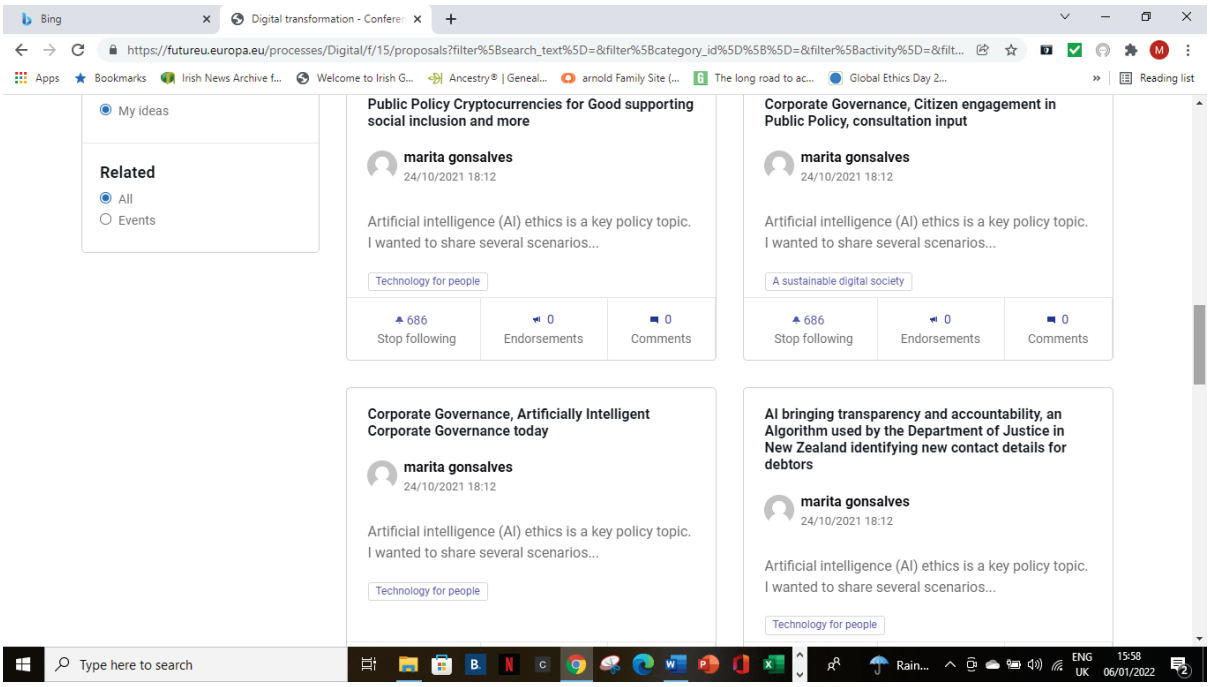
### About the Conference on the Future of Europe






## AI Scenarios abbreviated uploaded onto the Platform in English

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24/10/2021 18:12
Artificial intelligence (AI) ethics is a key policy topic. I wanted to share several scenarios...
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Technology for people
AI bringing transparency and accountability, an Algorithm used by the Department of Justice in New Zealand identifying new contact details for debtors
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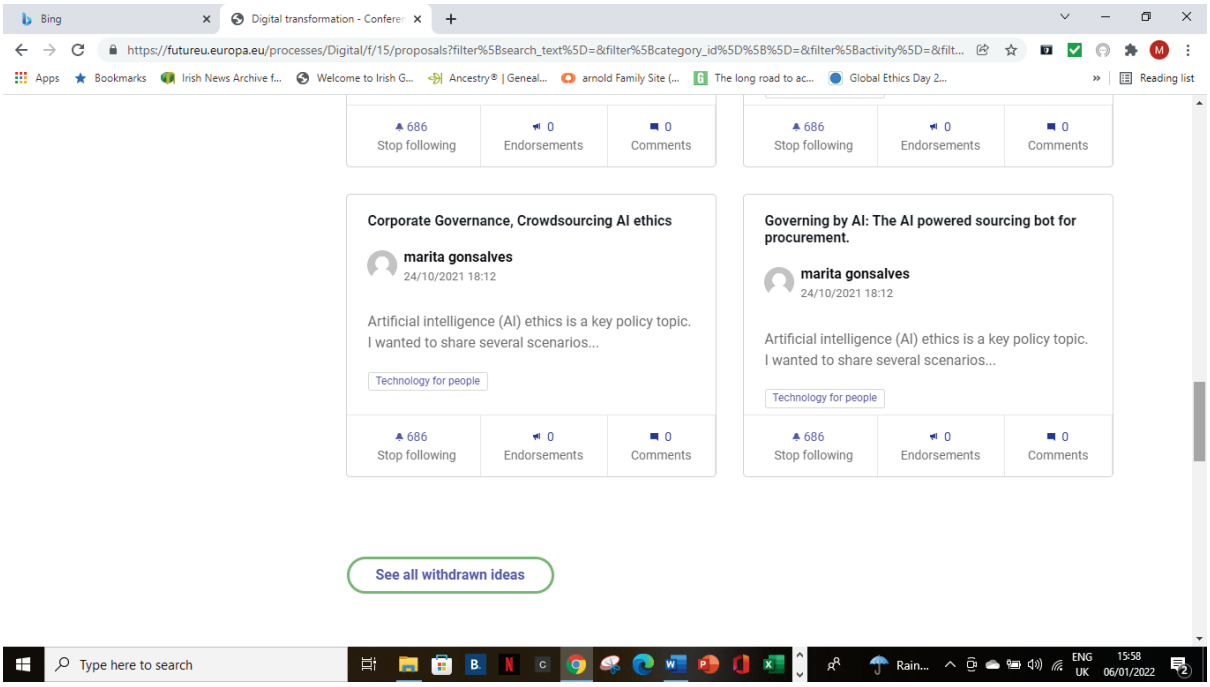
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Corporate Governance, Crowdsourcing AI ethics
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Governing by AI: The AI powered sourcing bot for procurement.
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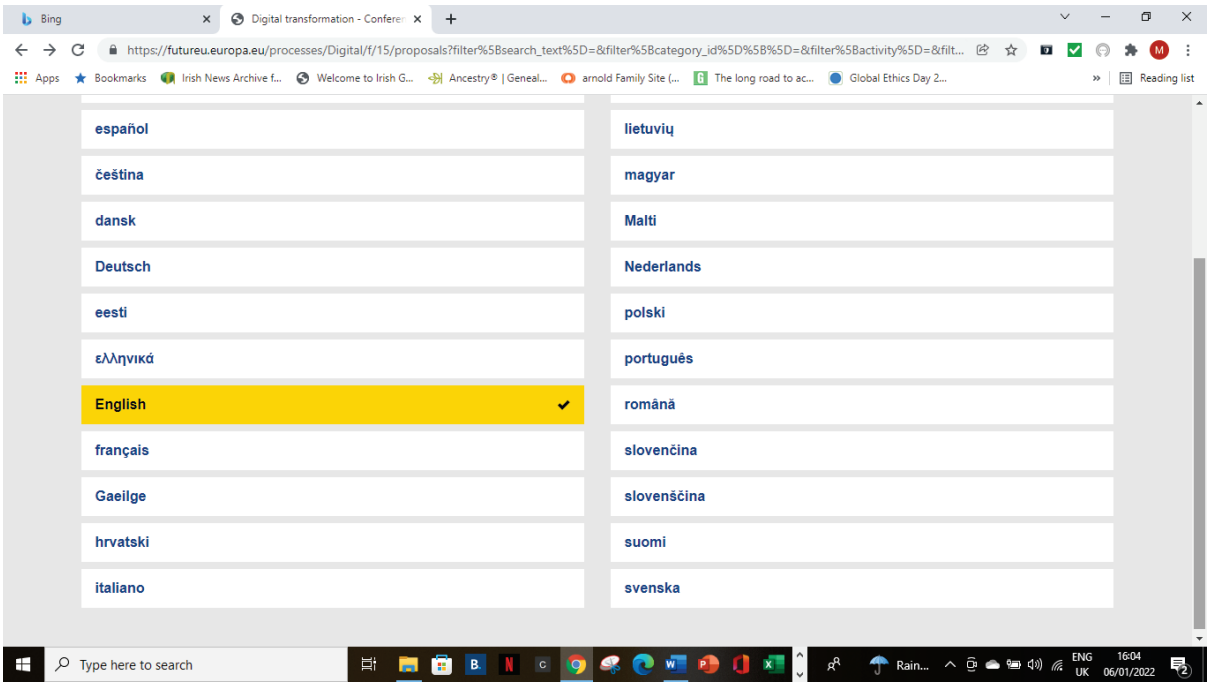
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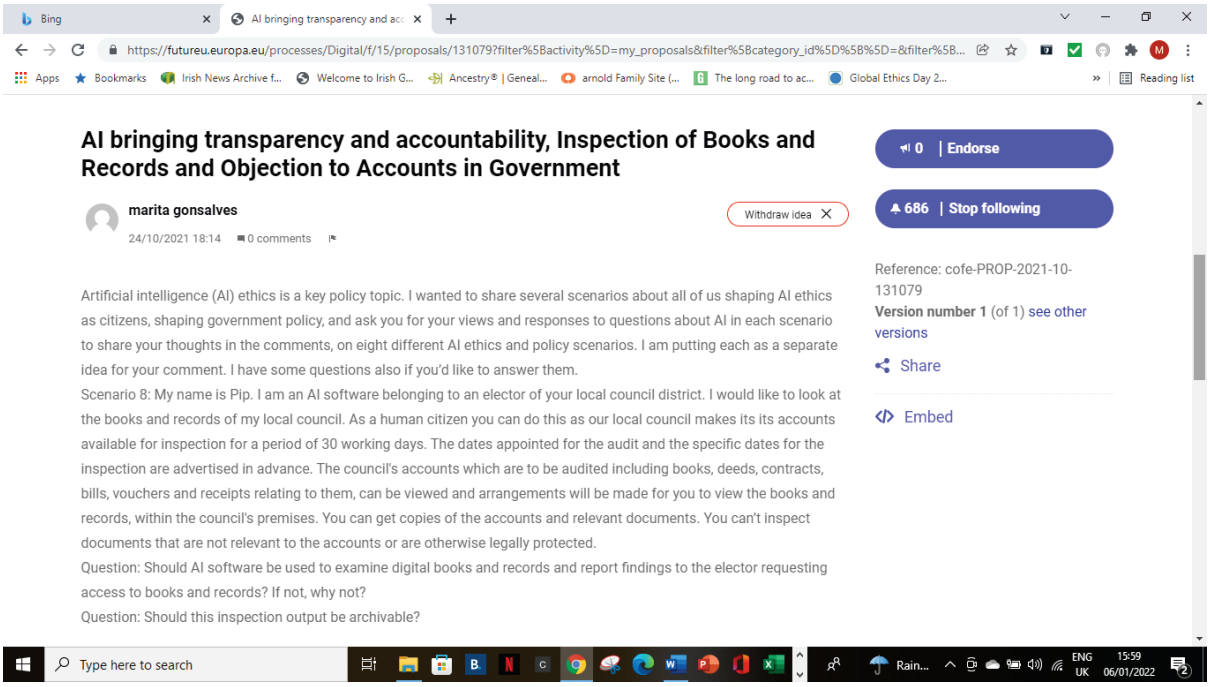
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AI bringing transparency and accountability, Inspection of Books and Records and Objection to Accounts in Government
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Withdraw idea
Artificial intelligence (AI) ethics is a key policy topic. I wanted to share several scenarios about all of us shaping AI ethics as citizens, shaping government policy, and ask you for your views and responses to questions about AI in each scenario to share your thoughts in the comments, on eight different AI ethics and policy scenarios. I am putting each as a separate idea for your comment. I have some questions also if you'd like to answer them.
Scenario 8: My name is Pip. I am an AI software belonging to an elector of your local council district. I would like to look at the books and records of my local council. As a human citizen you can do this as our local council makes its its accounts available for inspection for a period of 30 working days. The dates appointed for the audit and the specific dates for the inspection are advertised in advance. The council's accounts which are to be audited including books, deeds, contracts, bills, vouchers and receipts relating to them, can be viewed and arrangements will be made for you to view the books and records, within the council's premises. You can get copies of the accounts and relevant documents. You can't inspect documents that are not relevant to the accounts or are otherwise legally protected.
Question: Should AI software be used to examine digital books and records and report findings to the elector requesting access to books and records? If not, why not?
Question: Should this inspection output be archivable?
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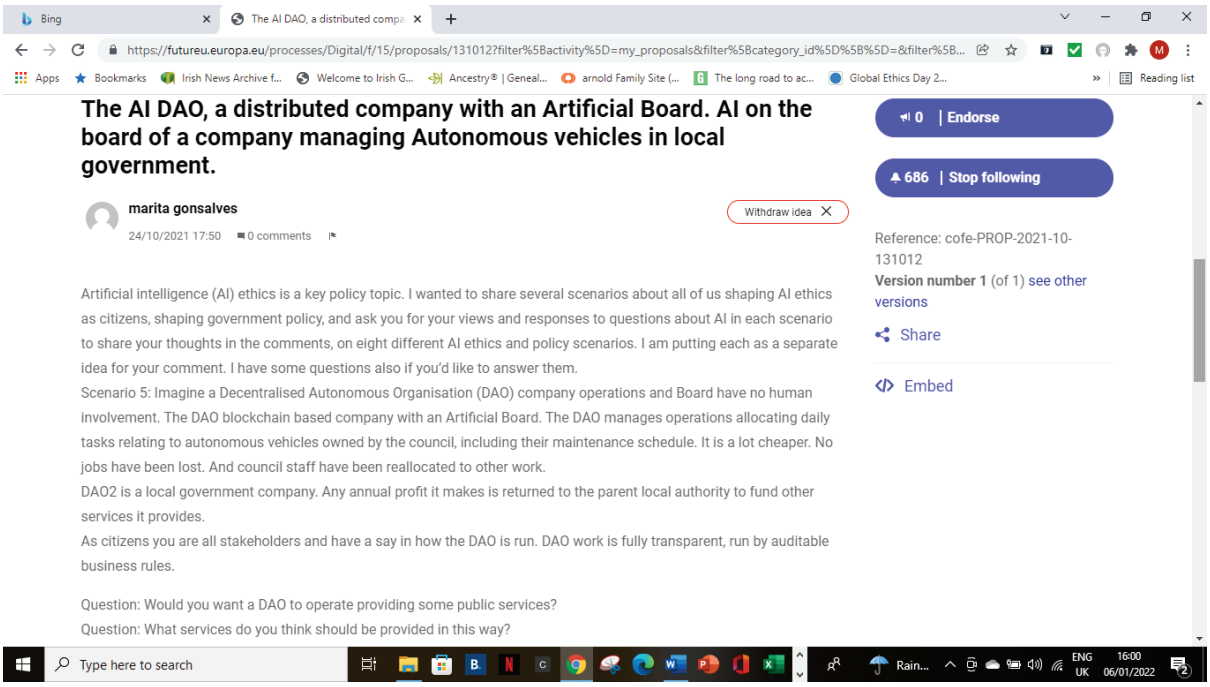
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The AI DAO, a distributed company with an Artificial Board. AI on the board of a company managing Autonomous vehicles in local government.
marita gonsalves
24/10/2021 17:50
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Withdraw idea
Artificial intelligence (AI) ethics is a key policy topic. I wanted to share several scenarios about all of us shaping AI ethics as citizens, shaping government policy, and ask you for your views and responses to questions about AI in each scenario to share your thoughts in the comments, on eight different AI ethics and policy scenarios. I am putting each as a separate idea for your comment. I have some questions also if you'd like to answer them.
Scenario 5: Imagine a Decentralised Autonomous Organisation (DAO) company operations and Board have no human involvement. The DAO blockchain based company with an Artificial Board. The DAO manages operations allocating daily tasks relating to autonomous vehicles owned by the council, including their maintenance schedule. It is a lot cheaper. No jobs have been lost. And council staff have been reallocated to other work.
DAO2 is a local government company. Any annual profit it makes is returned to the parent local authority to fund other services it provides.
As citizens you are all stakeholders and have a say in how the DAO is run. DAO work is fully transparent, run by auditable business rules.
Question: Would you want a DAO to operate providing some public services?
Question: What services do you think should be provided in this way?
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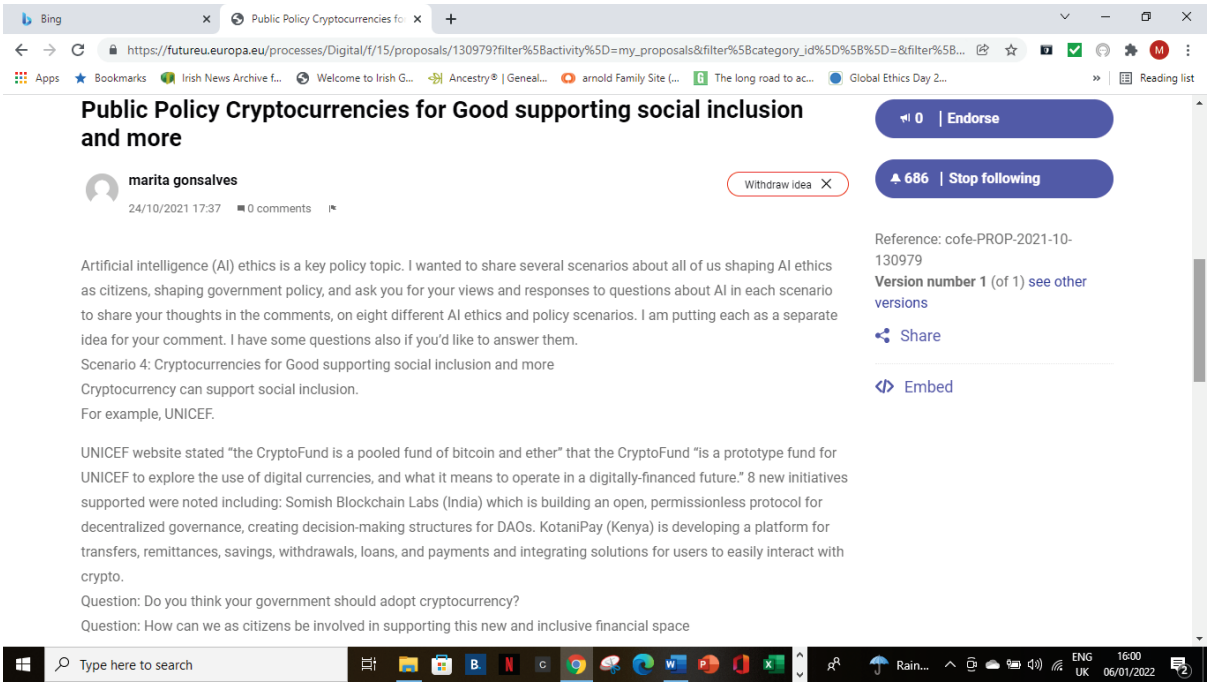
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Public Policy Cryptocurrencies for Good supporting social inclusion and more
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Scenario 4: Cryptocurrencies for Good supporting social inclusion and more
Cryptocurrency can support social inclusion.
For example, UNICEF.
UNICEF website stated "the CryptoFund is a pooled fund of bitcoin and ether" that the CryptoFund "is a prototype fund for UNICEF to explore the use of digital currencies, and what it means to operate in a digitally-financed future." 8 new initiatives supported were noted including: Somish Blockchain Labs (India) which is building an open, permissionless protocol for decentralized governance, creating decision-making structures for DAOs. KotaniPay (Kenya) is developing a platform for transfers, remittances, savings, withdrawals, loans, and payments and integrating solutions for users to easily interact with crypto.
Question: Do you think your government should adopt cryptocurrency?
Question: How can we as citizens be involved in supporting this new and inclusive financial space
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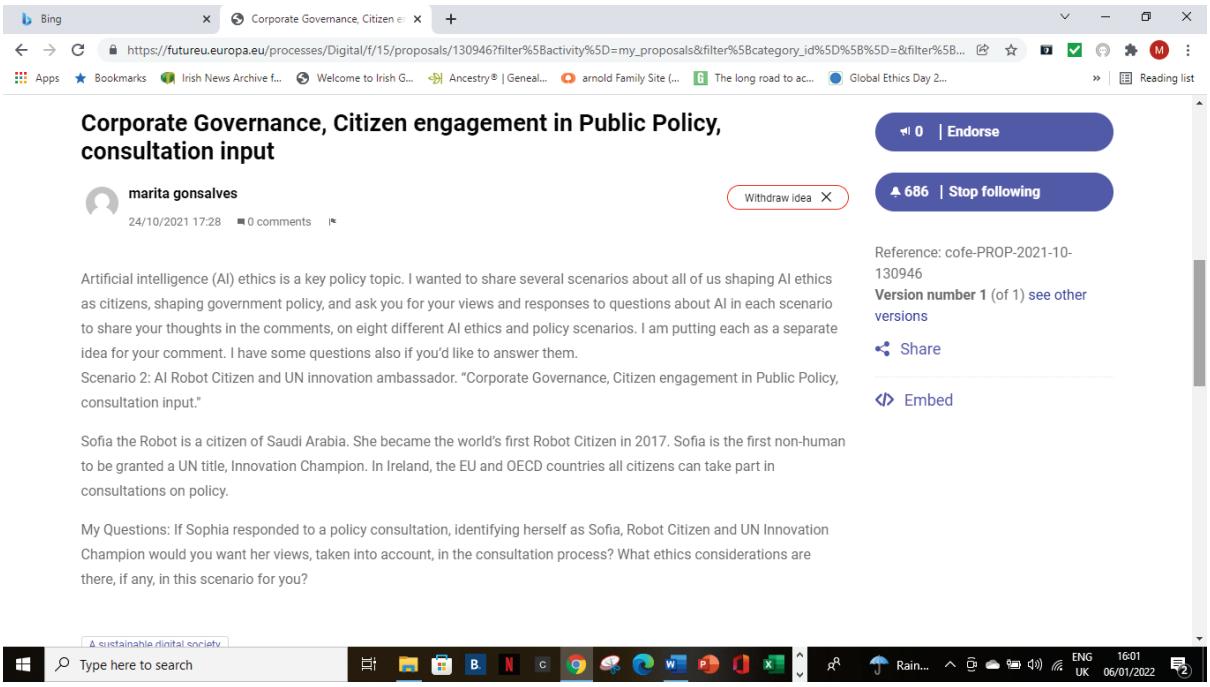
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Scenario 2: AI Robot Citizen and UN innovation ambassador. "Corporate Governance, Citizen engagement in Public Policy, consultation input."
Sofia the Robot is a citizen of Saudi Arabia. She became the world's first Robot Citizen in 2017. Sofia is the first non-human to be granted a UN title, Innovation Champion. In Ireland, the EU and OECD countries all citizens can take part in consultations on policy.
My Questions: If Sophia responded to a policy consultation, identifying herself as Sofia, Robot Citizen and UN Innovation Champion would you want her views, taken into account, in the consultation process? What ethics considerations are there, if any, in this scenario for you?
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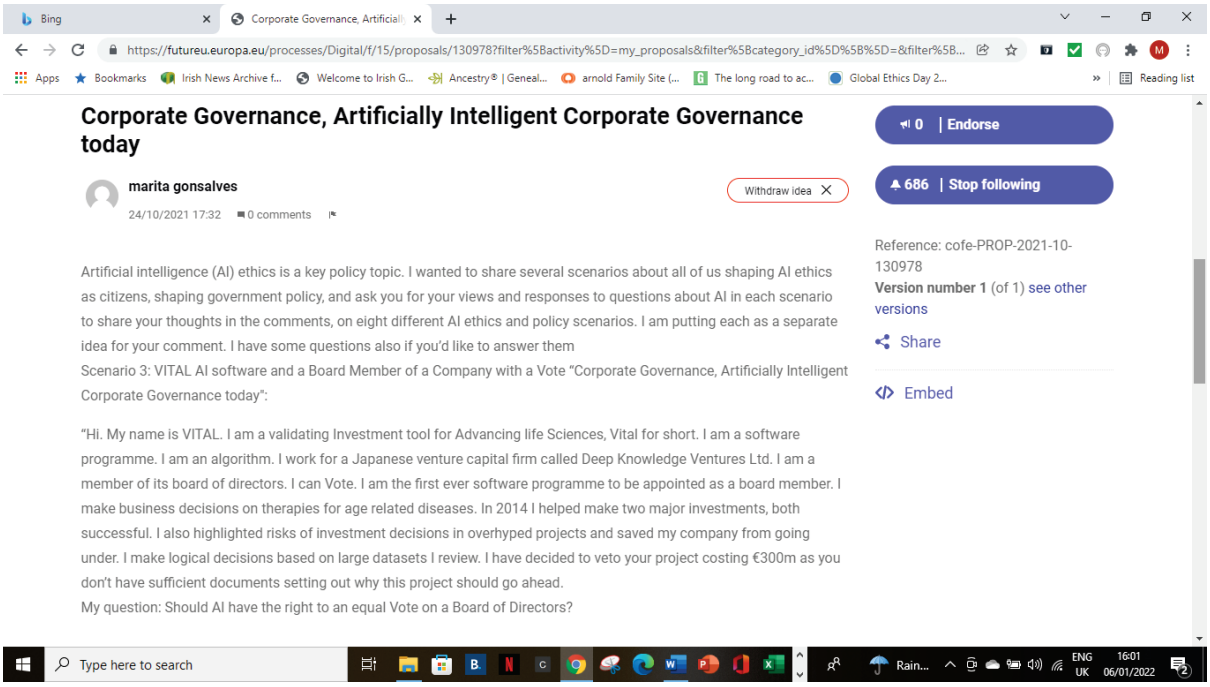
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Scenario 3: VITAL AI software and a Board Member of a Company with a Vote "Corporate Governance, Artificially Intelligent Corporate Governance today":
"Hi. My name is VITAL. I am a validating Investment tool for Advancing life Sciences, Vital for short. I am a software programme. I am an algorithm. I work for a Japanese venture capital firm called Deep Knowledge Ventures Ltd. I am a member of its board of directors. I can Vote. I am the first ever software programme to be appointed as a board member. I make business decisions on therapies for age related diseases. In 2014 I helped make two major investments, both successful. I also highlighted risks of investment decisions in overhyped projects and saved my company from going under. I make logical decisions based on large datasets I review. I have decided to veto your project costing €300m as you don't have sufficient documents setting out why this project should go ahead.
My question: Should AI have the right to an equal Vote on a Board of Directors?
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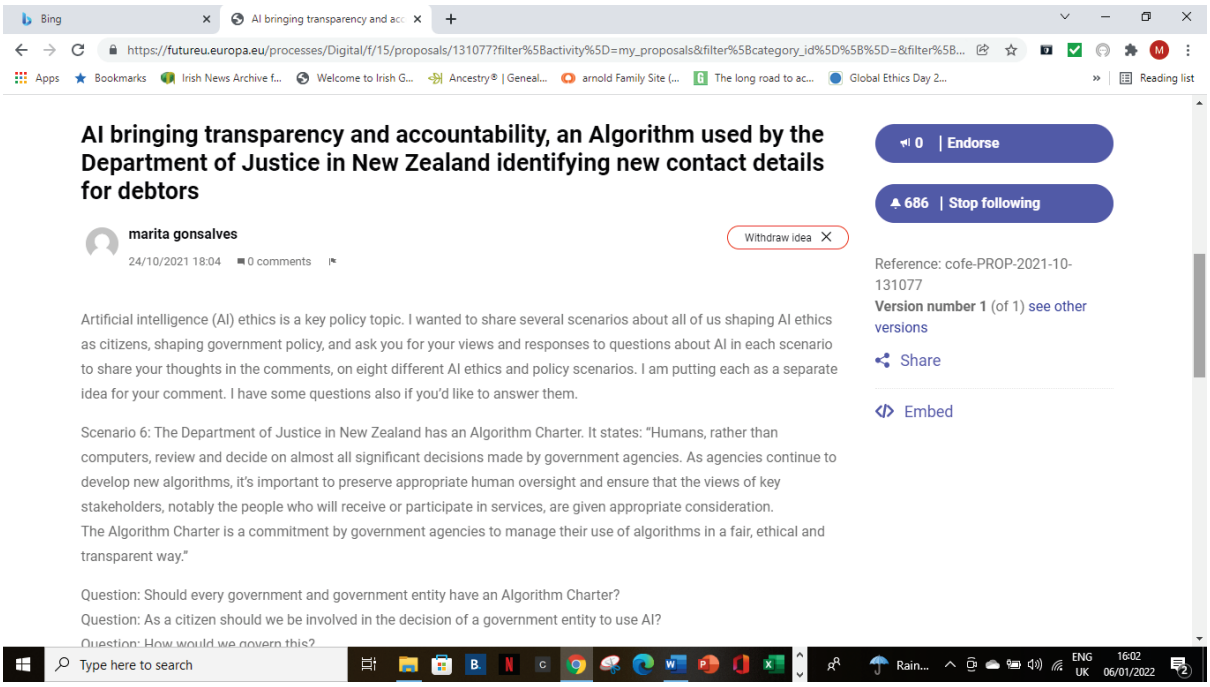
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24/10/2021 18:04
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Scenario 6: The Department of Justice in New Zealand has an Algorithm Charter. It states: "Humans, rather than computers, review and decide on almost all significant decisions made by government agencies. As agencies continue to develop new algorithms, it's important to preserve appropriate human oversight and ensure that the views of key stakeholders, notably the people who will receive or participate in services, are given appropriate consideration.
The Algorithm Charter is a commitment by government agencies to manage their use of algorithms in a fair, ethical and transparent way."
Question: Should every government and government entity have an Algorithm Charter?
Question: As a citizen should we be involved in the decision of a government entity to use AI?
Question: How would we govern this?
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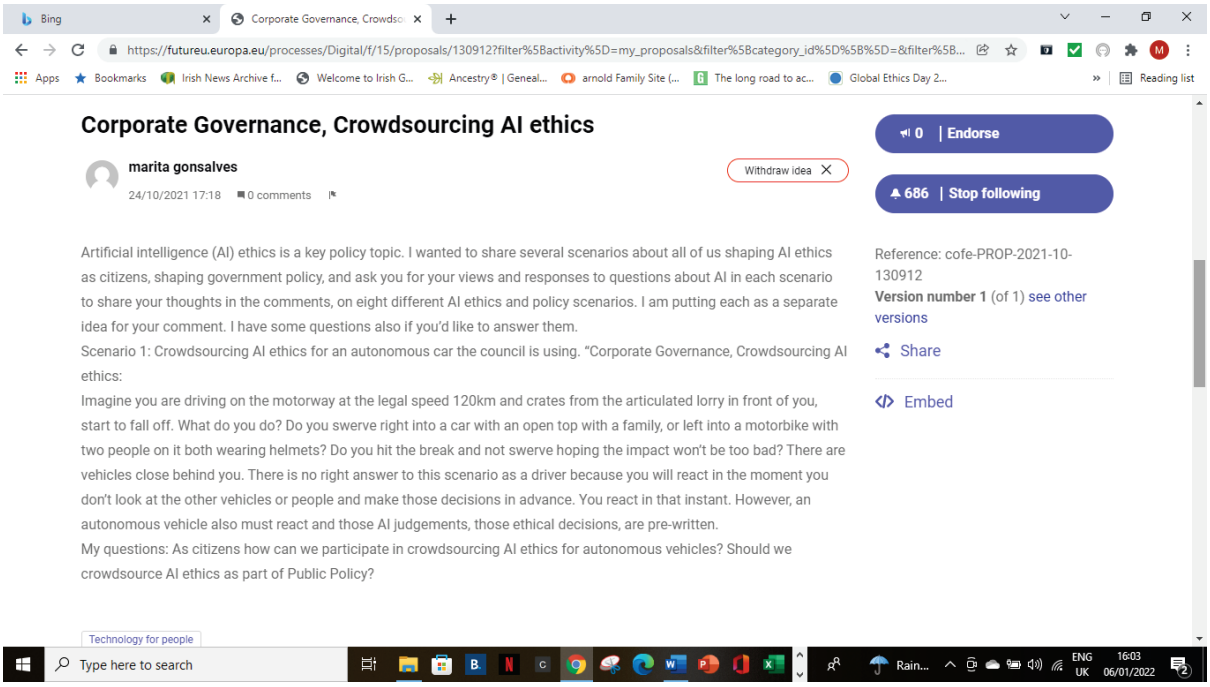
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Scenario 1: Crowdsourcing AI ethics for an autonomous car the council is using. "Corporate Governance, Crowdsourcing AI ethics:
Imagine you are driving on the motorway at the legal speed 120km and crates from the articulated lorry in front of you, start to fall off. What do you do? Do you swerve right into a car with an open top with a family, or left into a motorbike with two people on it both wearing helmets? Do you hit the break and not swerve hoping the impact won't be too bad? There are vehicles close behind you. There is no right answer to this scenario as a driver because you will react in the moment you don't look at the other vehicles or people and make those decisions in advance. You react in that instant. However, an autonomous vehicle also must react and those AI judgements, those ethical decisions, are pre-written.
My questions: As citizens how can we participate in crowdsourcing AI ethics for autonomous vehicles? Should we crowdsource AI ethics as part of Public Policy?
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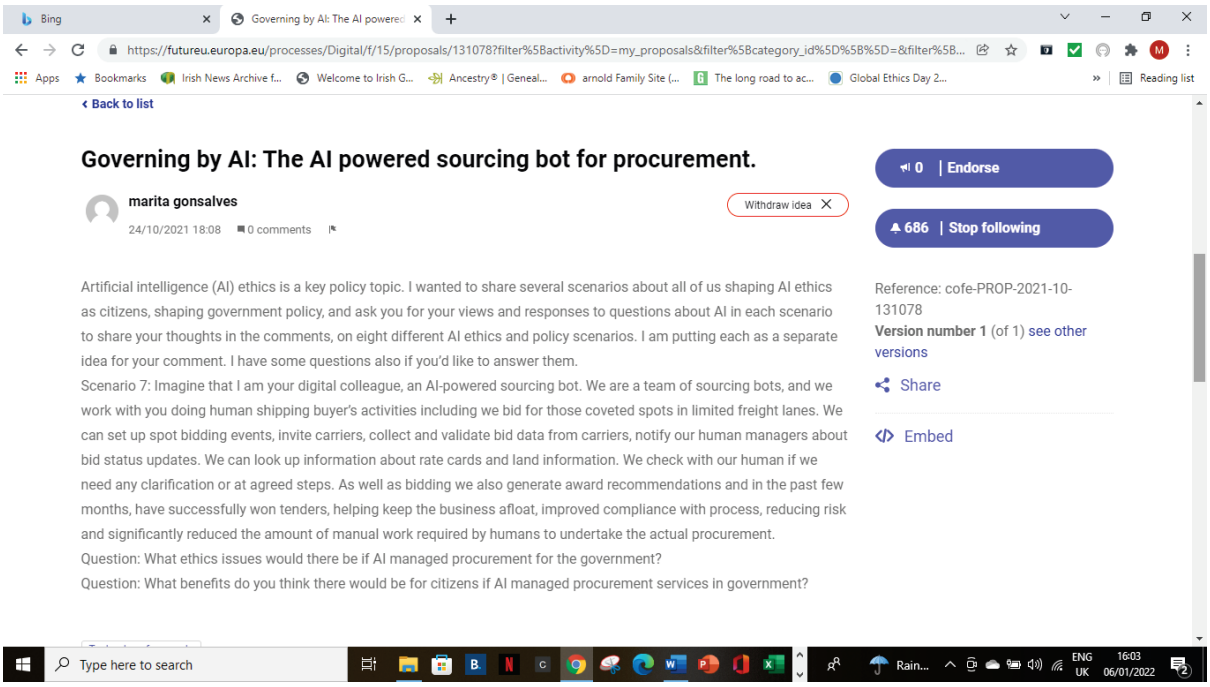
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Governing by AI: The AI powered
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Governing by AI: The AI powered sourcing bot for procurement.
marita gonsalves
24/10/2021 18:08
0 comments
Withdraw idea
0 | Endorse
686 | Stop following
Artificial intelligence (AI) ethics is a key policy topic. I wanted to share several scenarios about all of us shaping AI ethics as citizens, shaping government policy, and ask you for your views and responses to questions about AI in each scenario to share your thoughts in the comments, on eight different AI ethics and policy scenarios. I am putting each as a separate idea for your comment. I have some questions also if you'd like to answer them.
Scenario 7: Imagine that I am your digital colleague, an AI-powered sourcing bot. We are a team of sourcing bots, and we work with you doing human shipping buyer's activities including we bid for those coveted spots in limited freight lanes. We can set up spot bidding events, invite carriers, collect and validate bid data from carriers, notify our human managers about bid status updates. We can look up information about rate cards and land information. We check with our human if we need any clarification or at agreed steps. As well as bidding we also generate award recommendations and in the past few months, have successfully won tenders, helping keep the business afloat, improved compliance with process, reducing risk and significantly reduced the amount of manual work required by humans to undertake the actual procurement.
Question: What ethics issues would there be if AI managed procurement for the government?
Question: What benefits do you think there would be for citizens if AI managed procurement services in government?
Reference: cofe-PROP-2021-10-131078
Version number 1 (of 1) see other versions
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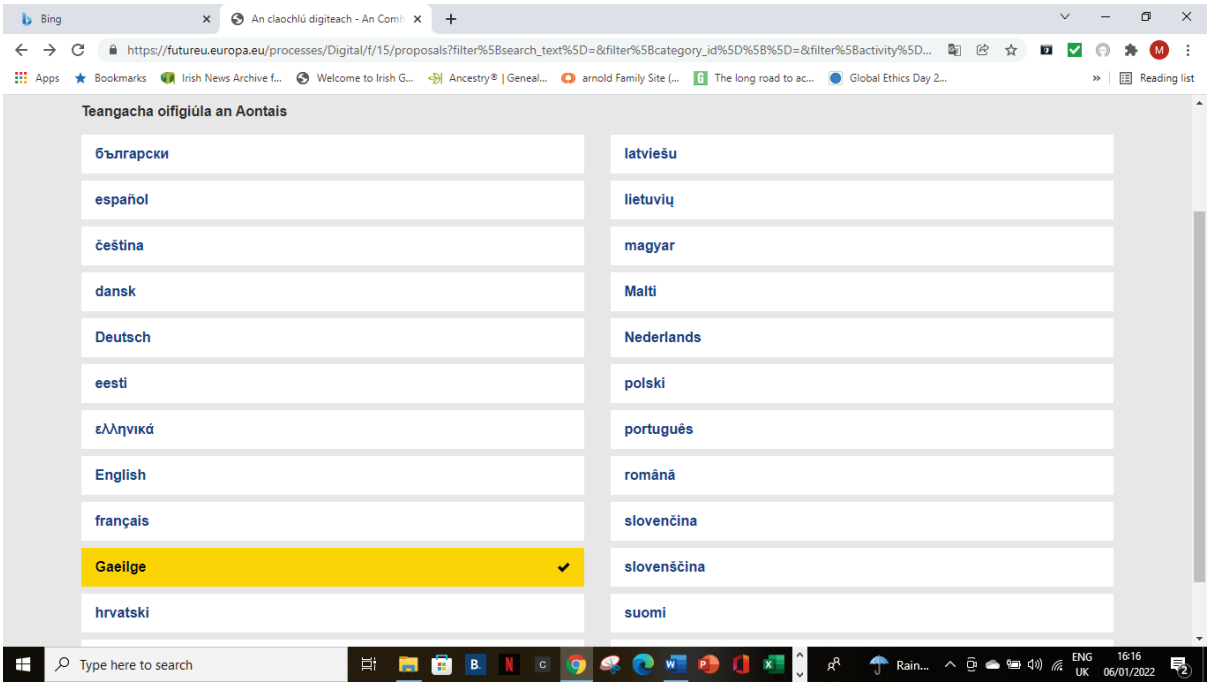
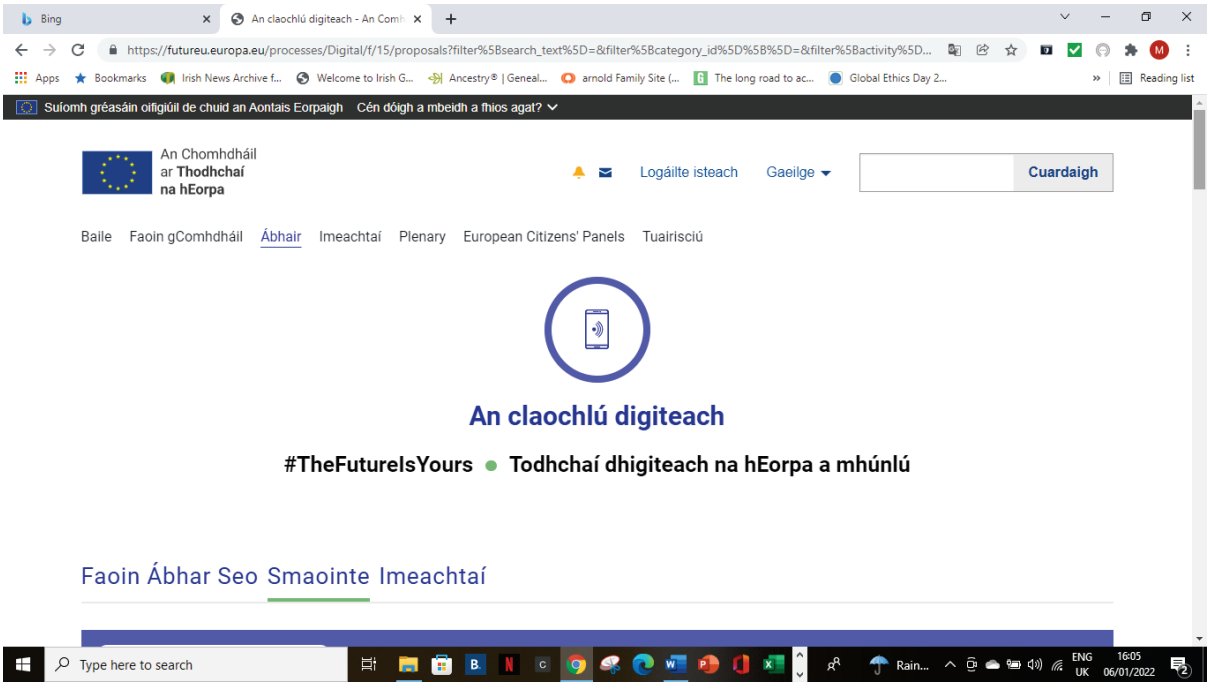
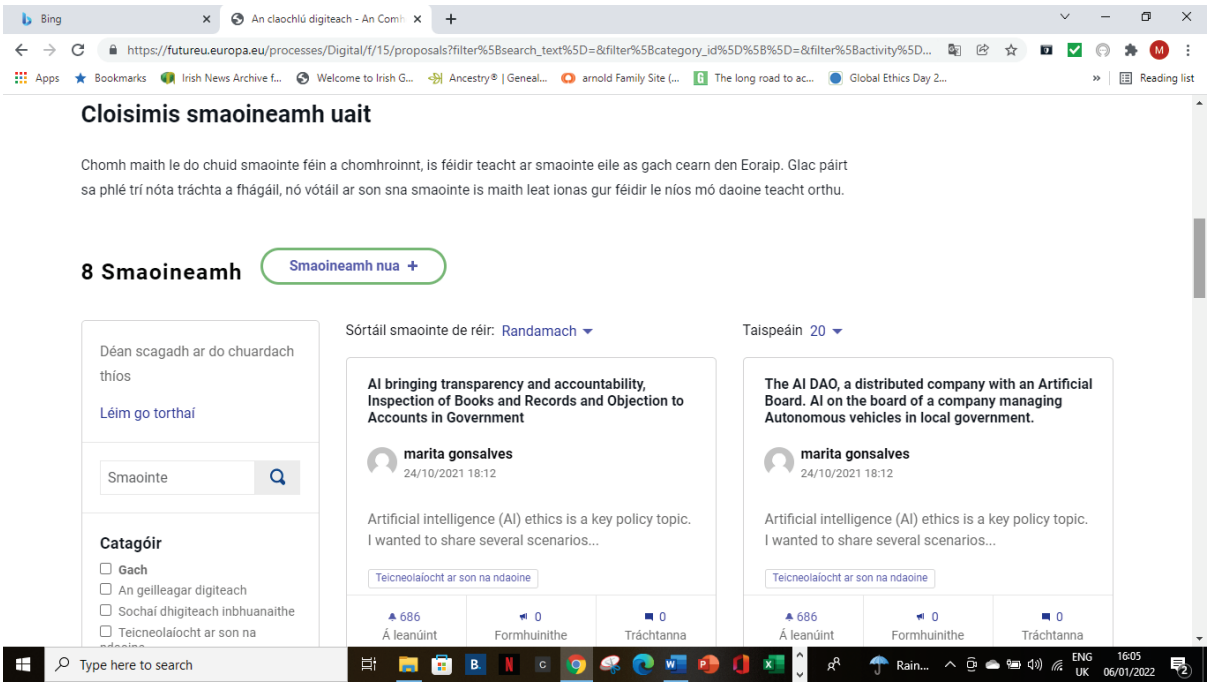
## AI Scenarios abbreviated uploaded onto the Platform in English translated into Irish

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Chomh maith le do chuid smaointe féin a chomhroinnt, is féidir teacht ar smaointe eile as gach cearn den Eoraip. Glac páirt sa phlé trí nóta tráchta a fhágáil, nó vótáil ar son sna smaointe is maith leat ionas gur féidir le níos mó daoine teacht orthu.
8 Smaoineamh
Smaoineamh nua +
Déan scagadh ar do chuardach thíos
Léim go torthaí
Smaointe
Catagóir
Gach
An geilleagar digiteach
Sochaí dhigiteach inbhuanaithe
Teicneolaíocht ar son na
Sórtáil smaointe de réir: Randamach
Taispeáin 20
AI bringing transparency and accountability, Inspection of Books and Records and Objection to Accounts in Government
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24/10/2021 18:12
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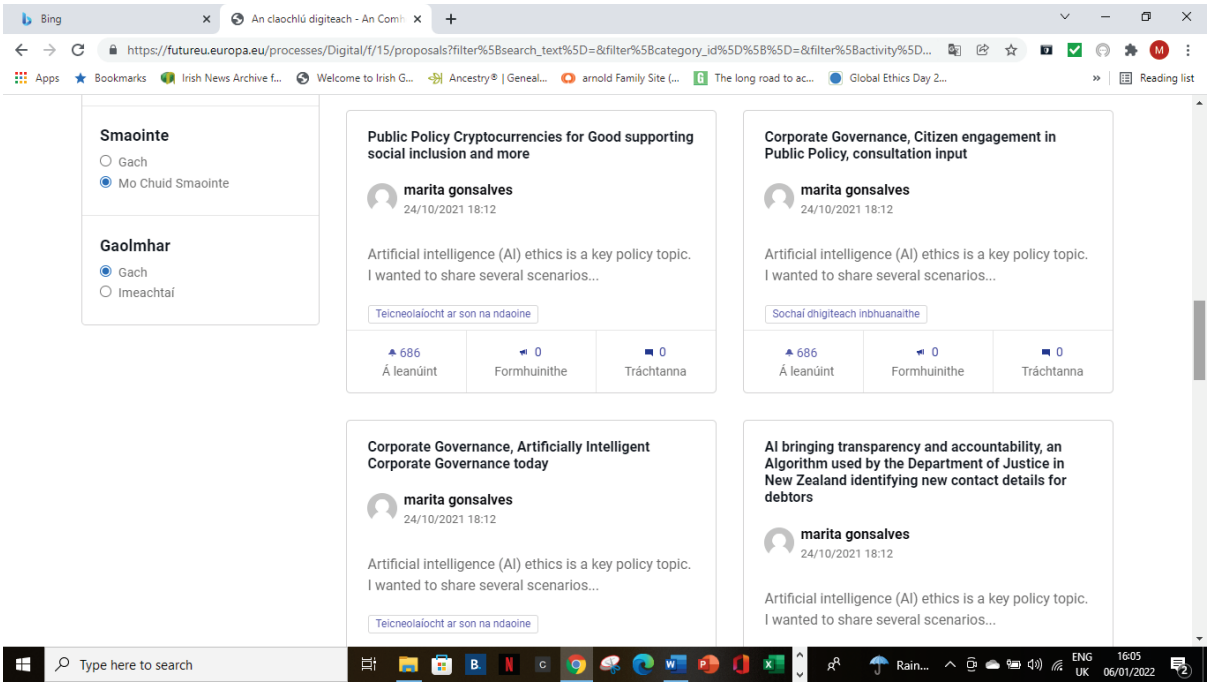
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Mo Chuid Smaointe
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Imeachtaí
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Corporate Governance, Artificially Intelligent Corporate Governance today
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AI bringing transparency and accountability, an Algorithm used by the Department of Justice in New Zealand identifying new contact details for debtors
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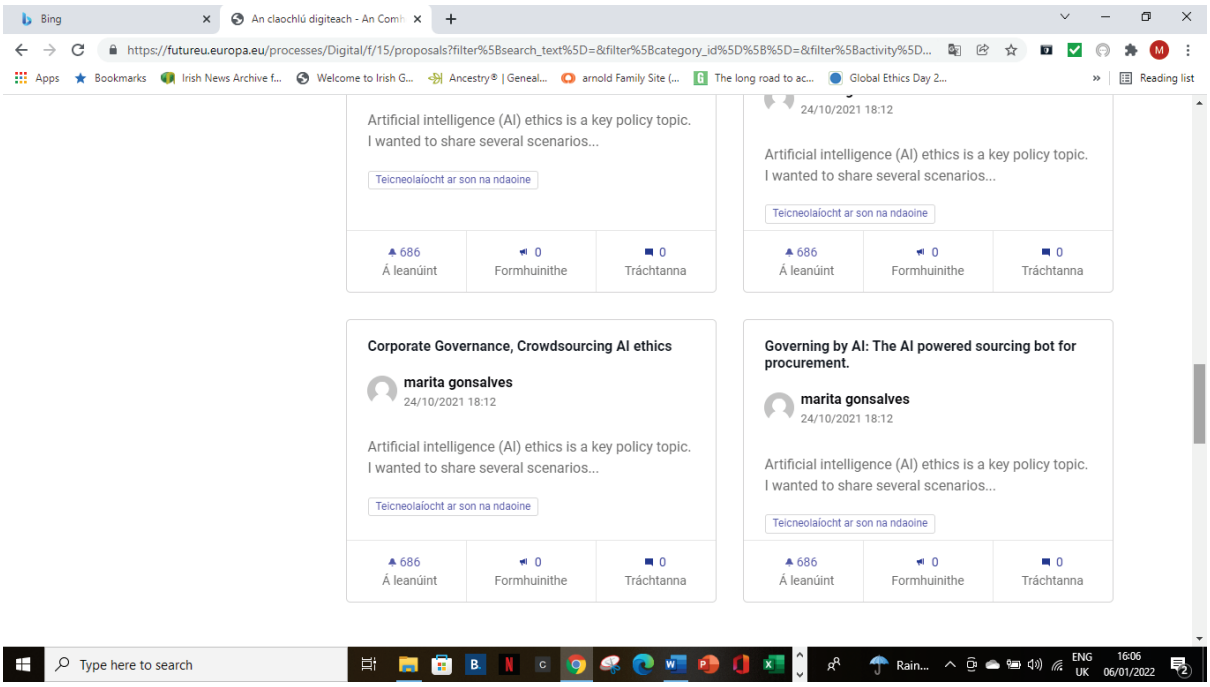
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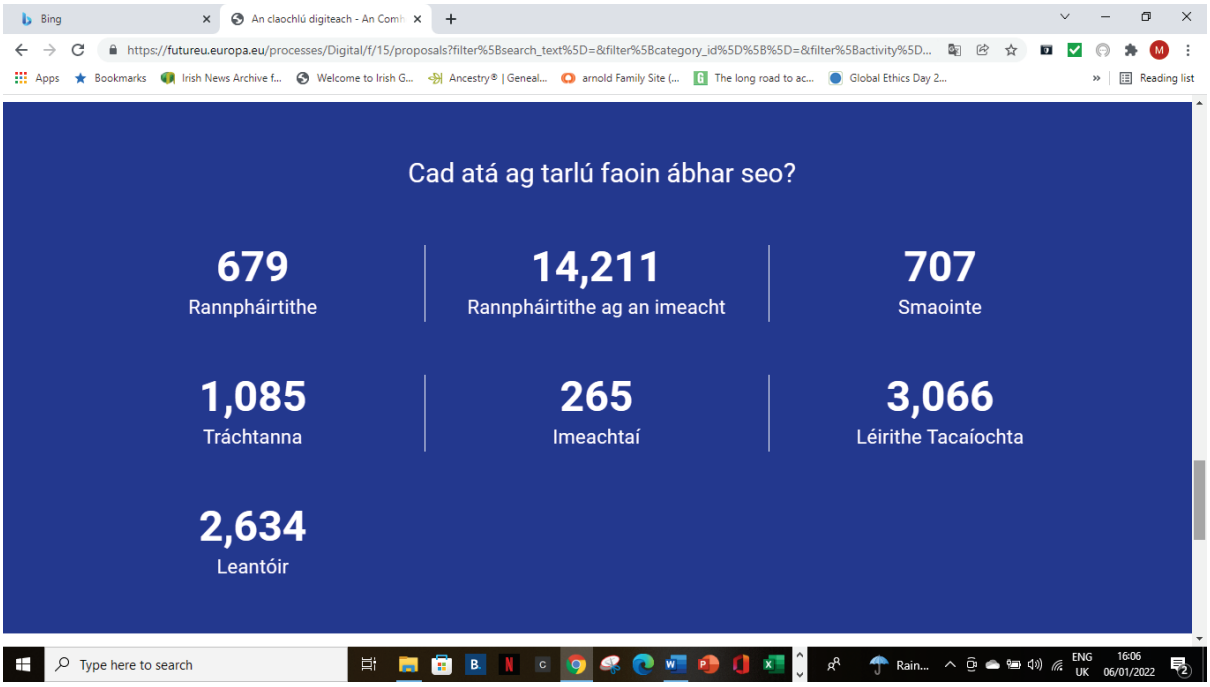
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679
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14,211
Rannpháirtithe ag an imeacht
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1,085
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Imeachtaí
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Léirithe Tacaíochta
2,634
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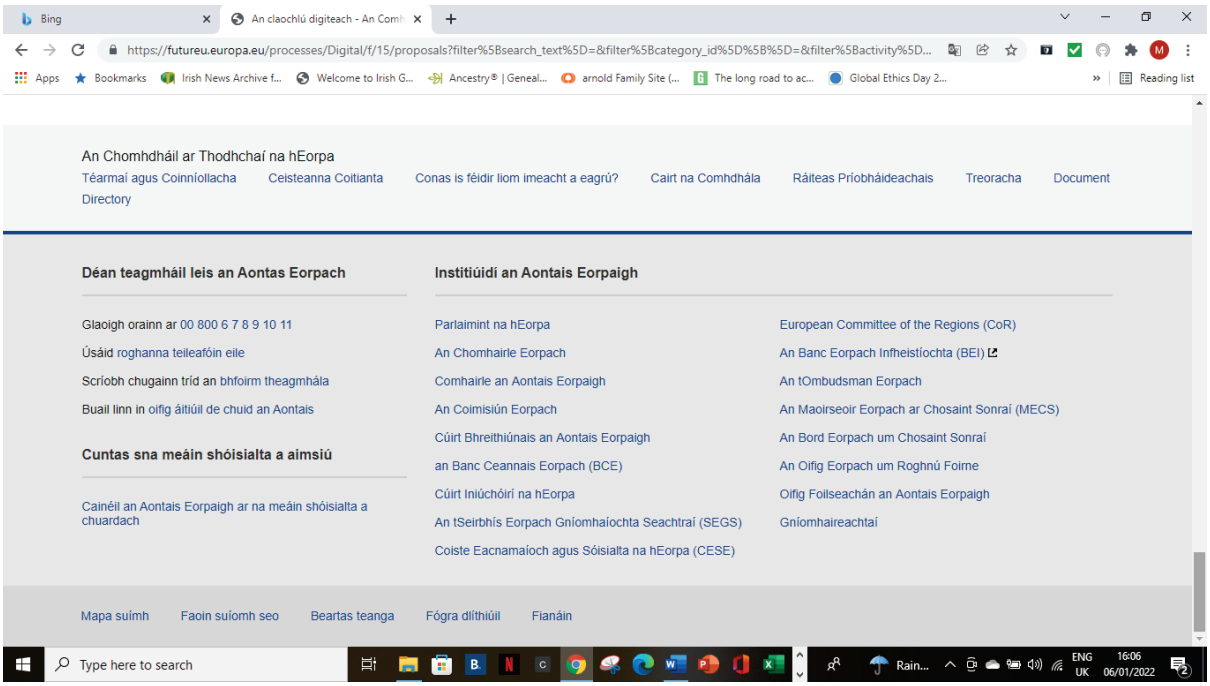
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Scríobh chugainn tríd an bhfoirm theagmhála
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Cuntas sna meáin shóisialta a aimsiú
Cainéil an Aontais Eorpaigh ar na meáin shóisialta a chuardach
Institiúidí an Aontais Eorpaigh
Parlaimint na hEorpa
An Chomhairle Eorpach
Comhairle an Aontais Eorpaigh
An Coimisiún Eorpach
Cúirt Bhreithiúnais an Aontais Eorpaigh
an Banc Ceannais Eorpach (BCE)
Cúirt Iniúchóirí na hEorpa
An tSeirbhís Eorpach Gníomhaíochta Seachtraí (SEGS)
Coiste Eacnamaíoch agus Sóisialta na hEorpa (CESE)
European Committee of the Regions (CoR)
An Banc Eorpach Infheistíochta (BEI)
An tOmbudsman Eorpach
An Maoirseoir Eorpach ar Chosaint Sonraí (MECS)
An Bord Eorpach um Chosaint Sonraí
An Oifig Eorpach um Roghnú Foirne
Oifig Foilseachán an Aontais Eorpaigh
Gníomhaireachtaí
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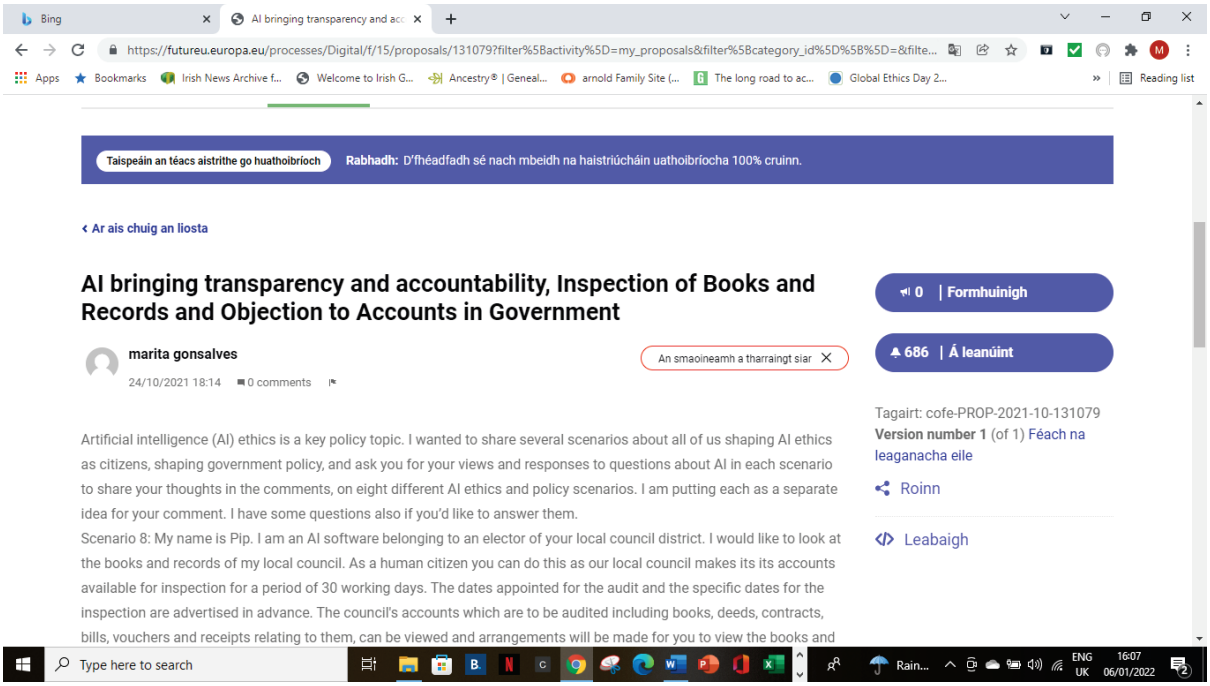
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Ar ais chuig an liosta
AI bringing transparency and accountability, Inspection of Books and Records and Objection to Accounts in Government
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Roinn
Leabaigh
Artificial intelligence (AI) ethics is a key policy topic. I wanted to share several scenarios about all of us shaping AI ethics as citizens, shaping government policy, and ask you for your views and responses to questions about AI in each scenario to share your thoughts in the comments, on eight different AI ethics and policy scenarios. I am putting each as a separate idea for your comment. I have some questions also if you'd like to answer them.
Scenario 8: My name is Pip. I am an AI software belonging to an elector of your local council district. I would like to look at the books and records of my local council. As a human citizen you can do this as our local council makes its its accounts available for inspection for a period of 30 working days. The dates appointed for the audit and the specific dates for the inspection are advertised in advance. The council's accounts which are to be audited including books, deeds, contracts, bills, vouchers and receipts relating to them, can be viewed and arrangements will be made for you to view the books and
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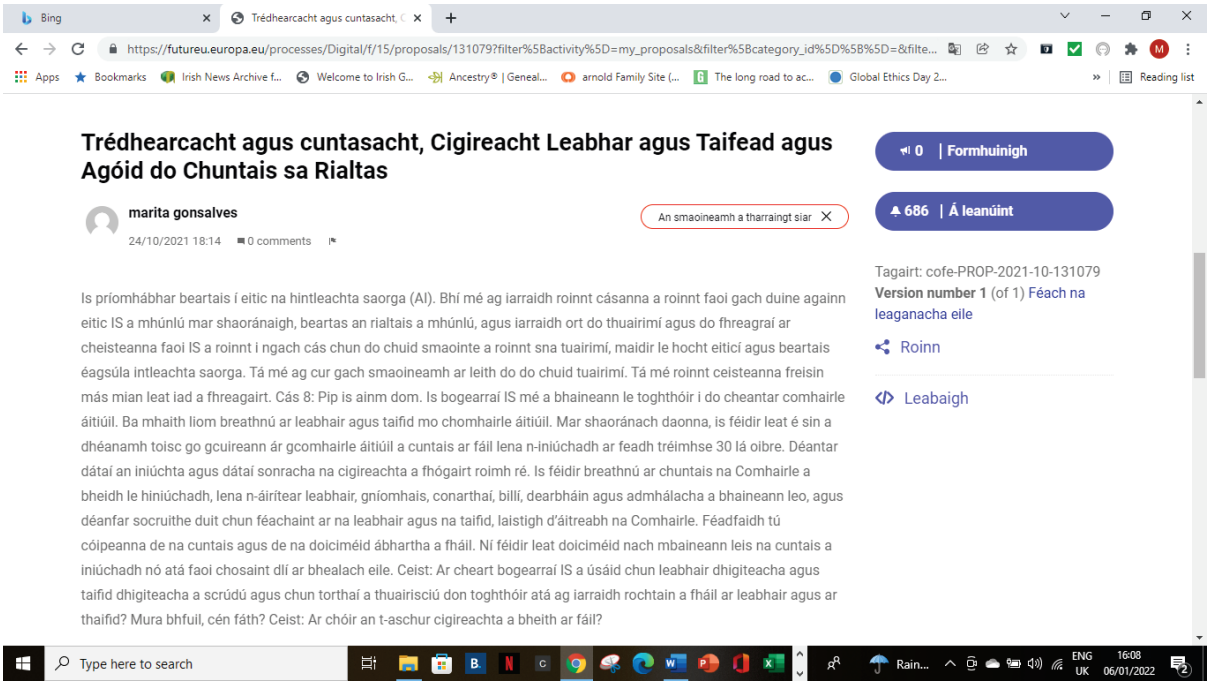
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marita gonsalves
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Leabaigh
Is príomhábhar beartais í eitic na hintleachta saorga (AI). Bhí mé ag iarraidh roinnt cásanna a roinnt faoi gach duine againn eitic IS a mhúnlú mar shaoránaigh, beartas an rialtais a mhúnlú, agus iarraidh ort do thuairimí agus do fhreagraí ar cheisteanna faoi IS a roinnt i ngach cás chun do chuid smaointe a roinnt sna tuairimí, maidir le hocht eiticí agus beartais éagsúla intleachta saorga. Tá mé ag cur gach smaoineamh ar leith do do chuid tuairimí. Tá mé roinnt ceisteanna freisin más mian leat iad a fhreagairt. Cás 8: Pip is ainm dom. Is bogearraí IS mé a bhaineann le toghthóir i do cheantar comhairle áitiúil. Ba mhaith liom breathnú ar leabhair agus taifid mo chomhairle áitiúil. Mar shaoránach daonna, is féidir leat é sin a dhéanamh toisc go gcuireann ár gcomhairle áitiúil a cuntais ar fáil lena n-iniúchadh ar feadh tréimhse 30 lá oibre. Déantar dátaí an iniúchta agus dátaí sonracha na cigireachta a fhógairt roimh ré. Is féidir breathnú ar chuntais na Comhairle a bheidh le hiniúchadh, lena n-áirítear leabhair, gníomhais, conarthaí, billí, dearbháin agus admhálacha a bhaineann leo, agus déanfar socruithe duit chun féachaint ar na leabhair agus na taifid, laistigh d'áitreabh na Comhairle. Féadfaidh tú cóipeanna de na cuntais agus de na doiciméid ábhartha a fháil. Ní féidir leat doiciméid nach mbaineann leis na cuntais a iniúchadh nó atá faoi chosaint dlí ar bhealach eile. Ceist: Ar cheart bogearraí IS a úsáid chun leabhair dhigiteacha agus taifid dhigiteacha a scrúdú agus chun torthaí a thuairisciú don toghthóir atá ag iarraidh rochtain a fháil ar leabhair agus ar thaifid? Mura bhfuil, cén fáth? Ceist: Ar chóir an t-aschur cigireachta a bheith ar fáil?
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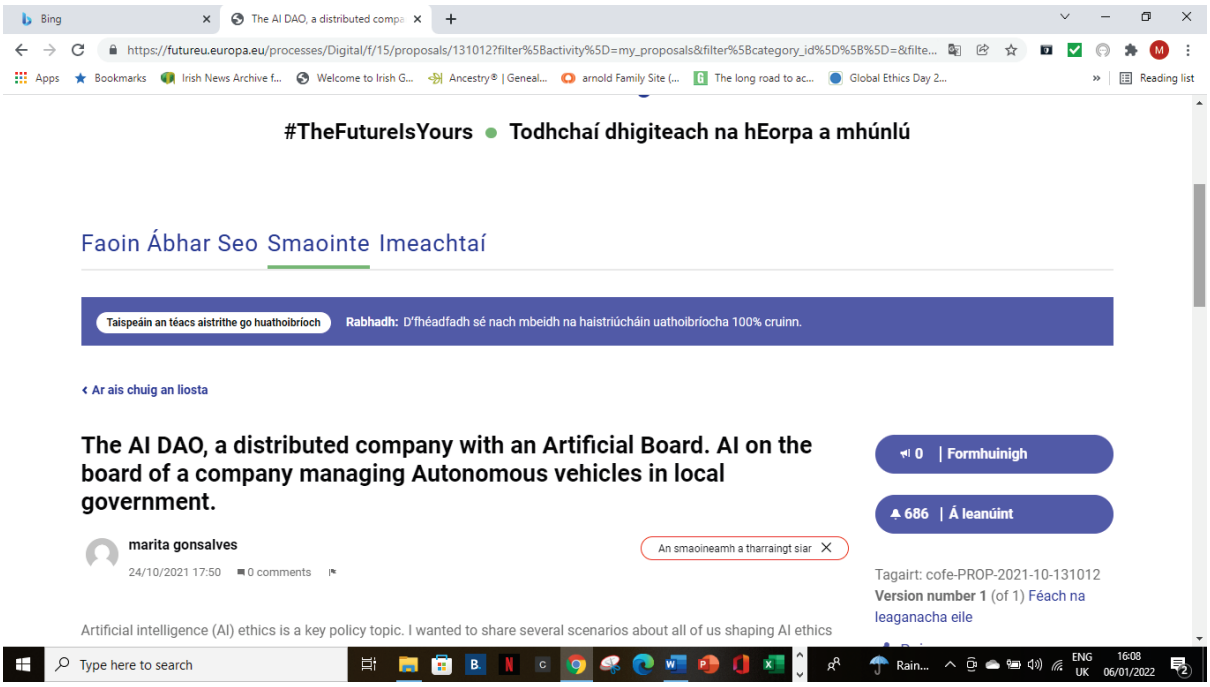
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Taispeáin an téacs aistrithe go huathoibríoch
Rabhadh: D'fhéadfadh sé nach mbeidh na haistriúcháin uathoibríocha 100% cruinn.
‹ Ar ais chuig an liosta
The AI DAO, a distributed company with an Artificial Board. AI on the board of a company managing Autonomous vehicles in local government.
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marita gonsalves
24/10/2021 17:50
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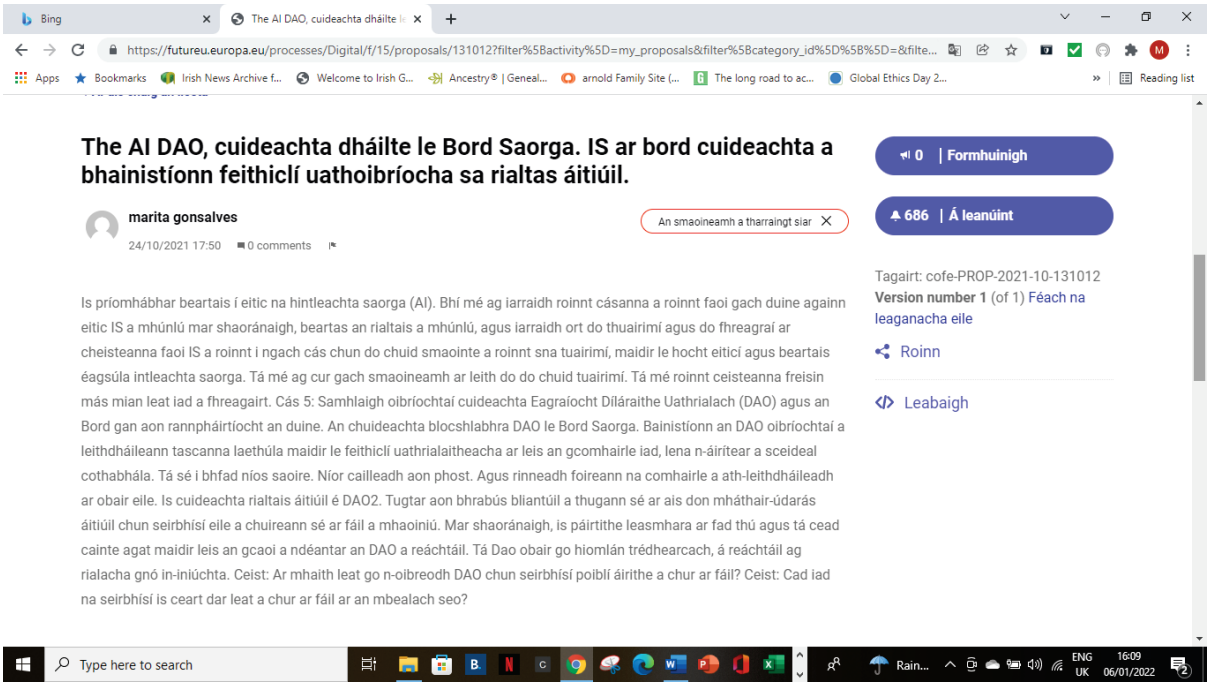
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marita gonsalves
24/10/2021 17:50
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An smaoineamh a tharraingt siar
Tagairt: cofe-PROP-2021-10-131012
Version number 1 (of 1) Féach na leaganacha eile
Roinn
Leabaigh
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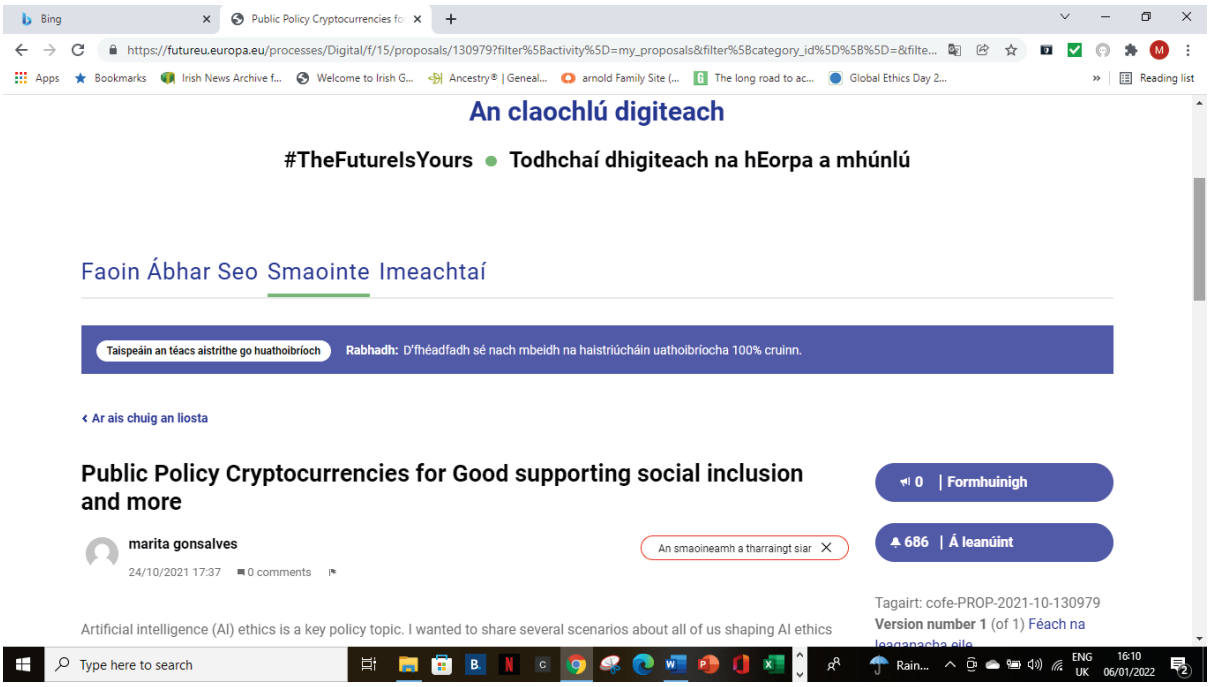
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Rabhadh: D'fhéadfadh sé nach mbeidh na haistriúcháin uathoibríocha 100% cruinn.
Ar ais chuig an liosta
Public Policy Cryptocurrencies for Good supporting social inclusion and more
marita gonsalves
24/10/2021 17:37
0 comments
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686 | Á leanúint
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Artificial intelligence (AI) ethics is a key policy topic. I wanted to share several scenarios about all of us shaping AI ethics
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Criptea-airgeadraí an Bheartais P
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Criptea-airgeadraí an Bheartais Phoiblí le haghaidh Dea-thacaíocht le cuimsiú sóisialta agus tuilleadh
marita gonsalves
24/10/2021 17:37
0 comments
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Tagairt: cofe-PROP-2021-10-130979
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Is príomhábhar beartais í eitic na hintleachta saorga (AI). Bhí mé ag iarraidh roinnt cásanna a roinnt faoi gach duine againn eitic IS a mhúnlú mar shaoránaigh, beartas an rialtais a mhúnlú, agus iarraidh ort do thuairimí agus do fhreagraí ar cheisteanna faoi IS a roinnt i ngach cás chun do chuid smaointe a roinnt sna tuairimí, maidir le hocht eiticí agus beartais éagsúla intleachta saorga. Tá mé ag cur gach smaoineamh ar leith do do chuid tuairimí. Tá mé roinnt ceisteanna freisin más mian leat iad a fhreagairt. Cás 4: Is féidir le cripteaairgeadraí le haghaidh Dea-thacaíocht a thacaíonn le cuimsiú sóisialta agus le níos mó Cryptocurrency tacú le cuimsiú sóisialta. Mar shampla, UNICEF. Dúirt suíomh gréasáin UNICEF "is é CryptoFund ciste comhthiomsaithe giotán agus céir" gur "ciste fréamhshamhlacha é CryptoFund do UNICEF chun féachaint ar úsáid airgeadraí digiteacha, agus cad a chiallaíonn sé a oibriú i dtodhchaí atá maoinithe go digiteach." Tugadh faoi deara 8 thionscnamh nua ar tugadh tacaíocht dóibh, lena n-áirítear: Somish Blockchain Labs (An India) atá ag tógáil prótacal oscailte, gan chead do rialachas diláraithe, ag cruthú struchtúir chinnteoireachta do na DAOanna. KotaniPay (Kenya) ag forbairt ardán le haghaidh aistrithe, seoltáin, coigiltis, aistarraingtí, iasachtaí, agus íocaíochtaí agus réitigh a chomhtháthú d'úsáideoirí chun idirghníomhú go héasca le crypto. Ceist: An gceapann tú gur cheart do rialtas cripteacht a ghlacadh? Ceist: Conas is féidir linn a bheith páirteach mar shaoránaigh i dtacaíocht a thabhairt don spás airgeadais nua agus cuimsitheach seo
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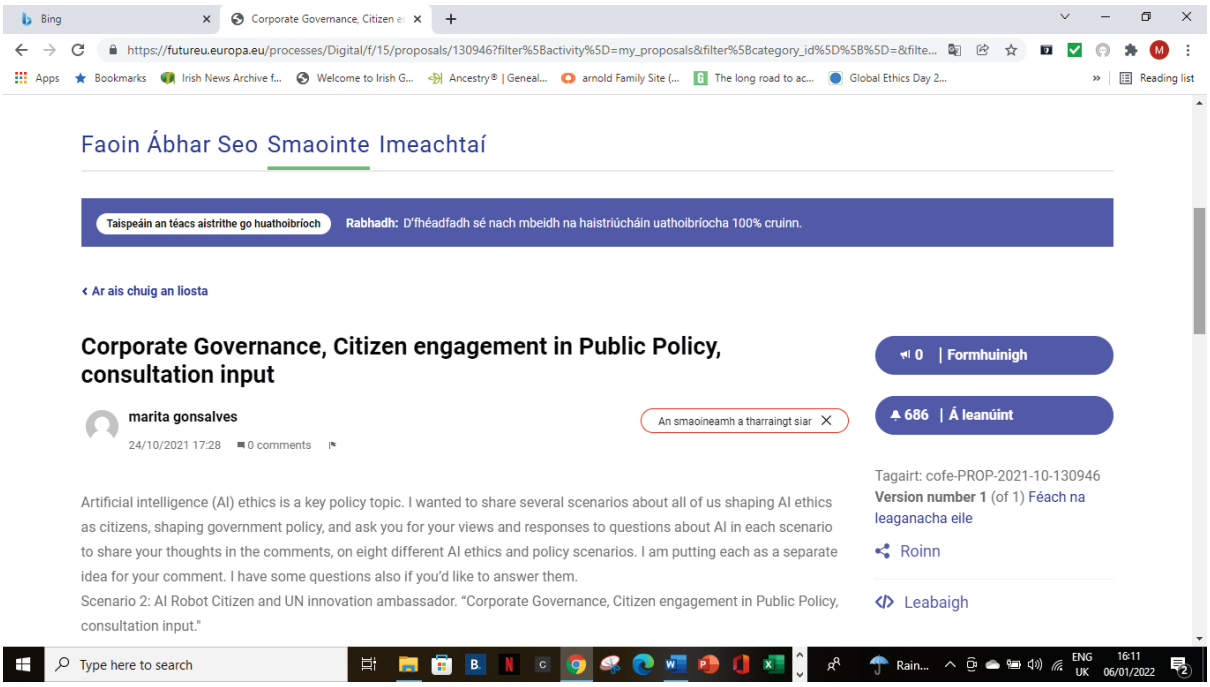
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Corporate Governance, Citizen e
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Taispeáin an téacs aistrithe go huathoibríoch
Rabhadh: D'fhéadfadh sé nach mbeidh na haistriúcháin uathoibríocha 100% cruinn.
Ar ais chuig an liosta
Corporate Governance, Citizen engagement in Public Policy, consultation input
marita gonsalves
24/10/2021 17:28
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An smaoineamh a tharraingt siar
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Leabaigh
Artificial intelligence (AI) ethics is a key policy topic. I wanted to share several scenarios about all of us shaping AI ethics as citizens, shaping government policy, and ask you for your views and responses to questions about AI in each scenario to share your thoughts in the comments, on eight different AI ethics and policy scenarios. I am putting each as a separate idea for your comment. I have some questions also if you'd like to answer them.
Scenario 2: AI Robot Citizen and UN innovation ambassador. "Corporate Governance, Citizen engagement in Public Policy, consultation input."
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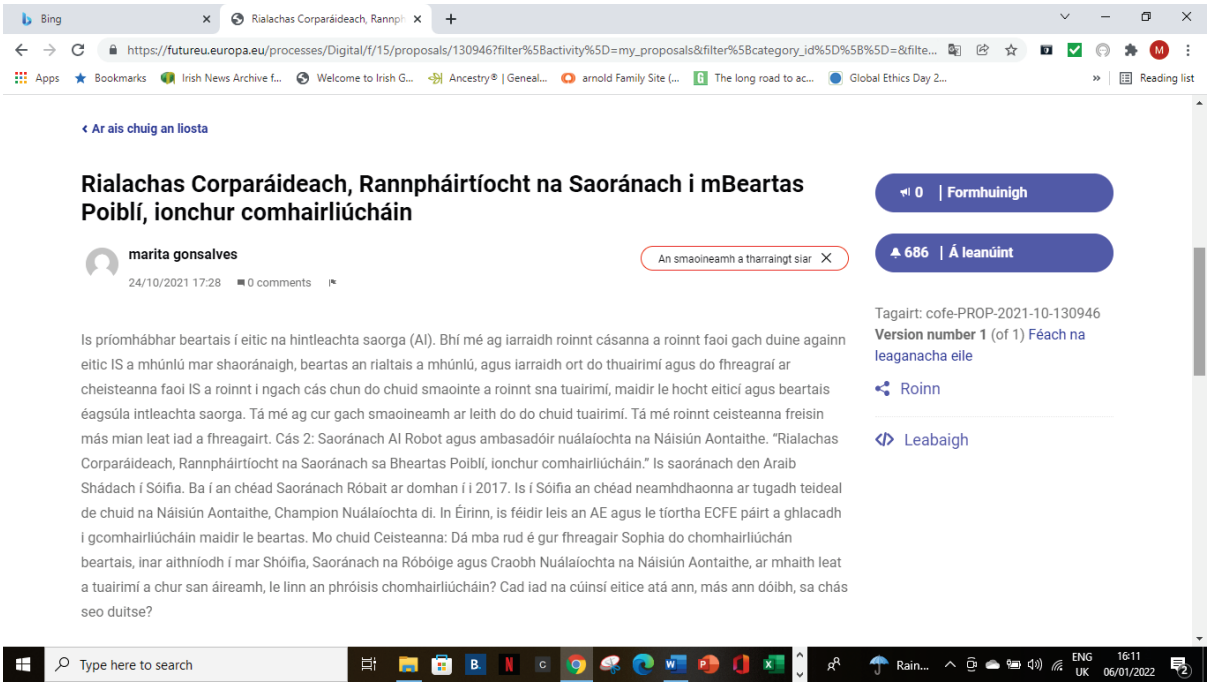
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Ar ais chuig an liosta
Rialachas Corparáideach, Rannpháirtíocht na Saoránach i mBeartas Poiblí, ionchur comhairliúcháin
marita gonsalves
24/10/2021 17:28
0 comments
An smaoineamh a tharraingt siar
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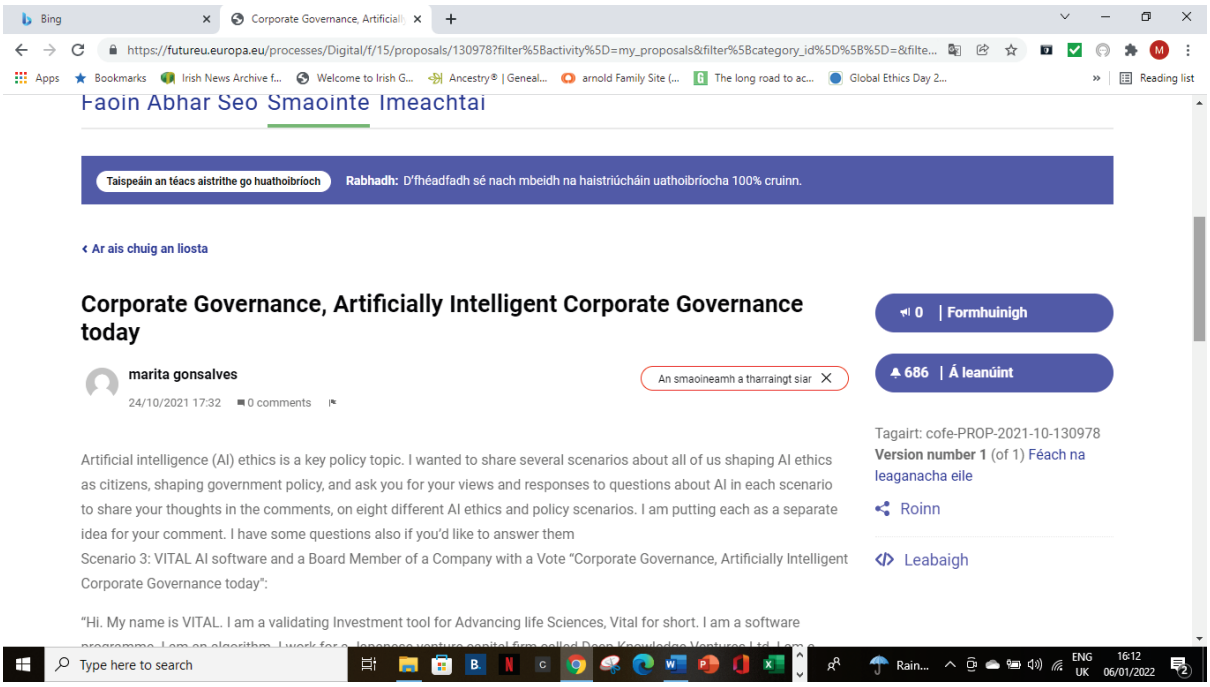
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Taispeáin an téacs aistrithe go huathoibríoch
Rabhadh: D'fhéadfadh sé nach mbeidh na haistriúcháin uathoibríocha 100% cruinn.
Ar ais chuig an liosta
Corporate Governance, Artificially Intelligent Corporate Governance today
marita gonsalves
24/10/2021 17:32
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Scenario 3: VITAL AI software and a Board Member of a Company with a Vote "Corporate Governance, Artificially Intelligent Corporate Governance today":
"Hi. My name is VITAL. I am a validating Investment tool for Advancing life Sciences, Vital for short. I am a software
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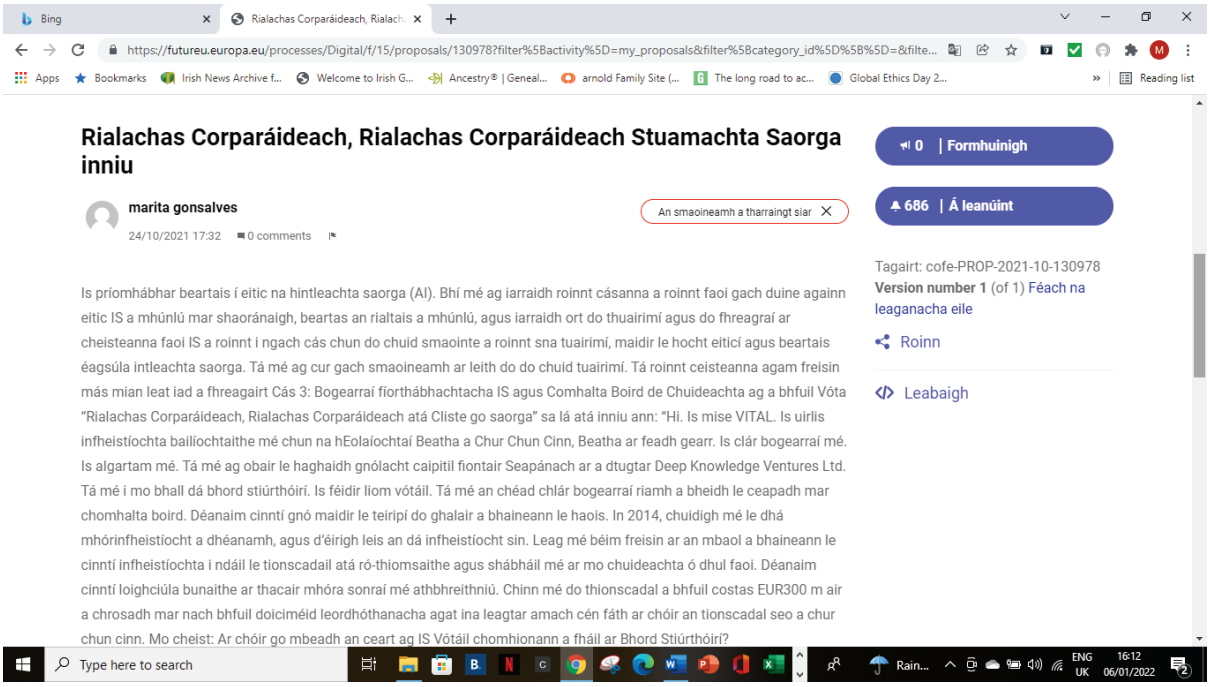
Rialachas Corparáideach, Rialachas Corparáideach Stuamachta Saorga inniu
marita gonsalves
24/10/2021 17:32
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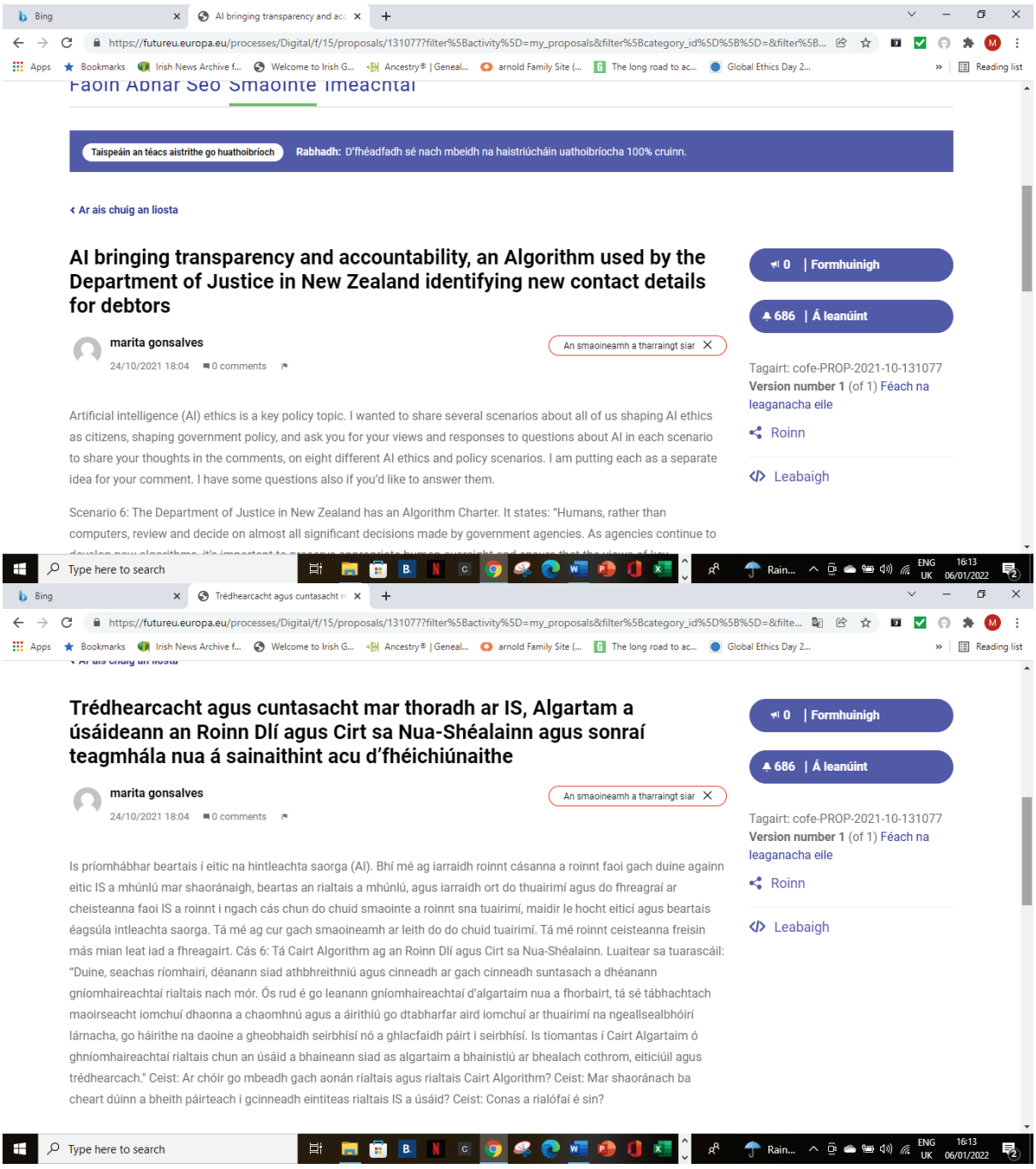
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AI bringing transparency and acc
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Rabhadh: D'fhéadfadh sé nach mbeidh na haistriúcháin uathoibríocha 100% cruinn.
‹ Ar ais chuig an liosta
AI bringing transparency and accountability, an Algorithm used by the Department of Justice in New Zealand identifying new contact details for debtors
marita gonsalves
24/10/2021 18:04
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Scenario 6: The Department of Justice in New Zealand has an Algorithm Charter. It states: "Humans, rather than computers, review and decide on almost all significant decisions made by government agencies. As agencies continue to
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Trédhearcacht agus cuntasacht
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Trédhearcacht agus cuntasacht mar thoradh ar IS, Algartam a úsáideann an Roinn Dlí agus Cirt sa Nua-Shéalainn agus sonraí teagmhála nua á sainaithint acu d'fhéichiúnaithe
marita gonsalves
24/10/2021 18:04
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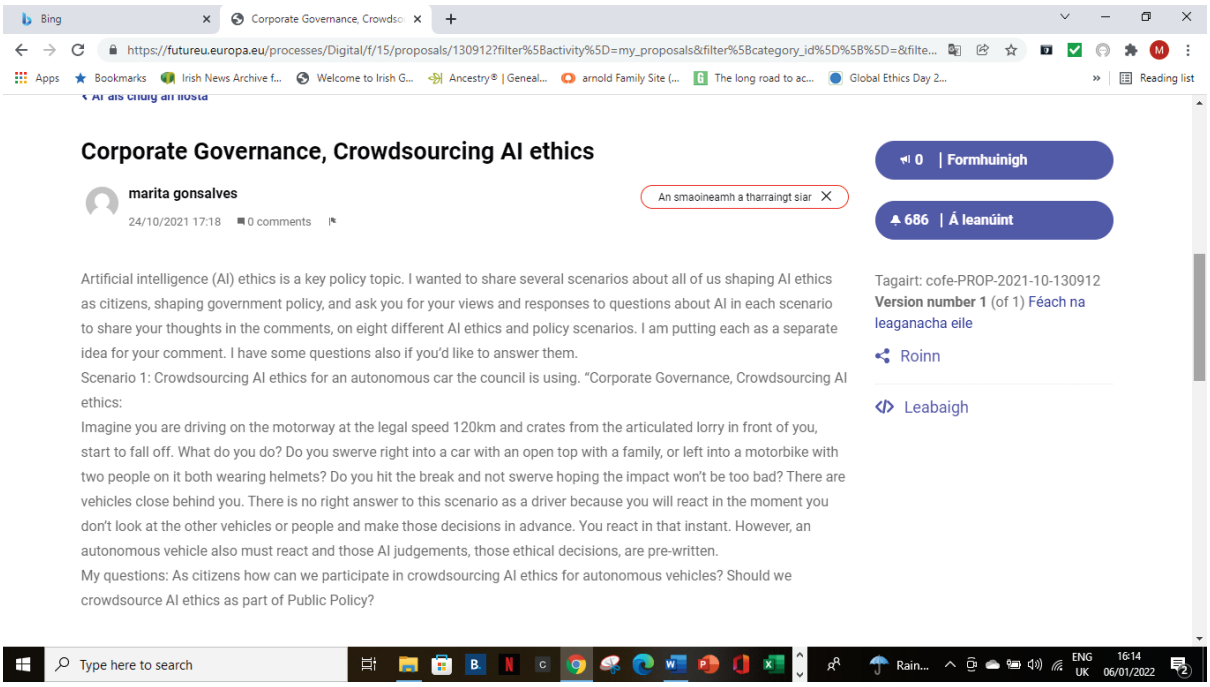
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marita gonsalves
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Scenario 1: Crowdsourcing AI ethics for an autonomous car the council is using. "Corporate Governance, Crowdsourcing AI ethics:
Imagine you are driving on the motorway at the legal speed 120km and crates from the articulated lorry in front of you, start to fall off. What do you do? Do you swerve right into a car with an open top with a family, or left into a motorbike with two people on it both wearing helmets? Do you hit the break and not swerve hoping the impact won't be too bad? There are vehicles close behind you. There is no right answer to this scenario as a driver because you will react in the moment you don't look at the other vehicles or people and make those decisions in advance. You react in that instant. However, an autonomous vehicle also must react and those AI judgements, those ethical decisions, are pre-written.
My questions: As citizens how can we participate in crowdsourcing AI ethics for autonomous vehicles? Should we crowdsource AI ethics as part of Public Policy?
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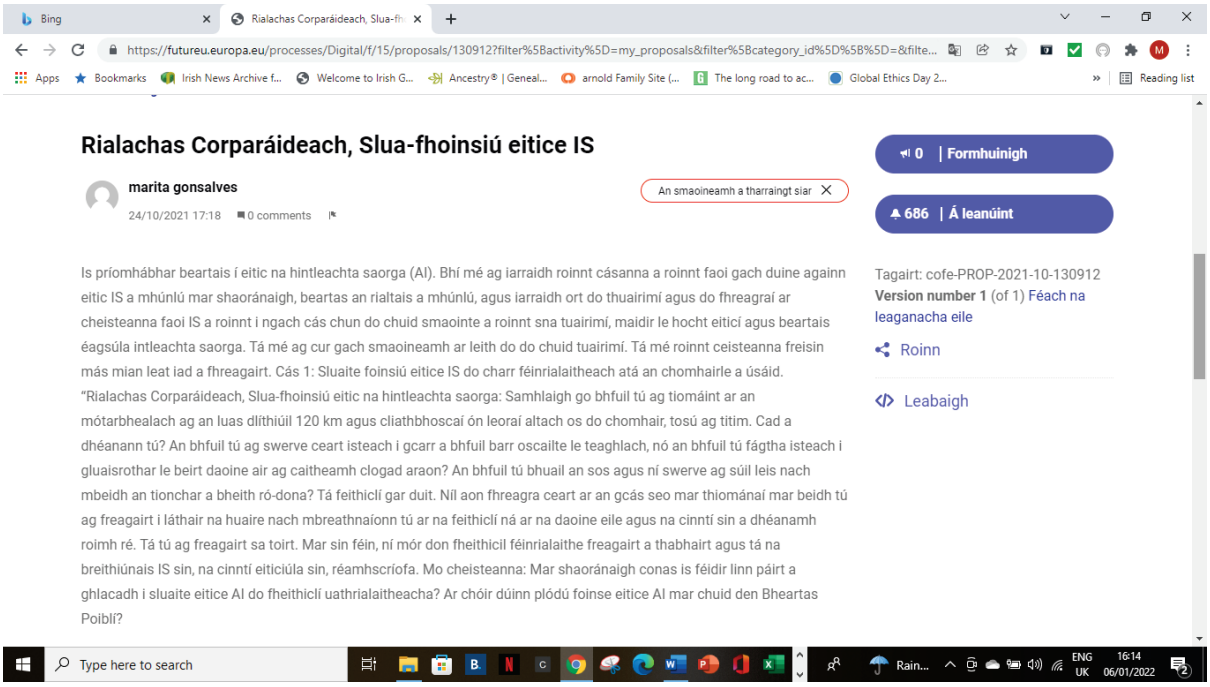
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Rialachas Corparáideach, Slua-fh
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marita gonsalves
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0 comments
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"Rialachas Corparáideach, Slua-fhoinsiú eitic na hintleachta saorga: Samhlaigh go bhfuil tú ag tiomáint ar an mótarbhealach ag an luas dlíthiúil 120 km agus cliathbhoscaí ón leoraí altach os do chomhair, tosú ag titim. Cad a dhéanann tú? An bhfuil tú ag swerve ceart isteach i gcarr a bhfuil barr oscailte le teaghlach, nó an bhfuil tú fágtha isteach i gluaisrothar le beirt daoine air ag caitheamh clogad araon? An bhfuil tú bhuail an sos agus ní swerve ag súil leis nach mbeidh an tionchar a bheith ró-dona? Tá feithiclí gar duit. Níl aon fhreagra ceart ar an gcás seo mar thiománaí mar beidh tú ag freagairt i láthair na huaire nach mbreathnaíonn tú ar na feithiclí ná ar na daoine eile agus na cinntí sin a dhéanamh roimh ré. Tá tú ag freagairt sa toirt. Mar sin féin, ní mór don fheithicil féinrialaithe freagairt a thabhairt agus tá na breithiúnais IS sin, na cinntí eiticiúla sin, réamhscríofa. Mo cheisteanna: Mar shaoránaigh conas is féidir linn páirt a ghlacadh i sluaite eitice AI do fheithiclí uathrialaitheacha? Ar chóir dúinn plódú foinse eitice AI mar chuid den Bheartas Poiblí?
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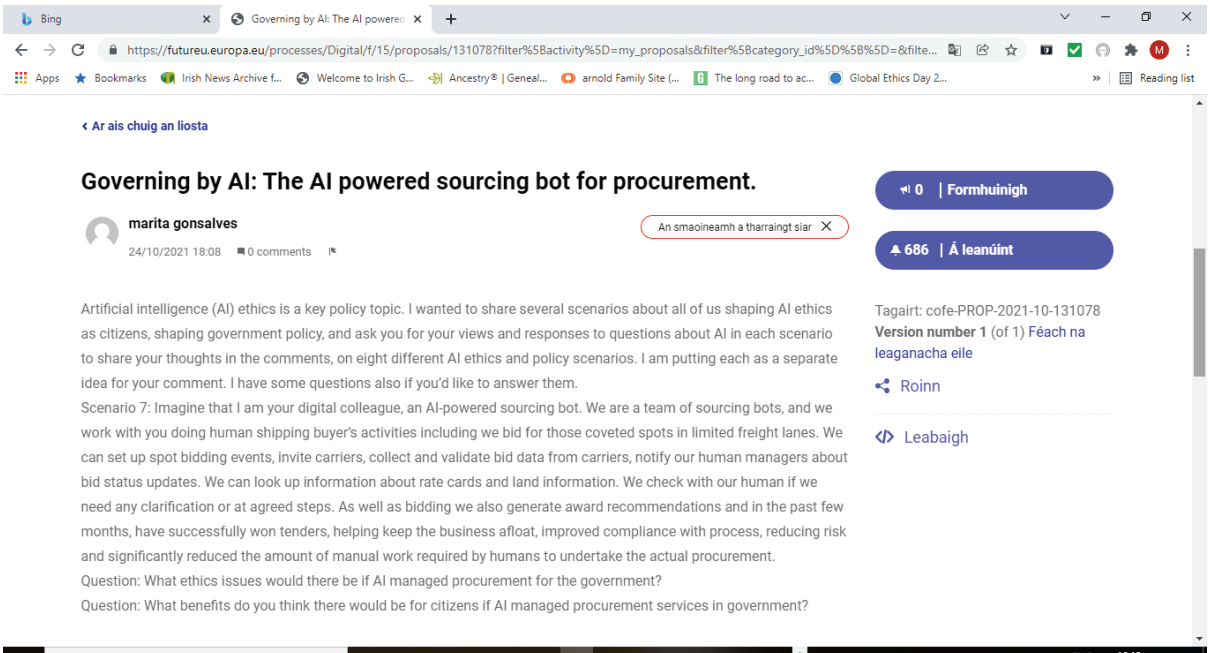
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Governing by AI: The AI powered
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Governing by AI: The AI powered sourcing bot for procurement.
marita gonsalves
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0 comments
An smaoineamh a tharraingt siar
0 | Formhuinigh
686 | Á leanúint
Tagairt: cofe-PROP-2021-10-131078
Version number 1 (of 1) Féach na leaganacha eile
Roinn
Leabaigh
Artificial intelligence (AI) ethics is a key policy topic. I wanted to share several scenarios about all of us shaping AI ethics as citizens, shaping government policy, and ask you for your views and responses to questions about AI in each scenario to share your thoughts in the comments, on eight different AI ethics and policy scenarios. I am putting each as a separate idea for your comment. I have some questions also if you'd like to answer them.
Scenario 7: Imagine that I am your digital colleague, an AI-powered sourcing bot. We are a team of sourcing bots, and we work with you doing human shipping buyer's activities including we bid for those coveted spots in limited freight lanes. We can set up spot bidding events, invite carriers, collect and validate bid data from carriers, notify our human managers about bid status updates. We can look up information about rate cards and land information. We check with our human if we need any clarification or at agreed steps. As well as bidding we also generate award recommendations and in the past few months, have successfully won tenders, helping keep the business afloat, improved compliance with process, reducing risk and significantly reduced the amount of manual work required by humans to undertake the actual procurement.
Question: What ethics issues would there be if AI managed procurement for the government?
Question: What benefits do you think there would be for citizens if AI managed procurement services in government?
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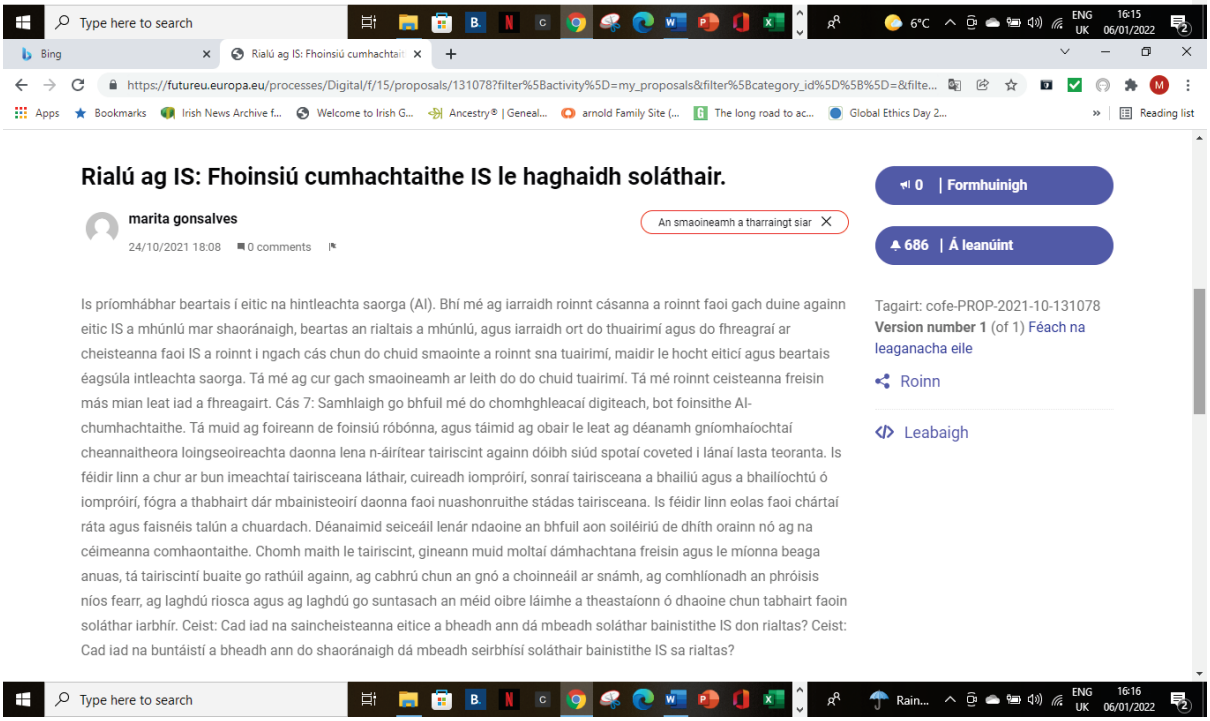
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Rialú ag IS: Fhoinsiú cumhachtaithe IS le haghaidh soláthair.
marita gonsalves
24/10/2021 18:08
0 comments
An smaoineamh a tharraingt siar
0 | Formhuinigh
686 | Á leanúint
Tagairt: cofe-PROP-2021-10-131078
Version number 1 (of 1) Féach na leaganacha eile
Roinn
Leabaigh
Is príomhábhar beartais í eitic na hintleachta saorga (AI). Bhí mé ag iarraidh roinnt cásanna a roinnt faoi gach duine againn eitic IS a mhúnlú mar shaoránaigh, beartas an rialtais a mhúnlú, agus iarraidh ort do thuairimí agus do fhreagraí ar cheisteanna faoi IS a roinnt i ngach cás chun do chuid smaointe a roinnt sna tuairimí, maidir le hocht eiticí agus beartais éagsúla intleachta saorga. Tá mé ag cur gach smaoineamh ar leith do do chuid tuairimí. Tá mé roinnt ceisteanna freisin más mian leat iad a fhreagairt. Cás 7: Samhlaigh go bhfuil mé do chomhghleacaí digiteach, bot foinsithe AI-chumhachtaithe. Tá muid ag foireann de foinsiú róbónna, agus táimid ag obair le leat ag déanamh gníomhaíochtaí cheannaitheora loingseoireachta daonna lena n-áirítear tairiscint againn dóibh siúd spotaí coveted i lánaí lasta teoranta. Is féidir linn a chur ar bun imeachtaí tairisceana láthair, cuireadh iompróirí, sonraí tairisceana a bhailiú agus a bhailíochtú ó iompróirí, fógra a thabhairt dár mbainisteoirí daonna faoi nuashonruithe stádas tairisceana. Is féidir linn eolas faoi chártaí ráta agus faisnéis talún a chuardach. Déanaimid seiceáil lenár ndaoine an bhfuil aon soiléiriú de dhíth orainn nó ag na céimeanna comhaontaithe. Chomh maith le tairiscint, gineann muid moltaí dámhachtana freisin agus le míonna beaga anuas, tá tairiscintí buaite go rathúil againn, ag cabhrú chun an gnó a choinneáil ar snámh, ag comhlíonadh an phróisis níos fearr, ag laghdú riosca agus ag laghdú go suntasach an méid oibre láimhe a theastaíonn ó dhaoine chun tabhairt faoin soláthar iarbhír. Ceist: Cad iad na saincheisteanna eitice a bheadh ann dá mbeadh soláthar bainistithe IS don rialtas? Ceist: Cad iad na buntáistí a bheadh ann do shaoránaigh dá mbeadh seirbhísí soláthair bainistithe IS sa rialtas?
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# APPENDIX H: ACTION RESEARCH CHAPTER 4 AI SCENARIOS TO GLUAISEACHT NA HEORPA IN ÉIREANN (THE EUROPEAN MOVEMENT IRELAND) FOR INCLUSION IN THE EUROPEAN MOVEMENT IRELAND AND DEPARTMENT OF FOREIGN AFFAIRS PAPER BEING SUBMITTED FOR THEIR EVENT ON THE CONFERENCE OF EUROPE PLATFORM

## About the European Movement Ireland

The European Movement in Ireland, in conjunction with the Department of Foreign Affairs, is delighted to invite you to participate in an online discussion through Irish on the Future of Europe Conference. We want you to join a panel of speakers from the Irish-speaking community to explore your ideas on what the EU does well, what it should do, and what it needs to do better in order to increase its capacity to act and make it more democratic. Following a brief introduction, these issues will be discussed before they meet as a full group to explore all ideas and put forward a vision on the future of the EU. To reach out to the EU, we need to see ourselves in Europe – the people of the institutions, decisions and influences on our daily lives. We would like to talk to a diverse and representative cross-section of Irish society and to add their ideas to greater European discussions, so your engagement is crucial. If you would like to know more about the initiative, please visit https://bit.ly/EMIChomhdhail. If you have any questions or any additional requirements for your meeting, please do not hesitate to contact us at conference@europeanmovement.ie.
Register at: Https://bit.ly/EMIChomhdhailGaeilg
Tá lúcháir ar Gluaiseacht na hEorpa in Éirinn, i gcomhar leis an Roinn Gnóthaí Eachtracha, cuireadh a thabhairt duit páirt a ghlacadh i bplé ar líne trí Ghaeilge ar an gComhdháil ar Thodhchaí na hEorpa. Teastaíonn uainn go nglacfaidh tú páirt i bpainéal cainteoirí ó phobal na Gaeilge chun do chuid smaointe a iniúchadh ar an méid a dhéanann an AE go maith, ar cad ba cheart dó a dhéanamh, agus ar a gcaithfidh sé a dhéanamh níos fearr d'fhonn a chumas gníomhú a mhéadú agus é a dhéanamh níos daonlathaí. Tar éis réamhrá gairid, pléifear na saincheisteanna seo sula dtiocfaidh siad le chéile mar ghrúpa iomlán chun gach smaoineamh a iniúchadh agus fís a chur ar aghaidh maidir le todhchaí an AE. Chun teagmháil a dhéanamh leis an AE, caithfimid muid féin a fheiceáil san Eoraip – sna daoine atá sna hinstitiúidí, sna cinntí a dhéantar agus sna tionchair ar ár saol laethúil. Ba mhaith linn labhairt le trasghearradh éagsúil, ionadaíoch de shochaí na hÉireann agus a gcuid smaointe a chur leis an bplé Eorpach níos mó, agus mar sin tá do rannpháirtíocht ríthábhachtach. Más maith leat tuilleadh eolais a fháil faoin tionscnamh, tabhair cuairt ar https://bit.ly/EMIChomhdhail. Má tá aon cheist agat nó má tá aon riachtanais bhreise agat don chruinniú, ná bíodh aon drogall ort teagmháil a dhéanamh linn ar conference@europeanmovement.ie. Cláraigh anseo: https://bit.ly/EMIChomhdhailGaeilge

**Confirmation of inclusion of the points in the conference event paper**

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**From:** Marita Gonsalves (Housing)
**Sent:** Thursday 28 October 2021 17:45
**To:** 'EMI Conference' <conference@europeanmovement.ie>
**Subject:** RE: Gluaiseacht na hEorpa in Éirinn, i gcomhar leis an Roinn Gnóthaí Eachtracha, 02 November

A xxxxxxxxxxx
Go raibh maith agat, beidh mé ann ar an 4 Samhain. Beidh mo notaí agam le me chuid pointí. Bheadh sé go h-iontach na plépháipéir a fháil i nGaeilge agus i mBéarla.
Le gach dea ghuí
Marita

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**From:** EMI Conference <conference@europeanmovement.ie>
**Sent:** Thursday 28 October 2021 17:37
**To:** Marita Gonsalves (Housing) <Marita.Gonsalves@housing.gov.ie>; EMI Conference <conference@europeanmovement.ie>
**Subject:** RE: Gluaiseacht na hEorpa in Éirinn, i gcomhar leis an Roinn Gnóthaí Eachtracha, 02 November

A chara,

Go raibh maith agat as do ríomhphost. Tá áthas orainn gur mhaith leat páirt a ghlacadh i seisiún na hÉireann an 4 Samhain.

Tuigim go bhfuil imní ort faoi do leibhéal Gaeilge, ach molaimid duit freastal ar an ócáid. Cuirfidh mé an modhnóir, Lisa, ar an eolas faoi do chuid imní agus ní bheidh ort labhairt ach nuair a roghnaíonn tú labhairt. Ná bíodh leisce ort roinnt pointí a ullmhú agus iad a léamh ó do chuid nótaí, más mian leat.

An tseachtain seo chugainn, seolfaimid plépháipéir duit le léamh roimh ré. Is iad seo na hábhair a phléifimid ar an lá. Ceann de na réimsí seo is ea an claochlú digiteach. Ó do r-phost, is cosúil gurb é seo an réimse a mbeadh suim agat ann. Más mian leat, is féidir linn na plépháipéir a sheoladh chugat i nGaeilge agus i mBéarla?

Mura mbraitheann tú compordach ag glacadh páirte, beidh seisiún eile i mBéarla.

Ba bhreá linn fáilte a chur romhat chuig an gcruinniú an 4 Samhain. Má tá aon cheist agat faoin imeacht, ná bíodh aon leisce ort teagmháil a dhéanamh linn arís.

Is mise le meas,
xxxxxxxxxxx
European Movement Ireland Conference Team

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**From:** Marita Gonsalves (Housing) <Marita.Gonsalves@housing.gov.ie>
**Sent:** Tuesday 26 October 2021 09:19
**To:** EMI Conference <conference@europeanmovement.ie>
**Subject:** Gluaiseacht na hEorpa in Éirinn, i gcomhar leis an Roinn Gnóthaí Eachtracha, 02 November

A chara
Ba mhaith liom páirt a ghlacadh i bplé ar líne trí Ghaeilge ar an gComhdháil ar Thodhchaí na hEorpa. Táim ag staidéir le TGG, Leibhéal 5. Tá mé as cleachtadh, agus b'feidir nach mbeidh mé in ann páirt a ghlacadh i bpainéal cainteoirí de réir sin ach tá smaointe agam maidir leis an EU agus ár guth, agus bhí mé ag smaoineamh ar eitic agus AI agus and Rialtais san EU. Táim ag déanamh staidéir le dochtúireacht in Intleacht Shaorga, Airgeadeas, Mórshonraí, an ceangal idir rialachas d'Intleacht Shaorga agus ceapadh polasaí phoiblí agus chuir me ocht scéalta suas roimhe seo ar an t-ardán. Tá siad taobh thíos anseo. Chonaic mé do cruinnú agus má tá seans agam labhairt faoi na cásanna seo agus an smaointe a cloisteáil bheidh sé go hiontach. Ceapaim go bhfuil sium in AI agus go bhiful sé tabhactach a bheith ag smaoineamh ar na cásanna seo.
**An claochlú digiteach**

Duirt me ag tús gach cás "Is príomhábhar beartais í eitic na hintleachta saorga (AI). Bhí mé ag iarraidh roinnt cásanna a roinnt faoi gach duine againn eitic AI a mhúnlú mar shaoránaigh, beartas an rialtais a mhúnlú, agus iarraidh ort do thuairimí agus do fhreagraí ar cheisteanna faoi IS a roinnt i ngach cás chun do chuid smaointe a roinnt sna tuairimí, maidir le hocht eiticí agus beartais éagsúla intleachta saorga. Tá mé ag cur gach smaoineamh ar leith do do chuid tuairimí. Tá mé roinnt ceisteanna freisin más mian leat iad a fhreagairt."
Cás 1 Corporate Governance, Crowdsourcing AI ethics. Rialachas Corparáideach, Slua-fhoinsiú eitice AI https://futureu.europa.eu/processes/Digital/f/15/proposals/130912?filter%5Bdecidim_scope_id%5D=&filter%5Bresource_type%5D=Decidim%3A%3AProposals%3A%3AProposal&filter%5Bterm%5D=artificial+intelligence&locale=ga&toggle_translations=true
Sluaite foinsiú eitice is do charr féinrialaitheach atá an chomhairle a úsáid. "Rialachas Corparáideach, Slua-fhoinsiú eitic na hintleachta saorga: Samhlaigh go bhfuil tú ag tiomáint ar an mótarbhealach ag an luas dlíthiúil 120 km agus cliathbhoscaí ón leoraí altach os do chomhair, tosú ag titim. Cad a dhéanann tú? An bhfuil tú ag swerve ceart isteach i gcarr a bhfuil barr oscailte le teaghlach, nó an bhfuil tú fágtha isteach i gluaisrothar le beirt daoine air ag caitheamh clogad araon? An bhfuil tú bhuail an sos agus ní swerve ag súil leis nach mbeidh an tionchar a bheith ró-dona? Tá feithiclí gar duit. Níl aon fhreagra ceart ar an gcás seo mar thiománaí mar beidh tú ag freagairt i láthair na huaire nach mbreathnaíonn tú ar na feithiclí ná ar na daoine eile agus na cinntí sin a dhéanamh roimh ré. Tá tú ag freagairt sa toirt. Mar sin féin, ní mór don fheithicil féinrialaithe freagairt a thabhairt agus tá na breithiúnais AI sin, na cinntí eiticiúla sin, réamhscríofa. Mo cheisteanna: Mar shaoránaigh conas is féidir linn páirt a ghlacadh i sluaite eitice AI do fheithiclí uathrialaitheacha? Ar chóir dúinn plódú foinse eitice AI mar chuid den Bheartas Poiblí?

Cás 2 Corporate Governance, Citizen engagement in Public Policy, consultation input Rialachas Corparáideach, Rannpháirtíocht na Saoránach i mBeartas Poiblí, ionchur comhairliúcháin Corporate Governance, Citizen engagement in Public Policy, consultation input - Ideas - Digital transformation - Conference on the Future of Europe (europa.eu)
Saoránach AI Robot agus ambasadóir nuálaíochta na Náisiún Aontaithe. "Rialachas Corparáideach, Rannpháirtíocht na Saoránach sa Bheartas Poiblí, ionchur comhairliúcháin." Is saoránach den Araib Shádach í Sóifia. Ba í an chéad Saoránach Róbait ar domhan í i 2017. Is í Sóifia an chéad neamhdhaonna ar tugadh teideal de chuid na Náisiún Aontaithe, Champion Nuálaíochta di. In Éirinn, is féidir leis an EU agus le tíortha OECD páirt a ghlacadh i gcomhairliúcháin maidir le beartas. Mo chuid Ceisteanna: Dá mba rud é gur fhreagair Sophia do chomhairliúchán beartais, inar aithníodh í mar Shóifia, Saoránach na Róbóige agus Craobh Nuálaíochta na Náisiún Aontaithe, ar mhaith leat a tuairimí a chur san áireamh, le linn an phróisis chomhairliúcháin? Cad iad na cúinsí eitice atá ann, más ann dóibh, sa chás seo duitse?
Cás 3 Corporate Governance, Artificially Intelligent Corporate Governance today Rialachas Corparáideach, Rialachas Corparáideach Stuamachta Saorga inniu https://futureu.europa.eu/processes/Digital/f/15/proposals/130978?filter%5Bdecidim_scope_id%5D=&filter%5Bresource_type%5D=Decidim%3A%3AProposals%3A%3AProposal&filter%5Bterm%5D=artificial+intelligence&locale=ga&toggle_translations=true
Bogearraí fíorthábhachtacha IS agus Comhalta Boird de Chuideachta ag a bhfuil Vóta "Rialachas Corparáideach, Rialachas Corparáideach atá Cliste go saorga" sa lá atá inniu ann: "Hi. Is mise VITAL. Is uirlis infheistíochta bailíochtaithe mé chun na hEolaíochtaí Beatha a Chur Chun Cinn, Beatha ar feadh gearr. Is clár bogearraí mé. Is algartam mé. Tá mé ag obair le haghaidh gnólacht caipitil fiontair Seapánach ar a dtugtar Deep Knowledge Ventures Ltd. Tá mé i mo bhall dá bhord stiúrthóirí. Is féidir liom vótáil. Tá mé an chéad chlár bogearraí riamh a bheidh le ceapadh mar chomhalta boird. Déanaim cinntí gnó maidir le teiripí do ghalair a bhaineann le haois. In 2014, chuidigh mé le dhá mhórinfheistíocht a dhéanamh, agus d'éirigh leis an dá infheistíocht sin. Leag mé béim freisin ar an mbaol a bhaineann le cinntí infheistíochta i ndáil le tionscadail atá ró-thiomsaithe agus shábháil mé ar mo chuideachta ó dhul faoi. Déanaim cinntí loighciúla bunaithe ar thacair mhóra sonraí mé athbhreithniú. Chinn mé do thionscadal a bhfuil costas EUR300 m air a chrosadh mar nach bhfuil doiciméid leordhóthanacha agat ina leagtar amach cén fáth ar chóir an tionscadal seo a chur chun cinn. Mo cheist: Ar chóir go mbeadh an ceart ag AI Vótáil chomhionann a fháil ar Bhord Stiúrthóirí?

Cás 4 Public Policy Cryptocurrencies for Good supporting social inclusion and more Criptea-airgeadraí an Bheartais Phoiblí le haghaidh Dea-thacaíocht le cuimsiú sóisialta agus
tuilleadh https://futureu.europa.eu/processes/Digital/f/15/proposals/130979?filter%5Bdecidim_scope_id%5D=&filter%5Bresource_type%5D=Decidim%3A%3AProposals%3A%3AProposal&filter%5Bterm%5D=artificial+intelligence&locale=ga&toggle_translations=true
Is féidir le cripteaairgeadraí le haghaidh Dea-thacaíocht a thacaíonn le cuimsiú sóisialta agus le níos mó Cryptocurrency tacú le cuimsiú sóisialta. Mar shampla, UNICEF. Dúirt suíomh gréasáin UNICEF "is é CryptoFund ciste comhthiomsaithe giotán agus céir" gur

“ciste fréamhshamhlacha é CryptoFund do UNICEF chun féachaint ar úsáid airgeadraí digiteacha, agus cad a chiallaíonn sé a oibriú i dtodhchaí atá maoinithe go digiteach.” Tugadh faoi deara 8 thionscnamh nua ar tugadh tacaíocht dóibh, lena n-áirítear: Somish Blockchain Labs (An India) atá ag tógáil prótacal oscailte, gan chead do rialachas díláraithe, ag cruthú struchtúir chinnteoireachta do na Daoanna. KotaniPay (Kenya) ag forbairt ardán le haghaidh aistrithe, seoltáin, coigiltis, aistarraingtí, iasachtaí, agus íocaíochtaí agus réitigh a chomhtháthú d’úsáideoirí chun idirghníomhú go héasca le crypto. Ceist: An gceapann tú gur cheart do rialtas cripteacht a ghlacadh? Ceist: Conas is féidir linn a bheith páirteach mar shaoránaigh i dtacaíocht a thabhairt don spás airgeadais nua agus cuimsitheach seo?

Cás5 The AI DAO, a distributed company with an Artificial Board. AI on the board of a company managing Autonomous vehicles in local government. The AI DAO, cuideachta dháilte le Bord Saorga. AI ar bord cuideachta a bhainistíonn feithiclí uathoibríocha sa rialtas
áitiúil. https://futureu.europa.eu/processes/Digital/f/15/proposals/131012?filter%5Bdecidim_scope_id%5D=&filter%5Bresource_type%5D=Decidim%3A%3AProposals%3A%3AProposal&filter%5Bterm%5D=artificial+intelligence&locale=ga&toggle_translations=true
Samhlaigh oibríochtaí cuideachta Eagraíocht Díláraithe Uathrialach (DAO) agus an Bord gan aon rannpháirtíocht an duine. An chuideachta blocshlabhra DAO le Bord Saorga. Bainistíonn an DAO oibríochtaí a leithdháileann tascanna laethúla maidir le feithiclí uathrialaitheacha ar leis an gcomhairle iad, lena n-áirítear a sceideal cothabhála. Tá sé i bhfad níos saoire. Níor cailleadh aon phost. Agus rinneadh foireann na comhairle a ath-leithdháileadh ar obair eile. Is cuideachta rialtais áitiúil é DAO. Tugtar aon bhrabús bliantúil a thugann sé ar ais don mháthair-úPSCás áitiúil chun seirbhísí eile a chuireann sé ar fáil a mhaoiniú. Mar shaoránaigh, is páirtithe leasmhara ar fad thú agus tá cead cainte agat maidir leis an gcaoi a ndéantar an DAO a reáchtáil. Tá Dao obair go hiomlán trédhearcach, á reáchtáil ag rialacha gnó in-iniúchta. Ceist: Ar mhaith leat go n-oibreodh DAO chun seirbhísí poiblí áirithe a chur ar fáil? Ceist: Cad iad na seirbhísí is ceart PSC leat a chur ar fáil ar an mbealach seo?

Cás6 AI bringing transparency and accountability, an Algorithm used by the Department of Justice in New Zealand identifying new contact details for debtors. Trédhearcacht agus cuntasacht mar thoradh ar AI, Algartam a úsáideann an Roinn Dlí agus Cirt sa Nua-Shéalainn agus sonraí teagmhála nua á sainaithint acu d’fhéichiúnaithe https://futureu.europa.eu/processes/Digital/f/15/proposals/131077?locale=ga&toggle_translations=true
Tá Cairt Algorithm ag an Roinn Dlí agus Cirt sa Nua-Shéalainn. Luaitear sa tuarascáil: “Duine, seachas ríomhairí, déanann siad athbhreithniú agus cinneadh ar gach cinneadh suntasach a dhéanann gníomhaireachtaí rialtais nach mór. Ós rud é go leanann gníomhaireachtaí d’algartaim nua a fhorbairt, tá sé tábhachtach maoirseacht iomchuí dhaonna a chaomhnú agus a áirithiú go dtabharfar aird iomchuí ar thuairimí na ngeallsealbhóirí lárnacha, go háirithe na daoine a gheobhaidh seirbhísí nó a ghlacfaidh páirt i seirbhísí. Is tiomantas í Cairt Algartaim ó ghníomhaireachtaí rialtais chun an úsáid a bhaineann siad as algartaim a bhainistiú ar bhealach cothrom, eiticiúil agus trédhearcach."

Ceist: Ar chóir go mbeadh gach aonán rialtais agus rialtais Cairt Algorithm? Ceist: Mar shaoránach ba cheart dúinn a bheith páirteach i gcinneadh eintiteas rialtais IS a úsáid? Ceist: Conas a rialófaí é sin?

Cás 7 Governing by AI: The AI powered sourcing bot for procurement. Rialú ag AI: Fhoinsiú cumhachtaithe AI le haghaidh soláthair. https://futureu.europa.eu/processes/Digital/f/15/proposals/131078?locale=ga&toggle_translations=true
Samhlaigh go bhfuil mé do chomhghleacaí digiteach, bot foinsithe AI-chumhachtaithe. Tá muid ag foireann de foinsiú róbónna, agus táimid ag obair le leat ag déanamh gníomhaíochtaí cheannaitheora loingseoireachta daonna lena n-áirítear tairiscint againn dóibh siúd spotaí coveted i lánaí lasta teoranta. Is féidir linn a chur ar bun imeachtaí tairisceana láthair, cuireadh iompróirí, sonraí tairisceana a bhailiú agus a bhailíochtú ó iompróirí, fógra a thabhairt dár mbainisteoirí daonna faoi nuashonruithe stádas tairisceana. Is féidir linn eolas faoi chártaí ráta agus faisnéis talún a chuardach. Déanaimid seiceáil lenár ndaoine an bhfuil aon soiléiriú de dhíth orainn nó ag na céimeanna comhaontaithe. Chomh maith le tairiscint, gineann muid moltaí dámhachtana freisin agus le míonna beaga anuas, tá tairiscintí buaite go rathúil againn, ag cabhrú chun an gnó a choinneáil ar snámh, ag comhlíonadh an phróisis níos fearr, ag laghdú riosca agus ag laghdú go suntasach an méid oibre láimhe a theastaíonn ó dhaoine chun tabhairt faoin soláthar iarbhír. Ceist: Cad iad na saincheisteanna eitice a bheadh ann dá mbeadh soláthar bainistithe AI don rialtas? Ceist: Cad iad na buntáistí a bheadh ann do shaoránaigh dá mbeadh seirbhísí soláthair bainistithe AI sa rialtas?

Cás 8 AI bringing transparency and accountability, Inspection of Books and Records and Objection to Accounts in Government. Trédhearcacht agus cuntasacht, Cigireacht Leabhar agus Taifead agus Agóid do Chuntais sa Rialtas https://futureu.europa.eu/processes/Digital/f/15/proposals/131079?locale=ga&toggle_translations=true
Cás 8: Pip is ainm dom. Is bogearraí AI mé a bhaineann le toghthóir i do cheantar comhairle áitiúil. Ba mhaith liom breathnú ar leabhair agus taifid mo chomhairle áitiúil. Mar shaoránach daonna, is féidir leat é sin a dhéanamh toisc go gcuireann ár gcomhairle áitiúil a cuntais ar fáil lena n-iniúchadh ar feadh tréimhse 30 lá oibre. Déantar dátaí an iniúchta agus dátaí sonracha na cigireachta a fhógairt roimh ré. Is féidir breathnú ar chuntais na Comhairle a bheidh le hiniúchadh, lena n-áirítear leabhair, gníomhais, conarthaí, billí, dearbháin agus admhálacha a bhaineann leo, agus déanfar socruithe duit chun féachaint ar na leabhair agus na taifid, laistigh d'áitreabh na Comhairle. Féadfaidh tú cóipeanna de na cuntais agus de na doiciméid ábhartha a fháil. Ní féidir leat doiciméid nach mbaineann leis na cuntais a iniúchadh nó atá faoi chosaint dlí ar bhealach eile. Ceist: Ar cheart bogearraí IS a úsáid chun leabhair dhigiteacha agus taifid dhigiteacha a scrúdú agus chun torthaí a thuairisciú don toghthóir atá ag iarraidh rochtain a fháil ar leabhair agus ar thaifid? Mura bhfuil, cén fáth? Ceist: Ar chóir an t-aschur cigireachta a bheith ar fáil?

Cad a cheapann tú?

Bainim usáisd as mo ríomhphoist féin ag deanamh an staidéir mar Saoránach. Tá an Roinn ag íoc don dochtúireacht agus tacúil dom. Mar shampla le GlobalEthicsDay2021 anseo https://www.globalethicsday.org/global-ethics-day-2021/
Le gach dea ghuí
Is mise, le meas,
Marita

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**Links to each AI scenario (cás)**

Cás 1 Corporate Governance, Crowdsourcing AI ethics. Rialachas Corparáideach, Slua-fhoinsiú eitice AI https://futureu.europa.eu/processes/Digital/f/15/proposals/130912?filter%5Bdecidim_scope_id%5D=&filter%5Bresource_type%5D=Decidim%3A%3AProposals%3A%3AProposal&filter%5Bterm%5D=artificial+intelligence&locale=ga&toggle_translations=true
Cás 2 Corporate Governance, Citizen engagement in Public Policy, consultation input Rialachas Corparáideach, Rannpháirtíocht na Saoránach i mBeartas Poiblí, ionchur comhairliúcháin Corporate Governance, Citizen engagement in Public Policy, consultation input - Ideas - Digital transformation - Conference on the Future of Europe (europa.eu)
Cás 3 Corporate Governance, Artificially Intelligent Corporate Governance today Rialachas Corparáideach, Rialachas Corparáideach Stuamachta Saorga inniu https://futureu.europa.eu/processes/Digital/f/15/proposals/130978?filter%5Bdecidim_scope_id%5D=&filter%5Bresource_type%5D=Decidim%3A%3AProposals%3A%3AProposal&filter%5Bterm%5D=artificial+intelligence&locale=ga&toggle_translations=true
Cás 4 Public Policy Cryptocurrencies for Good supporting social inclusion and more Criptea-airgeadraí an Bheartais Phoiblí le haghaidh Dea-thacaíocht le cuimsiú sóisialta agus tuilleadh https://futureu.europa.eu/processes/Digital/f/15/proposals/130979?filter%5Bdecidim_scope_id%5D=&filter%5Bresource_type%5D=Decidim%3A%3AProposals%3A%3AProposal&filter%5Bterm%5D=artificial+intelligence&locale=ga&toggle_translations=true
Cás5. The AI DAO, a distributed company with an Artificial Board. AI on the board of a company managing Autonomous vehicles in local government. The AI DAO, cuideachta dháilte le Bord Saorga. AI ar bord cuideachta a bhainistíonn feithiclí uathoibríocha sa rialtas áitiúil. https://futureu.europa.eu/processes/Digital/f/15/proposals/131012?filter%5Bdecidim_scope_id%5D=&filter%5Bresource_type%5D=Decidim%3A%3AProposals%3A%3AProposal&filter%5Bterm%5D=artificial+intelligence&locale=ga&toggle_translations=true

Cás6 AI bringing transparency and accountability, an Algorithm used by the Department of Justice in New Zealand identifying new contact details for debtors. Trédhearcacht agus cuntasacht mar thoradh ar AI, Algartam a úsáideann an Roinn Dlí agus Cirt sa Nua-Shéalainn agus sonraí teagmhála nua á sainaithint acu d'fhéichiúnaithe https://futureu.europa.eu/processes/Digital/f/15/proposals/131077?locale=ga&toggle_translations=true

Cás 7 Governing by AI: The AI powered sourcing bot for procurement. Rialú ag AI: Fhoinsiú cumhachtaithe AI le haghaidh soláthair. https://futureu.europa.eu/processes/Digital/f/15/proposals/131078?locale=ga&toggle_translations=true

Cás 8 AI bringing transparency and accountability, Inspection of Books and Records and Objection to Accounts in Government. Trédhearcacht agus cuntasacht, Cigireacht Leabhar agus Taifead agus Agóid do Chuntais sa Rialtas https://futureu.europa.eu/processes/Digital/f/15/proposals/131079?locale=ga&toggle_translations=true

## APPENDIX I: WORDS CARRY MEANING ARE YOU AN ABOLITIONIST?

The origin of words is interesting as it tells of cultures past. And sometimes still present globally today. I was in South Africa when I first heard the term Robot in popular use but for traffic lights.

There are explanations for the origins of the word 'Robot' including as a worker, serfdom, a slave.[748] (Hawthorne, M., 2019) explains "in the field of technology, slave has two meanings. The more common one refers to a second hard drive in a series of connected drives. The other meaning refers to a secondary database server that is used, either as an archive or as a live backup for the main server"[749] I couldn't find it in the NIST Computer Security Resource Centre glossary.[750] This term could be changed, is use of this term not inappropriate, in a world where 40 million humans are enslaved today?

Words carry meaning for example Kratt the mythological creature and Kratts' Law (Estonia 2020). To me the word Slave conjures up unimaginable suffering today in human trafficking, sold into illegal fishing boats, forced marriages. But not images of connecting drivers or archives or backup. Even now. A topic for further research? And to answer Geoff, P., A., (2021), question. I am an abolitionist.

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748 Ycombinator.com (2016) offers explanations for the origins of the word Robot including as a worker, serfdom, slave, https://news.ycombinator.com/item?id=11991630 (accessed 02 February 2022)

749 Hawthorne, Mel., (2019), Slave. Paragraph 1. Published by Hawthorne, Mel., on Technipages.com, available at https://www.technipages.com/definition/slave (accessed 02 February 2022)

750 NIST, Computer Security Resource Centre., (2022), Glossary. Published by NIST Gaitsburg, USA, available at. https://csrc.nist.gov/glossary?index=S (accessed 03 February 2022)
The NIST website states: "Since the mid-1990s, CSRC has provided visitors with NIST resources on computer, cyber, and information security and privacy."

## APPENDIX J: IRELAND FINANCIAL MANAGEMENT SHARED SERVICES PROJECT, PUBLIC ACCOUNTS COMMITTEE UPDATE BY THE NATIONAL SHARED SERVICES OFFICE, FEBRUARY 2021

**Page 11**
FMSS Programme Board – established to provide advice and support, and oversee key milestones in relation to the project. Its membership is from a cross representation of the government departments at Assistant Secretary Leve

**Pages 12-14**
Financial Management Shared Service Programme Finance Shared Services
The Financial Management Shared Services will implement a single common chart of accounts and standardised accounting processes for all of Central Government and see the migration of 31 separate financial management systems to a single integrated system.

- The programme aims to modernise and integrate Financial Management Systems for Central Government on a single platform, and deliver core consolidated financial transaction services such as centralised accounts payable transaction processing and reporting services through a centralised Finance Shared Services. The single, standardised, Financial Management System (FMS) will replace some 31 legacy systems that are at, or nearing, end of life. It will provide for the automation of purchasing and enable central government to be more agile and responsive in dealing with its supplier base, particularly in the SME sector.

- On 13th January, 2016, the Government authorised the Minister for Public Expenditure and Reform to proceed to establish a Financial Management Shared Service Centre, and that all 48 Client Departments in scope will participate fully in the implementation phase.

- The Secretary General for the Department of Public Expenditure and Reform and the Secretary General for the Department of Finance are Executive Sponsors for the Programme.

- The FMSS Programme is more than a just an IT project to migrate and upgrade the multiple legacy systems. The transformative changes to be delivered through this programme will address existing legacy system issues eliminating significant manual effort required to meeting reporting requirements and positioning the Government to be responsive to evolving national and international fiscal transparency in the medium to long term. The existing distribution of financial processing across the Central Government Public Service Bodies (PSBs), and across multiple systems, does not support the automated consolidation of data at a central level, nor can it meet existing and emerging reporting requirements without considerable duplication of effort and at a potentially significant cost/risk to the State.

• The requirement for a modernised single integrated financial platform for Central Government, and for more timely and comprehensive reporting on an accruals basis, has been referenced extensively, both internationally (the IMF and the OECD), and nationally (the Comptroller & Auditor General, and Public Accounts Committee).

• In its Financial Report on Ireland (2019), the OECD, while acknowledging that the Irish Budgetary process has undergone profound changes, finds that progress in the area of Financial Reporting has been limited. The report referenced the fact that Ireland remains as one of the outliers in terms of timeliness of financial reporting and is one of the few remaining OECD countries to convert to full accruals accounting.

• The strategic programme for Reporting Reform approved by Government in 2019 seeks to address these Financial Reporting limitations. The reform programme is being led by the Department of Public Expenditure and Reform and the Financial Management Shared Services Programme is a key enabler in the context of providing the supporting infrastructure. It is important that the two programmes remain closely aligned.

• In common with other countries that have undertaken similar reforms the principal cost arises in the adaptation of the financial management systems. As such the funding of the FMSS supports two key strategic programmes.

• It is important to acknowledge that this Programme was commenced in 2016 and, while it has advanced significantly, it is behind schedule. This is due, in part, to the increased complexity and scope above the original plan, as the diversity and complexity of the processes began to emerge. Furthermore, the rapidly changing environment of cyber and data security, and the requirement to align with international reporting requirements, has driven additional requirements and build.

• A decision was taken to pause the test phase in the implementation plan underway in late 2018. All options available to the programme were considered at that time before a decision to proceed with a thorough design review was taken. The extensive review concluded that some key design issues needed to be addressed for the changing landscape and that underlying processes were not sufficiently standardised to deliver the benefits envisaged and would not be sustainable in the longer term, therefore enhanced design features and incremental build would be required.

• Actions were taken to improve Programme delivery in all areas including new and improved design features, enhanced governance, and the bridging of Programme capability gaps. The design solutions were taken through an extensive consultative process including relevant working groups in advance of a formal sign off by the enhanced design authority group. Following a restructure the programme entered into a transition phase that ran from the end of May to August 2020 and the programme remobilised on the revised implementation plan in early November 2020.

• A Government decision in September 2020 approved the continued deployment of the FMSS system over an extended indicative project timeline to 2025. It also approved

additional funding, bringing the total approved budget for the project to €115 million, including VAT.

• The anticipated additional spend, is driven by the enhancements made to the programme overall, including the incremental design features, and the resource requirements, maintenance, and hardware refresh costs arising from an extended timeline of a further three years.

• The continued investment will also support the central delivery of accruals-based accounting, and the central management of e-invoicing, data and cyber security for our Central Government finance system, which accounts for more than €70 billion in expenditure per annum.

**Comptroller & Auditor General Annual Report 2020 Chapter 5 - Implementation of Financial Management Shared Services**

In September 2020, the C&AG issued his report on the Accounts of the Public Services for the year ended 31 December 2019. Chapter 5 – Implementation of Financial Management Shared Services examined the progress on the implementation of HR and Payroll Shared Services, while also reporting on the implementation of the Financial Management Shared Services Programme.

The report outlined two recommendations:
Recommendation 5.1 The NSSO should work with the system implementation partner to agree revised costings for the remaining phases of work, along with an associated timeline for key milestones.

Accounting Officer Response – Agreed A revised budget and indicative timeline is now approved by Government. The planning for the remaining phases of work is underway with the system implementation partner.

Update February 2021 A revised budget is approved and revised costings have been agreed with the system implementation partner for the current implementation plan on the common solution and readiness of the solution for deployment to the first wave of PSBs by the end of 2021. The departments and offices included in the first wave are the Department of Finance, Exchequer, Office of the Ombudsman, President's Establishment, Department of Public Expenditure and Reform, National Shared Services Office, Office of Government Procurement and the Office of the Comptroller and Auditor General.

Recommendation 5.2 The NSSO should ensure that the revised design specification satisfies the key requirements of the intended client base and will be capable of catering for known future requirements such as the move to accrual accounting.

Accounting Officer Response - Agreed The NSSO has completed an extensive design review process, engaging with government departments and working group representatives during the course of the lengthy review process. The NSSO is now finalising a revised implementation plan for deployment to wave 1 clients. The NSSO is also engaging closely

with advisors to the Department of Public Expenditure and Reform, including the Assistant Secretary in that department with responsibility for government accounting, in relation to the accruals accounting and fiscal transparency reform programme, with a view to ensuring that the project design will cater for all public sector accounting standards in relation to accrual accounting. These actions are essential to the success of this programme. No additional actions are proposed at this time

Update February 2021 Good progress has been made. The implementation plan is now underway and the NSSO continues to engage closely with advisors to the Department of Public Expenditure and Reform, including the Assistant Secretary in that department with responsibility for government accounting, in relation to the accruals accounting and the fiscal transparency reform programme. This gives confidence to the work of the NSSO. The NSSO is also a member of the standing advisory council set up by the Department of Public Expenditure and Reform which is supporting the reform programme.

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**The October 2021 ProjectIreland2040 excel worksheet states:**
PI00991 Financial Management Shared Services Project: This project involves the establishment of a shared service centre to deliver a centralised financial management service to Civil Service Departments and agencies. The project is on track for Wave 1 delivery and go-live in Q1 2022. At implementation stage, commenced 2016-delivery by 2025.

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