



Paper outlining the deliberations of the
**TOP TEAM ON
STANDARDS IN AI**
supporting the ongoing implementation of the
National AI Strategy



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The deliberations of the Top Team on Standards in AI have been formulated into two outputs–

- this paper setting out the deliberations of the Top Team on Standards in AI (July 2023), and
- a Roadmap on AI Standards & Assurance (July 2023).

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What is AI?

Ireland's national AI strategy: *AI - Here for Good, A National Artificial Intelligence Strategy for Ireland*¹ adopts the OECD definition as follows:

*“An AI system is a machine-based system that can, for a given set of human-defined objectives, make predictions, recommendations, or decisions influencing real or virtual environments. AI systems are designed to operate with varying levels of autonomy.”*²

AI enables machines to demonstrate human-like capabilities such as reasoning, learning, planning and creativity. AI-enabled technical systems are capable of perceiving their environment and using this capability to achieve goals, provide solutions to problems, work autonomously, and adapt their behaviour based on analysis of the effects of previous activities³.

In the real world we use AI daily for a myriad of activities, such as translating text, generating subtitles, filtering email spam, personalised shopping. AI is also a critical tool in providing solutions to many complex global problems, such as to–

- improve healthcare through enhancing disease prevention and diagnosis accuracy,
- enhance efficiency in farming and agriculture,
- contribute to climate change mitigation and adaptation,
- drive efficiency in production systems through predictive maintenance, including enabling production of better longer-lasting products, and
- improve safety and security of citizens in many ways such as transport systems and safer cars, safer workplaces, protection from cybersecurity threats.

Figure 1: What is AI?

1. Introduction

1.1. Top Teams established in line with Government policy to realise opportunities in technology

In March 2019, *Future Jobs Ireland, Preparing now for Tomorrow's Economy*⁴ was published by the then Department of Business Enterprise and Innovation, setting out an ambitious programme to enhance the sustainability and resilience of the Irish economy and ensure that Irish enterprises, workforce and society as a whole, are well placed to exploit the future economic opportunities of new technologies. The Strategy identified the establishment of a Top Team in Artificial Intelligence as a means to enhance Ireland's capability in cutting edge technological areas, such as AI.



Figure 2: *Future Jobs Ireland Strategy*, features of a Top Team⁵

1.2. Top Team on Standards in AI

In 2020, following a request from the Department of Enterprise, Trade and Employment, NSAI established a Top Team on Standards in AI with the purpose of supporting AI strategy at national level. The Top Team comprised leading experts in AI with the skills to advise on national AI policy and adoption, reflecting interested stakeholders across industry, academia, civil society, the private and public sectors. It engaged

¹ Department of Enterprise, Trade & Employment, Government of Ireland (2021), *AI - Here for Good: National Artificial Intelligence Strategy for Ireland. AI - Here for Good: National Artificial Intelligence Strategy for Ireland - DETE* (enterprise.gov.ie)

² OECD Council Recommendation on Artificial Intelligence, OECD/Legal/0449, (adopted 22 May 2019). [OECD Legal Instruments](https://www.oecd.org/legal/instruments/)

³ European Parliament website (2021), *What is artificial intelligence and how is it used?* [What is artificial intelligence and how is it used? | News | European Parliament](https://www.europarl.europa.eu/press-room/en/answer-to-a-question-from-a-member-of-the-parliament/2021051101000001) ([european.eu](https://european-parliament.europa.eu))

⁴ Government of Ireland (2019), *Future Jobs Ireland 2019, Preparing Now for Tomorrow's Future. Future Jobs FINAL FINAL.pdf* (enterprise.gov.ie)

⁵ Government of Ireland (2019), *Future Jobs Ireland 2019, Preparing Now for Tomorrow's Future. Future Jobs FINAL FINAL.pdf* (enterprise.gov.ie)

widely to understand the state of play of AI development and deployment in Ireland. A list of the Top Team on Standards in AI contributors is set out in Annex A of this paper.

An interim report to guide the Top Team deliberations was finalised in August 2020⁶. The Top Team plenary meeting was opened in May 2021 by Ms. Jean Carberry, Assistant Secretary for the EU, Digital and Access at the Department of Enterprise, Trade & Employment. During the engagement phase the Top Team process involved two plenary meetings, and meetings of four working groups as follows:

- SME & Start-Up Working Group (SME WG);
- Multi-national Company Working Group (MNC WG);
- Research, Development & Innovation Working Group (RDI WG);
- Legal & Societal Working Group (Legal WG).

Based on the deliberations of the Top Team, the NSAI team used an iterative approach to hone contributions into this concise paper.

1.3. Context of this paper

In July 2021, the Department of Enterprise, Trade and Employment published Ireland's first national AI Strategy entitled *AI - Here for Good, A National Artificial Intelligence Strategy for Ireland*⁷. The Strategy sets out a vision for Ireland to become an international leader in using AI for the benefit of people in Ireland, through a people-centred, ethical approach to AI development, adoption and use. The Strategy emphasises that Ireland is well-placed to be at the forefront of AI's transformative change in light of our ongoing commitment to developing IT talent, entrepreneurship and connectivity.

At EU level it is envisaged that AI will shape the digital future of the entire Union. In April 2021 the Commission published its AI Package which included a *Communication on fostering a European approach to AI*⁸ and a *Proposal for a Regulation laying down harmonised rules on AI (EU AI Act)*⁹. This was followed by a further legislative proposal: the *Proposal for an AI Liability Directive*¹⁰, published in September 2022. The EU AI Act, when adopted, will provide the foundational regulatory structure for AI technologies across the EU and become the global benchmark for AI regulation.

In February 2022, the Department of An Taoiseach published *Harnessing Digital - The Digital Ireland Framework*¹¹ as a strategy to drive and enable digital transformation across Irish society and the economy. This national digital strategy sets out a pathway to support Ireland's ambition to be a digital leader at the heart of European and global digital developments, through: supporting the digital transformation of Irish businesses; enhancing Ireland's digital infrastructure; continuing to build digital skills across Irish society; and augmenting the digitalisation of Irish public services. It aligns with wider EU priorities, under the *EU Digital Decade*¹², and complements work towards achieving Ireland's climate targets, and the twin green and digital transitions.

1.4. Purpose of this paper

This paper seeks to concisely set out the AI Top Team consultative process deliberations, which aligned closely with the *National AI Strategy* and Ireland's digital strategy for enterprise¹³, in seeking to—

- sustain Ireland's attractiveness as a location of choice for cutting-edge global technology businesses, such as AI businesses,
- drive a step change in AI adoption across enterprise,
- nurture digital and AI start-ups, and
- ensure a modern, cohesive and well-resourced regulatory framework for digital, including AI.

⁶ National Standards Authority of Ireland (2020), Top Teams Standards in AI, Interim Report, a Guide & Reference document for the Top Team.

⁷ Department of Enterprise, Trade & Employment, Government of Ireland (2021), *AI - Here for Good: National Artificial Intelligence Strategy for Ireland*. [AI - Here for Good: National Artificial Intelligence Strategy for Ireland - DETE \(enterprise.gov.ie\)](https://enterprise.gov.ie)

⁸ European Commission website, *Shaping Europe's Digital Future – Communication on Fostering a European approach to Artificial Intelligence* [Communication on Fostering a European approach to Artificial Intelligence | Shaping Europe's digital future \(europa.eu\)](https://europa.eu)

⁹ European Commission website, *Shaping Europe's digital future - Proposal for a Regulation laying down harmonised rules on artificial intelligence (2021)*. [Proposal for a Regulation laying down harmonised rules on artificial intelligence | Shaping Europe's digital future \(europa.eu\)](https://europa.eu)

¹⁰ European Commission website, *Liability Rules for Artificial Intelligence (2022)*. [Liability Rules for Artificial Intelligence \(europa.eu\)](https://europa.eu)

¹¹ Department of the Taoiseach, Government of Ireland (2022), *Harnessing Digital - The Digital Ireland Framework*. [gov.ie - Harnessing Digital - The Digital Ireland Framework \(www.gov.ie\)](https://www.gov.ie)

¹² European Commission website, *Shaping Europe's Digital Future – Europe's Digital Decade*. [Europe's Digital Decade | Shaping Europe's digital future \(europa.eu\)](https://europa.eu)

¹³ Department of Enterprise, Trade & Employment, Government of Ireland (2022), *White Paper on Enterprise, 2022 - 2030*. [white-paper-on-enterprise-2022-2030.pdf](https://www.gov.ie)

2. AI & its Impact

2.1. Impact of AI - Changing our world

There is an increasing global acknowledgement of the deeply transformative potential of AI across societies and economies. AI is changing, and will continue to change, how we live and work, how our businesses and economies operate and in how we interact with our environment. AI has the potential to generate opportunities, create new value for all, as well as advance human endeavour in areas such as climate action, public health, education, housing, cultural heritage preservation, food security, human rights, crisis response and disaster management, and many others¹⁴.

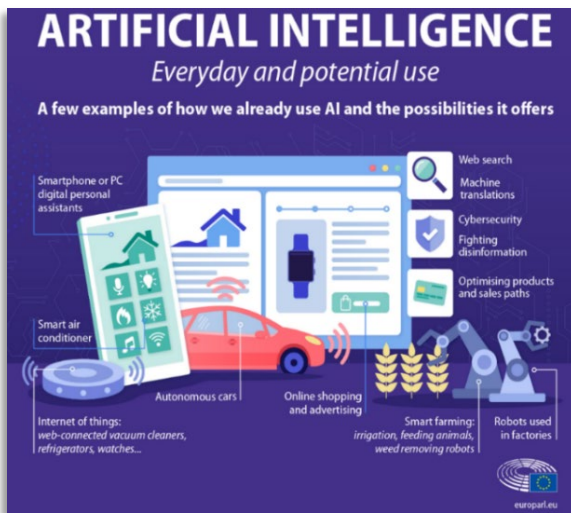


Figure 3: AI in Everyday Use¹⁵

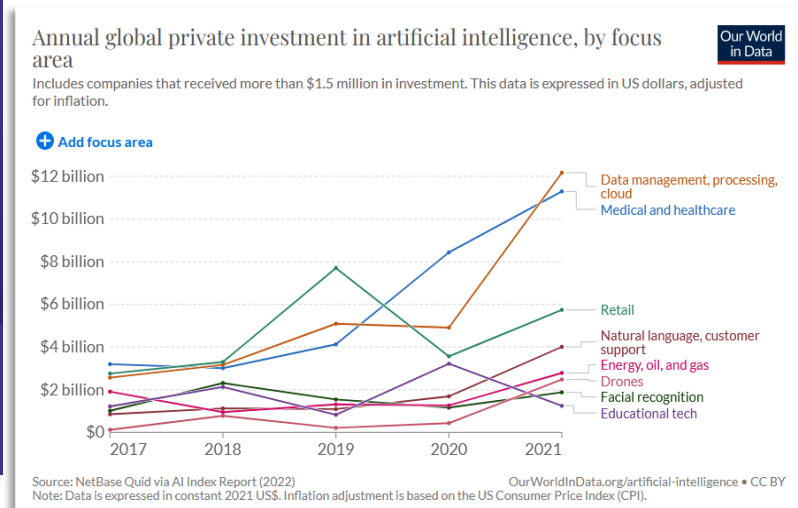


Figure 4: Annual Global Private Investment in AI presented by focus area¹⁶

From an economic perspective, AI is heralded as a driving force of productivity and economic growth. It has the potential to revolutionise productive activities through increasing efficiency, enabling more evidence-based data-driven decision-making, enhancing new products and service design¹⁷. Undoubtedly, as we advance into the 21st Century, AI is lining up to play a significant role in shaping global competitiveness and productivity, conferring strategic advantage on early adopters, whether they are businesses, industries, citizens or Governments¹⁸. Indeed, the extent of global private investment in AI, as per Figure 4, is evidence of this.

Regarding the global economic impact of AI, by 2035, it is estimated that the use of AI could double annual global economic growth rates. It is envisaged that AI adoption will achieve this growth in three different ways through–

- labour productivity increase due to greater workforce efficiency due to innovative technologies;
- generating a new virtual workforce with the capability of self-learning and solving problems;
- diffusion of innovation with widespread impact across different sectors, thereby creating new value and revenue opportunities¹⁹.

2.2. Impact of AI for Ireland

As outlined in Chapter 1, Ireland's national AI strategy *AI - Here for Good: National Artificial Intelligence Strategy for Ireland*²⁰ sets out a clear vision for Ireland to become an international leader in using AI for the benefit of people in Ireland, through a people-centred, ethical approach to AI development, adoption and use. It

¹⁴ Department of Enterprise, Trade & Employment, Government of Ireland (2021), *AI - Here for Good: National Artificial Intelligence Strategy for Ireland*. [AI - Here for Good: National Artificial Intelligence Strategy for Ireland - DETE \(enterprise.gov.ie\)](#)

¹⁵ European Parliament website (2021), *What is artificial intelligence and how is it used?* [What is artificial intelligence and how is it used? | News | European Parliament \(europa.eu\)](#)

¹⁶ University of Oxford, Our World in Data (2021), [Annual global private investment in artificial intelligence, by focus area \(ourworldindata.org\)](#)

¹⁷ European Parliament (2019), *Economic impacts of artificial intelligence*. [Economic impacts of artificial intelligence \(europa.eu\) referencing other research](#)

¹⁸ Department of Enterprise, Trade & Employment, Government of Ireland (2021), *AI - Here for Good: National Artificial Intelligence Strategy for Ireland*. [AI - Here for Good: National Artificial Intelligence Strategy for Ireland - DETE \(enterprise.gov.ie\)](#)

¹⁹ European Parliament (2019), *Economic impacts of artificial intelligence*. [Economic impacts of artificial intelligence \(europa.eu\) referencing other research](#)

²⁰ Department of Enterprise, Trade & Employment, Government of Ireland (2021), *AI - Here for Good: National Artificial Intelligence Strategy for Ireland*. [AI - Here for Good: National Artificial Intelligence Strategy for Ireland - DETE \(enterprise.gov.ie\)](#)

recognises that Ireland is well-placed to be at the forefront of AI's transformative change in light of our ongoing commitment to developing IT talent, entrepreneurship and connectivity. The National AI Strategy calls out the key role of Government in facilitating and enabling AI in Ireland. It also recognises that AI is a journey involving all of society, and commits to an AI approach which is responsible, ethical and trustworthy, enabling AI to be embedded in society in ways that respect and promote diversity, inclusion, equality and non-discrimination.



Ireland has a vibrant ICT ecosystem, particularly in AI, comprised of top international and indigenous industry players, leading ICT Research Development and Innovation (RDI) centres, four European Digital Innovation Hubs (EDIHs)²¹ including UCD's CeADAR which will focus on AI, supporting Government policy. In terms of the potential economic benefits of AI for Ireland, PwC in its 2017 report on the *Economic Impact of AI on Ireland's Economy*²², concluded that AI presents a substantial commercial and economic opportunity.

Figure 5: Estimated economic impact of AI in Ireland by 2030²³

What is clear is that Irish industry and the RDI sector are already embracing digitalisation and AI. Given the pervasiveness of the digital transformation across our economy and society, there are a broad range of framework conditions to support an inclusive and sustainable transition including: trust, security, connectivity, data privacy and digital literacy.

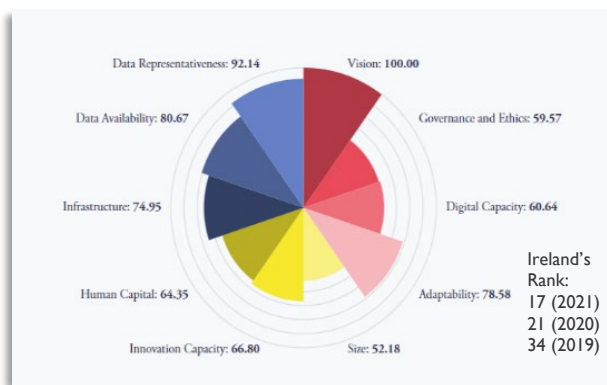


Figure 6: Oxford Insights Government AI Readiness 2021 Index²⁴

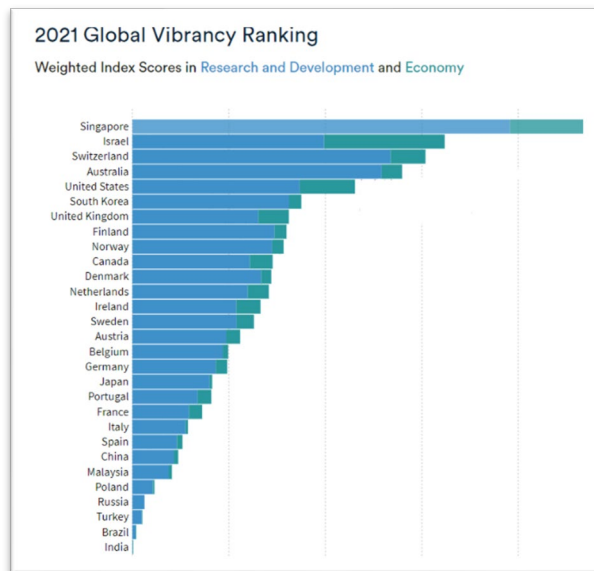


Figure 7: Ireland's ranking per capita, overall Global AI vibrancy²⁵.

²¹ CeADAR, which is led by EI/IDA Technology Centre in Applied Data Analytics and Machine Intelligence based in UCD, will focus on AI transformation in SMEs and public service organisations, is currently undergoing EDIH designation. Ireland will have four European Digital Innovation Hubs including: Data2Sustain, FactoryxChange, ENTIRE.

²² PwC Ireland Artificial Intelligence Report (2017), *The economic impact of artificial intelligence on Ireland's economy*. [The economic impact of artificial intelligence on Ireland's economy \(pwc.ie\)](https://www.pwc.ie)

²³ PwC Ireland Artificial Intelligence Report (2017), *The economic impact of artificial intelligence on Ireland's economy*. [The economic impact of artificial intelligence on Ireland's economy \(pwc.ie\)](https://www.pwc.ie)

²⁴ Oxford Insights, *Government AI Readiness Index 2021*. [Government AI Readiness Index 2021 — Oxford Insights](https://www.oxfordinsights.com)

²⁵ Stanford University Human-Centred AI (2022), *Global AI Vibrancy Tool* [Global AI Vibrancy Tool \(stanford.edu\)](https://stanford.edu)

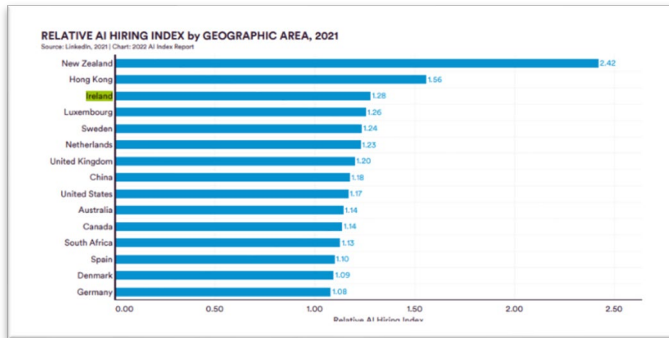


Figure 8: AI Hiring Index by Country, 2021²⁶

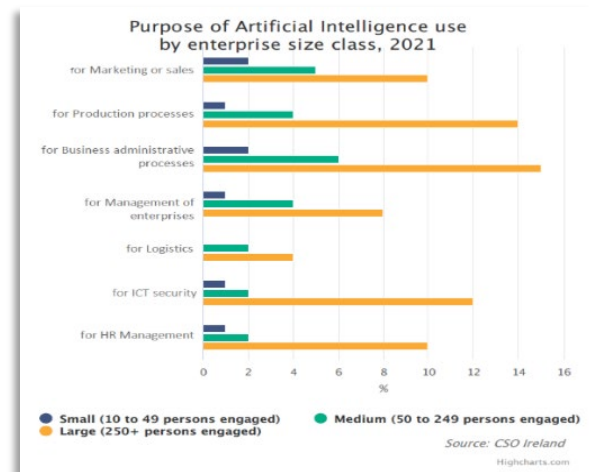


Figure 9: Purpose of AI use by Irish enterprises of different size classes²⁷

The Oxford Government AI Readiness Index²⁸ (Figure 6) ranks 160 countries by how prepared their governments are to use AI in public services. The ranking is based on 42 indicators across three pillars: Government; Technology Sector; and Data and Infrastructure. Ireland has been progressively climbing the rankings and by 2021 was ranked 17th overall.

With regard to vibrancy of Irish R&D in the area of AI (Figure 7), based on 2021 data, the AI Index Report 2022 ranks Ireland fifth of 28 countries (per capita) in terms of the Numbers of AI Conference Publications and AI Conference Citations and 14th in terms of Numbers of AI Journal Publications, with the number of AI Journal Publications nearly doubling from 315 in 2017 to 597 in 2021²⁹.

While there is the potential for AI adoption to impact on work, it is envisaged that AI will lead to new job creation, higher productivity and incomes. Evidence already shows that Irish businesses are looking to the future and hiring for AI. The *AI Index Report* (Figure 8) shows that Ireland is third in the rate of its AI hiring growth, in the period from 2016 to 2021³⁰.

This is consistent with the extent to which there is uptake and use of AI across Irish businesses. CSO data from 2021 (Figure 9) show that one in 12 enterprises in Ireland utilise AI³¹, and AI is being deployed across a wide variety of purposes.

²⁶ Stanford University Human-Centred AI (2022), *AI Index Report* [AI Index Report 2022 2022-AI-Index-Report_Master.pdf \(stanford.edu\)](#)

²⁷ Central Statistics Office, Government of Ireland (2021), *Information Society Statistics Enterprises 2021*. [Artificial Intelligence - CSO - Central Statistics Office](#)

²⁸ Oxford Insights, *Government AI Readiness Index 2021*. [Government AI Readiness Index 2021 — Oxford Insights](#)

²⁹ Stanford University Human-Centred AI (2022), *Global AI Vibrancy Tool* [Global AI Vibrancy Tool \(stanford.edu\)](#)

³⁰ Stanford University Human-Centred AI (2022), *AI Index Report* [AI Index Report 2022 2022-AI-Index-Report_Master.pdf \(stanford.edu\)](#)

³¹ Central Statistics Office, Government of Ireland (2021), *Information Society Statistics Enterprises 2021*. [Artificial Intelligence - CSO - Central Statistics Office](#)

3. Deliberations of the Top Team on Standards in AI

This paper seeks to concisely set out the Top Team on Standards in AI consultative process deliberations. The deliberations and discussions of the AI Top Team were coherent with, and seek to build on, the priorities of the *National AI Strategy* and Ireland’s digital strategy for enterprise³².

In compiling this paper, the Top Team’s discussions have been aligned to the National AI Strategy strands, so as to underpin and support the ongoing implementation of those national AI strategic priorities. The outputs of the Top Team deliberations have been categorised under four headings as follows:

- AI Policy & Regulation deliberations aligned to Strand 2 of the National AI Strategy – *A Governance Ecosystem that promotes Trustworthy AI*;
- AI Education, Skills & Careers, and AI RDI deliberations aligned to Strands 5 & 6 of the National AI Strategy – *A strong AI Innovation Ecosystem & AI Education, Skills & Talent*;
- AI in Irish enterprise deliberations aligned to Strand 3 of the National AI Strategy – *Driving Adoption of AI in Irish Enterprise*;
- AI Testing and Data deliberations aligned to Strand 7 of the National AI Strategy – *Supportive & Secure Infrastructure for AI*.

National AI Strategy Strand	AI Top Team Deliberation Theme
Strand 2: A Governance Ecosystem that promotes Trustworthy AI	AI Policy & Regulation
Strand 5: A Strong AI Innovation Ecosystem & Strand 6: AI Education, Skills & Talent	AI Education, Skills & Careers, and RDI
Strand 3: Driving Adoption of AI in Irish Enterprise	AI in Irish Enterprise
Strand 7: Supportive & Secure Infrastructure for AI	AI Testing & Data

Figure 10: AI Top Team Deliberation Themes aligned with *National AI Strategy*³³ Strand

In addition to this paper, the outputs of the Top Team on Standards in AI, have also been formulated into an AI Standards & Assurance Roadmap. The Roadmap is firmly situated within EU and international regulatory and standardisation developments. With regard to AI standardisation, European and international standardisation activities are at the core of Ireland’s AI Standards Roadmap and the EU AI Act sets the context for, and future of Ireland’s AI assurance regulatory model.

³² Department of Enterprise, Trade & Employment, Government of Ireland (2022), *White Paper on Enterprise, 2022 - 2030*. [white-paper-on-enterprise-2022-2030.pdf](#)

³³ Department of Enterprise, Trade & Employment, Government of Ireland (2021), *AI - Here for Good: National Artificial Intelligence Strategy for Ireland*. [AI - Here for Good: National Artificial Intelligence Strategy for Ireland - DETE \(enterprise.gov.ie\)](#)

3.1. AI Top Team Deliberations supporting the National AI Strategy, Strand 2: A Governance Ecosystem that promotes Trustworthy AI

Ireland has a clear digital policy trajectory with the *Digital Ireland Framework*³⁴, and in the area of AI in particular, with *AI – Here for Good, National Artificial Intelligence Strategy for Ireland*³⁵. Through these policies, Government has set out a course regarding how Ireland will achieve its objectives of leading the way internationally in terms of being an economic digital leader and in using AI to benefit our economy and society.

Ireland is uniquely positioned to realise these objectives, due to its membership of the EU, its close ties with other English-speaking countries, its base of multi-national corporations, its vibrant and innovative SME sector particularly in technology, and a highly skilled workforce. These factors provide a foundation upon which to strengthen and promote Ireland’s global position, attractiveness and reputation in relation to AI and the wider Digital economy.

The Top Team deliberations welcomed developments in Government AI and digital policy, and noted that–

- the continued prioritisation of AI strategic policy objectives and implementation of the **National AI Strategy** enables the ongoing evolution of national AI policy having regard to emerging innovation, global AI developments and learning from the experiences of other countries,
- the commitment of Government through the *Harnessing Digital - The Digital Ireland Framework*³⁶ and *AI - Here for Good: National Artificial Intelligence Strategy for Ireland*³⁷ continues to **strengthen and promote Ireland's international position and branding** in relation to AI and the wider Digital Economy,
- as the **EU AI Act** is now nearing the conclusion of the EU legislative process, developing the national **institutional regulatory structures** will be key to promoting trust in AI, minimising the capacity of AI systems to cause harm and strengthening Ireland's position to attract and develop AI industry,
- Ireland continues to **maximise its influence** on the EU AI regulatory regime which is shaping the future of the AI industry in Ireland, Europe and globally. The National AI Strategy provides policy direction for: Ireland’s future in AI; engagement at EU level in terms of policy and legislation; and for EU and international standardisation,
- the imminent regulation of AI is new, nuanced and complex. The *National AI Strategy* recognises that Irish SMEs are adopting AI into their existing business models and operations to improve competitiveness and product development and optimise business processes. For Irish businesses (especially SMEs) to successfully adapt to, and implement, the new EU AI Act regulatory regime, it is important that their needs are understood, and that there are comprehensive freely available guidance, practical tools and supports available to promote **understanding of, and facilitate compliance with, the EU AI Act**, associated legislation and how the Act fits within wider regulatory frameworks and ethics. Useful guidance and tools would address *inter alia* the scope of AI systems covered; responsibilities of different entities; risk categorisation; developing and using AI technology to tackle biases and inequalities; as well as appropriate and accessible information to users and the public,
- the new Proposal for a Directive on adapting non-contractual civil liability rules to artificial intelligence (**EU AI Liability Directive**) was published in September 2022. In the context of implementing that Directive, the Top Team considered that there would be a value in providing clarity on complaints procedures and redress options for natural persons affected or harmed by AI, as such mechanisms have the potential to alleviate pressure on responsible parties, enable transferable learnings between incidents and from other jurisdictions and avoid the perpetuation of harm,

³⁴ Government of Ireland (2019), *Future Jobs Ireland 2019, Preparing Now for Tomorrow’s Future*. [Future Jobs FINAL FINAL.pdf \(enterprise.gov.ie\)](#)

³⁵ Department of Enterprise, Trade & Employment, Government of Ireland (2021), *AI - Here for Good: National Artificial Intelligence Strategy for Ireland*. [AI - Here for Good: National Artificial Intelligence Strategy for Ireland - DETE \(enterprise.gov.ie\)](#)

³⁶ Government of Ireland (2019), *Future Jobs Ireland 2019, Preparing Now for Tomorrow’s Future*. [Future Jobs FINAL FINAL.pdf \(enterprise.gov.ie\)](#)

³⁷ Department of Enterprise, Trade & Employment, Government of Ireland (2021), *AI - Here for Good: National Artificial Intelligence Strategy for Ireland*. [AI - Here for Good: National Artificial Intelligence Strategy for Ireland - DETE \(enterprise.gov.ie\)](#)

- based on learning from other countries, a single focal point (or one-stop-shop) is of value, to progress the national AI agenda and initiatives, and support implementation of the National AI Strategy.

3.2. AI Top Team Deliberations supporting the National AI Strategy, Strand 5: A Strong AI Innovation Ecosystem and Strand 6: AI Education, Skills & Talent

The National AI Strategy enshrines the importance of developing AI and digital education, skills and talent, as well as enhancing and retaining such talent in Ireland, so that, as a country, Ireland has a skilled and capable workforce to enable our leading place in the development, deployment and adoption of AI.

Research, development and innovation in digital technologies are bringing a step change in the way we design, produce, commercialise and create value from all types of goods and relevant services. In the *National AI Strategy*³⁸, the *White Paper on Enterprise 2022 to 2030*³⁹ and *Impact 2030: Ireland's Research & Innovation Strategy*⁴⁰ there is a coherent focus on the enabling environment to support a strong Irish RDI ecosystem. These strategies also seek to maximise the contribution of the RDI sector to Ireland's digital transformation and embed collaboration between researchers and businesses to accelerate commercialisation.

The Top Team deliberations cohered with ongoing initiatives to support digital RDI, as well as AI skills development, including–

- the successful implementation of the *National AI Skills Report (May 2022)*⁴¹ in terms of skills-needs, competencies and transferrable skills to support **AI development and AI-related careers** required to serve Irish business community needs, and the successful implementation of the *Digital Ireland Framework (Feb 2022)*⁴² in driving the wider development of skills and workforce planning for the digital transition,
- supporting the higher education sector in developing home-grown **AI talent** to meet Irish industry needs,
- the development of **formal and professional expertise, skills competencies and training pathways** across all appropriate areas of the AI ecosystem (including Third Level programmes dedicated to developing distinct AI expertise such as AI Data Scientist, AI Data Analyst, AI Data Engineer), and importantly also, the development of complementary hybrid skills including AI/Data standards, ethics, law (including human rights, economic and social policy) and regulatory skills to support ethical and compliant AI innovation and implementation,
- the importance of **professionalism and ethical competencies in AI careers** particularly and ICT careers generally. In this regard a European e-Competence Framework Standard I.S. EN 16234-1:2019 has been developed providing a Common European Framework for ICT Professionals in all sectors⁴³,
- driving world class **research and development in AI** and fostering a vibrant AI RDI sector that harnesses Ireland's capabilities and strengths, including through commissioning and supporting local AI research that addresses Irish-specific needs, AI adoption across the Irish public sector, and AI Standards and Assurance activities including risk mitigation,
- encouraging strong **collaboration between the RDI community and industry**, especially SMEs, to connect innovative researchers, enterprises and entrepreneurs that are involved in developing and using AI, including through–

³⁸ Department of Enterprise, Trade & Employment, Government of Ireland (2021), *AI - Here for Good: National Artificial Intelligence Strategy for Ireland. AI - Here for Good: National Artificial Intelligence Strategy for Ireland - DETE (enterprise.gov.ie)*

³⁹ Department of Enterprise, Trade & Employment, Government of Ireland (2022), *White Paper on Enterprise, 2022 - 2030. white-paper-on-enterprise-2022-2030.pdf*

⁴⁰ Department of Further & Higher Education, Research, Innovation & Science, Government of Ireland (2022), *Impact 2030: Ireland's Research and Innovation Strategy. gov.ie - Impact 2030: Ireland's Research and Innovation Strategy (www.gov.ie)*

⁴¹ Department of Enterprise, Trade & Employment, Government of Ireland (2021), *AI - Here for Good: National Artificial Intelligence Strategy for Ireland. AI - Here for Good: National Artificial Intelligence Strategy for Ireland - DETE (enterprise.gov.ie)*

⁴² Department of the Taoiseach, Government of Ireland (2022), *Harnessing Digital - The Digital Ireland Framework. gov.ie - Harnessing Digital - The Digital Ireland Framework (www.gov.ie)*

⁴³ I.S. EN 16234-1:2019 e-Competence Framework (e-CF) - A common European Framework for ICT Professionals in all sectors - Part 1: Framework. [I.S. EN 16234-1:2019 e-Competence Framework \(e-CF\) - A common Eur \(standards.iee.eu\)](https://standards.iee.eu/en/16234-1-2019-e-competence-framework-e-cf-a-common-eur/)

- Digital Innovations Hubs, sandboxes and technology centres/gateways,
 - supporting commercial spin offs from Third Level institutions and SMEs /start-ups to scale up their product or service as well as their operations, to be commercially viable, and
 - SFI’s establishment of research and innovation hubs for industry and academic engagement across the regions⁴⁴,
- seeking out **opportunities to publicise Irish AI use case success stories** (e.g. AI Challenge) or other initiatives to incentivise collaboration between the best and brightest in Ireland and abroad. Such initiatives have the potential to enhance Ireland’s reputation, encourage innovation and investment and build trust, acceptance and engagement with AI.

3.3. AI Top Team Deliberations supporting the National AI Strategy, Strand 3: Driving Adoption of AI in Irish Enterprise

AI presents significant opportunities for Irish Enterprise. Ireland has a vibrant ICT ecosystem, particularly in AI, comprised of top international and indigenous industry players, leading ICT Research Development and Innovation (RDI) centres.

The Top Team discussions strongly aligned with Strand 3 of the *National AI Strategy* concerned with driving adoption of AI in Irish enterprise, and the importance of AI to: transform the Irish economy; rethink business models to reap productivity gains; and create new areas of growth. Building on this, the Top Team process–

- acknowledged the establishment of the new **European Digital Innovation Hubs** (EDIHs)⁴⁵, as one-stop-shops supporting companies (particularly SMEs) and public sector organisations in responding to digital challenges. The Top Team noted, in particular, the designation of a **national AI Digital Innovation Hub**, in line with the *National AI Strategy*, namely CeADAR. CeADAR will provide Irish businesses with a comprehensive service in all aspects of innovation and applied R&D in AI, Machine Learning and Data Analytics⁴⁶. To maximise the opportunities that AI presents for Irish industry, CeADAR will play a central role in embedding a vibrant AI networking ecosystem to support businesses in adapting to the developing technology, building collaborations across industry, including with research entities, other start-ups/SMEs and enabling the strengthening of Ireland’s reputation and position globally,
- considered that there would be a critical advantage in the **national AI Digital Innovation Hub** having the capacity, remit, resourcing and profile to provide–
 - AI-specific support services, including tools, guidance and training for enterprises and public sector users regarding the AI journey and its regulation, including signposting enterprises to expert legal services,
 - guidance on the development and use of AI technology throughout the AI system’s lifecycle in an ethical, unbiased and safe manner,
 - market readiness guidance and support for SMEs on moving from Technology Readiness Level (TRL) 6 to TRL 8 and beyond, in deploying their AI products and services at scale,
 - Data/AI maturity assessment capability enabling industry, especially SMEs, to understand how AI can most effectively enable their business and where to build capacity in the area of AI,
 - acting as a dedicated communication channel particularly for SMEs and other AI innovators, as envisaged by Art 55⁴⁷ of the EU AI Act,
- considered that SMEs, in particular, will have **AI-specific needs** including: how AI can add value to an enterprise’s business pipeline; **advisory and mentoring supports in terms of building AI expertise** as well as attracting and retaining high value staff with AI capability,

⁴⁴ Science Foundation Ireland (2021), *Shaping Our Future, Science Foundation Ireland Strategy 2025*. <https://www.sfi.ie/strategy/SFI-Strategy-2025.pdf>

⁴⁵ The EDIHs will deliver technical expertise and testing services, provide innovation services, such as financing advice, training, and skills development, and assist companies in tackling environmental issues, in particular through the use of digital technologies. European Commission website, *Shaping Europe’s Digital Future – European Digital Innovation Hubs*. [European Digital Innovation Hubs | Shaping Europe’s digital future \(europa.eu\)](https://ec.europa.eu/digital-single-market/en/european-digital-innovation-hubs)

⁴⁶ CeADAR, Ireland’s Centre for applied AI website. [Homepage - CeADAR](https://ceadar.ie/)

⁴⁷ With regard to SMEs in particular, Art 55 of the EU AI Act, when adopted, will require Member States to implement specific measures to support SMEs including: providing priority access to AI regulatory sandboxes; raising awareness of the application of the Act; providing a dedicated SME communication channel for guidance; and setting conformity assessment fees proportionately to SME size & market.

- aligned with the *White Paper on Enterprise 2022 – 2030*⁴⁸ regarding the need for Government supports to facilitate many Irish enterprises in their digital transition through the use of existing Funds and creating an ecosystem that accelerates start-up growth and scaling, including: access to funding both public and private; investment in R&D and innovation; and a tax system that encourages investment in start-ups and scaling. In particular, the Top Team highlighted the value of–
 - supporting **market readiness** by enhancing **funding** at higher Technology Readiness Levels (TRLs),
 - maximising awareness, utility, design and uptake of existing Funds which make Ireland attractive to the knowledge industry in Ireland to improve accessibility of these Funds, including to SMEs (e.g. Disruptive Technology Innovation Fund⁴⁹, Knowledge Development Box tax relief⁵⁰, capital gains tax reliefs, and R&D Tax credit),
- recognised that, as per the *White Paper on Enterprise 2022 - 2030*⁵¹, a **supportive regime** including **intellectual property** is one of the requirements integral to stepping up innovation in Irish enterprise and observed that there are opportunities to continue to create awareness across Irish businesses of supports and advice available from: Knowledge Transfer Ireland (KTI); Intellectual Property Office of Ireland (IPOI); Technology Transfer Offices and industrial liaison offices in HEIs and research organisations. International Standards such as ISO 56000 on Innovation Management also have the potential to support Irish businesses, including I.S. EN ISO 56005:2020⁵² which provides a guidance framework for businesses in effectively managing IP as well as supporting and protecting innovations.

3.4. AI Top Team Deliberations supporting the National AI Strategy, Strand 7: Supportive & Secure Infrastructure for AI

In response to the dynamic and transformative nature of AI as a technology, more agile approaches are being sought to support innovation within regulatory frameworks. Increasingly, regulatory sandboxes and testbeds are being deployed across regulated sectors, but especially in the high-tech sector, to enable experimental innovation within a framework of controlled risks and supervision⁵³.

Establishment of AI regulatory sandboxes⁵⁴ are part of the measures included in the EU AI Act to ensure that the regulatory framework is innovation-friendly, future-proof and resilient to disruption. They are intended to facilitate the development and testing of innovative AI systems with regulatory oversight. For innovators, especially SMEs, regulatory sandboxes enable them to develop products and services in a regulation-compliant way, develop a better understanding of regulatory expectations, mitigate risks and unintended consequence and reduce time to market⁵⁵. The benefits for regulators are that they can acquire a better understanding of the innovative products, which allows them to develop more appropriate rule-making, supervision and enforcement policies and ultimately provide greater assurance to the public regarding the safety of products and services.

Building on the strategic action contained in the *National AI Strategy*, the Top Team process observed–

- the importance of Irish start-ups, SMEs, multinational corporations and public sector bodies having fair **access to regulatory sandboxes and testbeds in the Irish AI ecosystem** to perform product and service development testing and trials. The Top Team noted the value of incorporating AI into domain-specific sandboxes in other regulatory regimes e.g. fintech. An AI regulatory sandbox pilot, as envisaged in the EU AI Act, is currently being undertaken through a joint initiative of the Government of Spain and

⁴⁸ Department of Enterprise, Trade & Employment, Government of Ireland (2022), *White Paper on Enterprise, 2022 - 2030*. [white-paper-on-enterprise-2022-2030.pdf](https://enterprise.gov.ie/en/white-paper-on-enterprise-2022-2030.pdf)

⁴⁹ Department of Enterprise, Trade & Employment website, *Disruptive Technologies Innovation Fund*. <https://enterprise.gov.ie/en/what-we-do/innovation-research-development/disruptive-technologies-innovation-fund/>

⁵⁰ Revenue, Irish Tax and Customs website, *Knowledge Development Box (KDB)*: [Knowledge Development Box \(KDB\) \(revenue.ie\)](https://revenue.ie/en/knowledge-development-box/)

⁵¹ Department of Enterprise, Trade & Employment, Government of Ireland (2022), *White Paper on Enterprise, 2022 - 2030*. [white-paper-on-enterprise-2022-2030.pdf](https://enterprise.gov.ie/en/white-paper-on-enterprise-2022-2030.pdf)

⁵² [I.S. EN ISO 56005:2021 Innovation management - Tools and methods \(standards.ie\)](https://www.iso.org/standard/72421.html)

⁵³ European Parliament (2022), *Artificial intelligence act and regulatory sandboxes*. [Artificial intelligence act and regulatory sandboxes \(europa.eu\)](https://www.europa.eu/artificial-intelligence-act-and-regulatory-sandboxes)

⁵⁴ EU AI Act Proposal at Art 53

⁵⁵ European Parliament (2022), *Artificial intelligence act and regulatory sandboxes*. [Artificial intelligence act and regulatory sandboxes \(europa.eu\)](https://www.europa.eu/artificial-intelligence-act-and-regulatory-sandboxes)

the European Commission⁵⁶. This will provide a valuable learning opportunity for Ireland to aid consideration of a regulatory sandbox for Ireland,

- that **high data quality** is critical for the performance of many AI systems especially in techniques which involve the training of models with data. This is particularly important in ensuring that high-risk AI systems perform safely and as intended. Robust data governance and management practices, as well as high quality training, validation and testing of data sets are mandated by the EU AI Act and fundamentally underpin effective AI systems and their regulation. Furthermore, the *European Strategy for Data*⁵⁷ seeks to establish European common data spaces to facilitate data sharing between businesses and with governments, in the public interest for the benefit of the economy and society. Such data sharing will be instrumental in providing trusted, accountable and non-discriminatory access to high quality data for the training, validation and testing of AI systems,
- the need for strong awareness across Irish organisations of the criticality of robust data governance, including compliance with legislative requirements and conformance with standards. Additionally, there are opportunities for Ireland to continue to augment the **sharing of data** through enhancing access to open public data, as well as promoting and supporting the formation of data repositories, and
- the dependence of AI adoption on digital transformation, in line with the *Digital Ireland Framework*, and the need for a continued focus on supporting the **digitalisation** of traditionally non-tech sectors.

⁵⁶ European Commission website, *Launch event for the Spanish Regulatory Sandbox on Artificial Intelligence (2022)*. [Launch event for the Spanish Regulatory Sandbox on Artificial Intelligence | Shaping Europe's digital future \(europa.eu\)](#)

⁵⁷ European Commission website, *A European Strategy for data*. [A European Strategy for data | Shaping Europe's digital future \(europa.eu\)](#)

Annex A: Top Team on AI Contributors

Top Team on Standards in AI: Participants

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Noleen Campbell	Irish companies & SMEs	Joanne Clarke	Business support
Paul Killeen	Research & academia	Marita Kinsella	Compilation
Barry Smith	Multi-national companies		

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