

TOP TEAM ON STANDARDS IN AI

# AI Standards & Assurance Roadmap

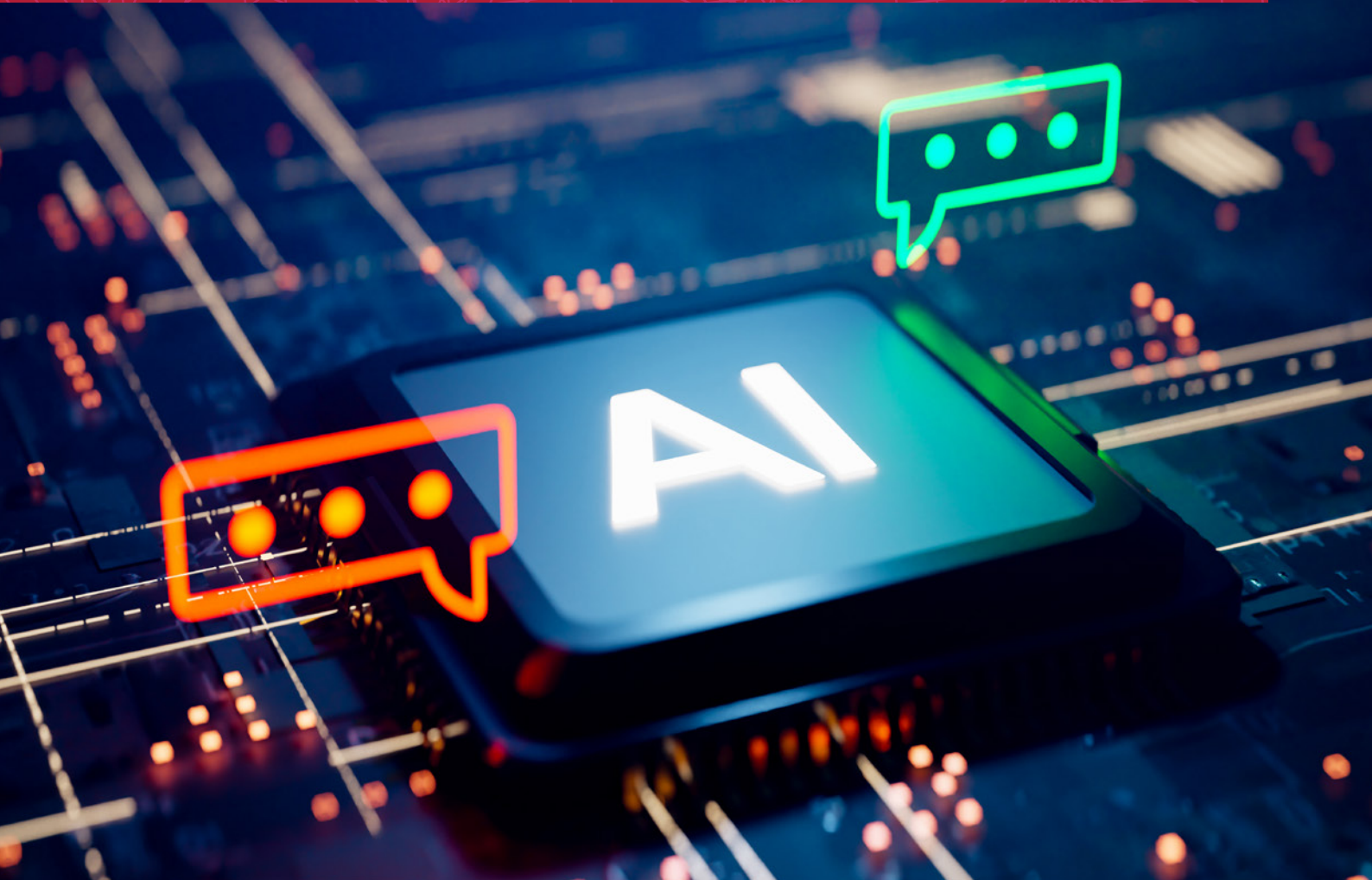
Action under 'AI – Here for Good,' the National Artificial Intelligence Strategy for Ireland



**NSAI**



Rialtas na hÉireann  
Government of Ireland





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## Acknowledgements

This AI Standards & Assurance Roadmap is a collaborative effort based on input from many stakeholders and experts from across the Irish AI community, including: Irish academia; multinational corporations and large-scale information technology industry; experts from Irish AI start-ups and small successful enterprises; legal experts from within the Irish technology industry and specialist Irish law firms. The deliberations of the Top Team on Standards in AI have been formulated into two outputs–

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

NSAI wishes to recognise and express its sincere thanks to all of the participants of the Top Team on Standards in AI (listed in Annex A) who voluntarily provided their time and expertise in contributing to the Top Team, through their participation and input into the process.

## About the NSAI

The National Standards Authority of Ireland (NSAI) is the national standards body for Ireland and works to ensure a safer, better and more sustainable future. Established under the National Standards Authority of Ireland Act, 1996, for over 25 years, the NSAI has been providing standardisation, certification and measurement services on behalf of the State.

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## NSAI CEO Foreward

It gives me great pleasure to present this Roadmap on AI Standards and Assurance as one of the key deliverables of Ireland's National AI Strategy, *AI - Here for Good: National Artificial Intelligence Strategy for Ireland*. This Roadmap is also a significant milestone on the NSAI's road to delivering on its own Strategic Plan 2022 – 2026: *Innovating to shape a safer, better, and sustainable future*.

Developed, building from the Top Team on Standards in AI engagement process, this Roadmap consists of a set of actions to advance the development of AI Standards and Assurance requirements within Ireland, to support our national preparations for implementing the forthcoming EU AI Act.

There is no doubt that AI is heralded as one of the transformative technologies of our time. AI is changing how we live and work, how our businesses and economies operate and how we interact with our environment. The NSAI's Strategic Plan places a clear focus on how we can enhance our services to support Irish enterprises in the digital transformation journey that lies ahead. As an organisation, we are committed to enhancing NSAI's role in enabling Irish businesses to embrace AI as part of that transformation journey.

Central to Ireland's National AI Strategy is that, as a country, we harness AI as a force for good and maximise its potential to generate opportunities, create new value for all, and provide new innovative solutions to many complex economic and social challenges. The forthcoming EU AI Act will establish a robust regulatory structure that will provide assurance to the public, to businesses and organisations that AI is an ethical, trustworthy and safe technology.

Harmonised European AI Standards and Conformity Assessment are central to the EU AI regulatory model and are key tools in providing clarity for Irish industry and assurance to the public on regulatory compliance. New AI Standards are at an advanced stage at EU and international levels, and through NSAI, experts from the Irish AI community are playing leading roles internationally in developing these standards. These AI Standards are building trust in AI, enabling trade, ensuring interoperability, and promoting a common vision of trustworthy AI systems. Key Standards actions in this Roadmap focus on maximising the participation and influence of the Irish AI expert community and stakeholders in international AI standards development.

The Assurance Actions in this Roadmap identify a critical way in which NSAI can deliver on its digital transformation strategic objective, namely that NSAI is commencing preparations to seek designation as an AI notified body and to rollout certification schemes to support Irish businesses. The new AI conformity assessment model as part of the EU AI Act will require organisations that develop and deploy AI technologies to demonstrate conformity. For high-risk AI systems this will be demonstrated through the conformity assessment work of notified bodies. It is strategically important for Ireland, and a vital support for Irish businesses, that Ireland has its own notified body for AI.

I want to extend my sincere thanks and appreciation to the Top Team on Standards in AI and all collaborators for their contribution to this process. Leading AI experts from across Irish industry, academia, civil society, the private and public sectors voluntarily gave their time and expertise to engage with NSAI.

Finally, as NSAI now moves to the next phase in implementing this Roadmap, we look forward to continuing engagement with Ireland's expert and vibrant AI industry and community, as well as working closely across Government, with agencies, the standardisation community and a wide range of stakeholders as part of the process to successfully advance Ireland's ambition to embrace AI in a safe, ethical and trustworthy way.

Geraldine Larkin  
**Chief Executive Office**

# 1. Chapter 1: Introduction

“A computer would deserve to be called intelligent if it could deceive a human into believing that it was human.”<sup>1</sup>

## 1.1. What is AI?

While a definition of Artificial Intelligence (AI) with widespread acceptance has not yet emerged, Ireland’s national AI strategy: *AI - Here for Good, A National Artificial Intelligence Strategy for Ireland*<sup>2</sup> 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.”<sup>3</sup>

In reality, this means that 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 interpretation of the effects of previous activities<sup>4</sup>.

Though the far-reaches of what constitutes an AI system may be difficult to define, in the real world we use AI on a daily basis for countless activities, such as translating text, generating subtitles, filtering email spam, personalised shopping.

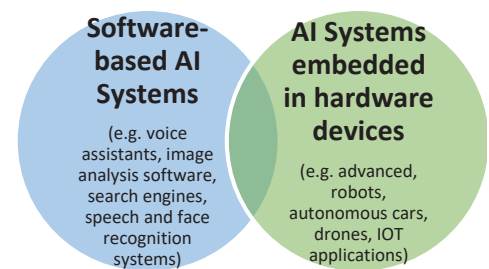


Figure 1: AI-based systems categories

AI-based systems are usually of two categories or a combination of both, as indicated in Figure 1.

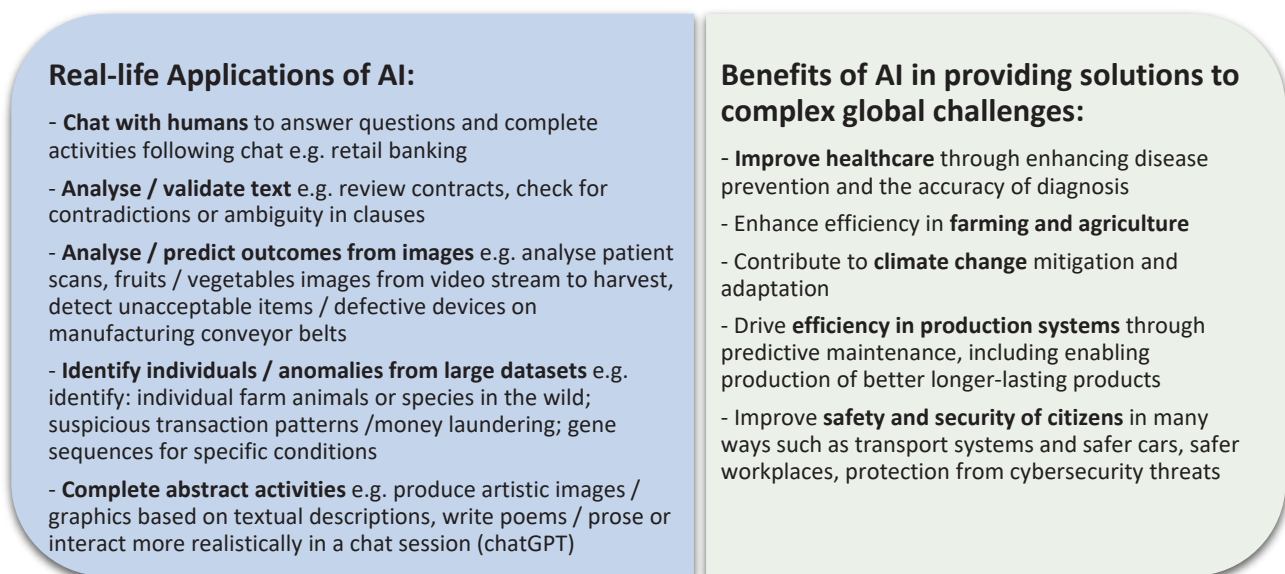


Figure 2: Real-life applications<sup>5</sup> and benefits of AI

<sup>1</sup> Alan Turing

<sup>2</sup> 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)*

<sup>3</sup> OECD Council Recommendation on Artificial Intelligence, OECD/Legal/0449, (adopted 22 May 2019). [OECD Legal Instruments](#)

<sup>4</sup> 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)*

<sup>5</sup> Note: A collection of AI use cases can be found in ISO/IEC TR 24030:2021 *Information technology — Artificial intelligence (AI) — Use cases. ISO - ISO/IEC TR 24030:2021 - Information technology — Artificial intelligence (AI) — Use cases*

## 1.2. Context of this Report

### 1.2.1. Irish Policy Context

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* in July 2021<sup>6</sup>. The Strategy outlines Ireland's ambition 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 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.

Central to the Strategy is Government's commitment to an ethical approach to AI and to the secure use of AI and other digital technologies. The Strategy emphasises that AI must be developed and used in a manner that assures trust, fairness, inclusivity, transparency and accountability. Its three core pillars are—

- Building public trust in AI,
- Leveraging AI for economic and societal benefit through adoption in Irish enterprises and AI deployment to serve the public, and
- Putting in place the enablers for AI such as a strong innovation ecosystem, education, skills and talent, and a secure infrastructure.



Hand-in-hand with the *AI - Here for Good*, in February 2022, the Department of An Taoiseach published *Harnessing Digital - The Digital Ireland Framework*<sup>7</sup> as a strategy to drive and enable the digital transition across Irish society and the economy. This national digital strategy sets out a pathway to support Ireland's goal 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*<sup>8</sup>, and complements work towards achieving Ireland's climate targets, and the twin green and digital transitions.

Furthermore, Ireland's recent *White Paper on Enterprise 2022 - 2030*<sup>9</sup>, published in December 2022, places digital transformation at the heart of Irish enterprise policy, recognising that AI and digital technologies will play a major role in shaping Ireland's global competitiveness and productivity over the coming decades, and will be essential drivers in economic growth and transitioning towards a more sustainable growth model.

### 1.2.2. EU Policy & Legislative Context

At EU level it is very much recognised that AI will shape the digital future of the Union, its citizens and industry. EU initiatives in AI have been on an advancing trajectory<sup>10</sup> since 2018 with the publication of the *Strategy on AI for Europe*<sup>11</sup>. In addition, a High-Level Expert Group on AI was set up by the European Commission in June 2018 and it went on to publish a number of documents regarding AI in the European

<sup>6</sup> 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)

<sup>7</sup> Department of the Taoiseach, Government of Ireland (2022), *Harnessing Digital - The Digital Ireland Framework*. [gov.ie](https://gov.ie) - [Harnessing Digital - The Digital Ireland Framework \(www.gov.ie\)](https://www.gov.ie)

<sup>8</sup> 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)

<sup>9</sup> 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)

<sup>10</sup> European Commission website, *Shaping Europe's Digital Future – A European approach to artificial intelligence*. <https://digital-strategy.ec.europa.eu/en/policies/european-approach-artificial-intelligence>

<sup>11</sup> European Commission Communication (2018), *Artificial Intelligence for Europe*, COM(2018) 237 final. [AI Communication \(europa.eu\)](https://europa.eu)

Union including *A definition of AI: Main Capabilities and Disciplines*<sup>12</sup>, *Ethics Guidelines for Trustworthy AI*<sup>13</sup>, *Policy and Investment Recommendations for Trustworthy AI*<sup>14</sup>.

Further key milestones on the EU's AI journey include publication of the *European Commission Coordinated Plan on AI* in December 2018<sup>15</sup>, updated in April 2021<sup>16</sup>. The Coordinated Plan sets out to: maximise the impact of investments at EU and national levels; encourage synergies and cooperation across the Union; foster the exchange of best practices; and ensure that Europe maximises its potential to compete globally.

In February 2020 the Commission published its *White Paper on AI: a European approach to excellence and trust*<sup>17</sup> which aims to promote Europe's AI innovation capacity (ecosystem of excellence), while supporting the development and uptake across the Union of ethical and trustworthy AI embedded in EU values and fundamental rights (ecosystem of trust).

In April 2021 the Commission published its AI Package which included a *Communication on fostering a European approach to AI*<sup>18</sup> and a *Proposal for a Regulation laying down harmonised rules on AI (commonly known as the EU AI Act)*<sup>19</sup>. This was followed by a further legislative proposal: the *Proposal for an AI Liability Directive*<sup>20</sup>, published in September 2022.

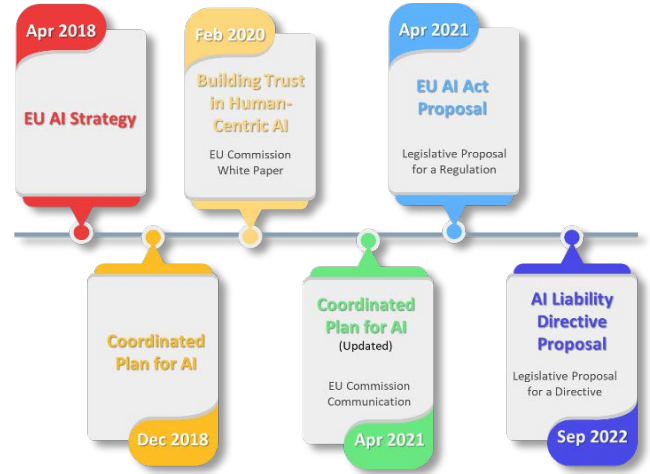


Figure 3: EU Policy & Legislative Timeline

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. This will be further discussed in Chapter 2. Several harmonised European standards are already under development to support compliance with the essential requirements of the EU AI Act and promote ethical and trustworthy AI aligned to EU values.

### 1.3. Top Team on Standards in AI

In March 2019, *Future Jobs Ireland, Preparing now for Tomorrow's Economy*<sup>21</sup> was published by the 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 future economic opportunities.

Embracing innovation and technological change formed a central pillar of *Future Jobs Ireland*. In addition, the establishment of Top Teams to realise opportunities presented by technological changes was called out as a key ambition. *Future Jobs Ireland* identified the establishment of a Top Team in Artificial Intelligence as a mechanism to enhance and exploit Ireland's capability in cutting edge technological areas, such as AI.

<sup>12</sup> EU Commission High Level Expert Group on AI, *A definition of AI: Main Capabilities and Disciplines* (2018). [ai-definition.pdf \(aepd.es\)](#)

<sup>13</sup> EU Commission High Level Expert Group on AI, *Ethics guidelines for trustworthy AI* (2019). [Ethics guidelines for trustworthy AI | Shaping Europe's digital future \(europa.eu\)](#)

<sup>14</sup> EU Commission High Level Expert Group on AI, *Policy and investment recommendations for trustworthy Artificial Intelligence* (2019). [Policy and investment recommendations for trustworthy Artificial Intelligence | Shaping Europe's digital future \(europa.eu\)](#)

<sup>15</sup> European Commission Communication (2018), *Coordinated Plan on Artificial Intelligence*, COM(2018) 795 final. [com\\_2018\\_795\\_f1\\_annex\\_en\\_v7\\_p1\\_1003549\\_519490C7-D1E9-E2EC-22ED4B4B54A77478\\_56017.pdf](#)

<sup>16</sup> European Commission website, *Coordinated Plan on Artificial Intelligence 2021 Review* (2021). [Coordinated Plan on Artificial Intelligence 2021 Review | Shaping Europe's digital future \(europa.eu\)](#)

<sup>17</sup> European Commission Communication (2020), *White Paper On Artificial Intelligence - A European approach to excellence and trust*, COM(2020) 65 final. [commission-white-paper-artificial-intelligence-feb2020\\_en.pdf \(europa.eu\)](#)

<sup>18</sup> European Commission Communication (2021), *Fostering a European approach to Artificial Intelligence (2021) COM(2021) 205 final*. [Communication on Fostering a European approach to Artificial Intelligence | Shaping Europe's digital future \(europa.eu\)](#)

<sup>19</sup> 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 \(europa.eu\)](#)

<sup>20</sup> European Commission website, *Liability Rules for Artificial Intelligence* (2022). [Liability Rules for Artificial Intelligence \(europa.eu\)](#)

<sup>21</sup> Government of Ireland (2019), *Future Jobs Ireland 2019, Preparing Now for Tomorrow's Future*. [Future Jobs FINAL FINAL.pdf \(enterprise.gov.ie\)](#)



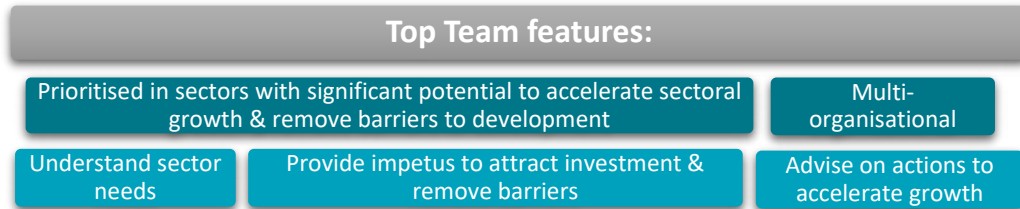


Figure 4: Future Jobs Ireland Strategy, features of a Top Team<sup>22</sup>

In 2020 NSAI was tasked by the Department of Enterprise, Trade and Employment with leading the Top Team on Standards in AI. The Top Team comprised leading experts in AI, with the expertise and skills to advise on AI and its adoption in Ireland. The Top Team included interested stakeholders across industry, academia, civil society, the private and public sectors.

Terms of Reference for the Top Team on Standards in AI were finalised by NSAI<sup>23</sup>. An interim report was prepared by NSAI in August 2020, outlining: European and national policy priorities for AI; Ireland's role in standardisation, and defining other important AI aspects. The interim report was used as a guidance by the Top Team on Standards in AI. The Top Team process engaged with a wide range of stakeholders to understand the state of play for 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 Roadmap.

In July 2021, the National AI Strategy tasked the Top Team on Standards in AI with publishing "*a Standards and Assurance Roadmap for AI*"<sup>24</sup>.

The NSAI team then used an iterative approach to formulate the outputs of the Top Team on Standards in AI, and this Roadmap derives from those outputs.



Figure 5: AI Standards & Assurance Roadmap Actions

<sup>22</sup> Government of Ireland (2019), *Future Jobs Ireland 2019, Preparing Now for Tomorrow's Future*. [Future Jobs FINAL FINAL.pdf \(enterprise.gov.ie\)](#)

<sup>23</sup> National Standards Authority of Ireland (2020), Top Teams Standards in AI, Terms of Reference.

<sup>24</sup> 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 \(enterprise.gov.ie\)](#) at page 9

## 2. Chapter 2: AI Regulatory Landscape

“Like the steam engine or electricity in the past, AI is transforming our world, our society and our industries.”<sup>25</sup>

### 2.1. Regulating AI, why & how?

AI has immense potential to be a significant force for good<sup>26</sup>. Understandably, there are concerns that there may be risks associated with AI, such as:

- impacts on labour markets;
- widening the gap between developed and emerging nations;
- the emergence of early AI adopter “super firms” as hubs of wealth and knowledge to the detriment of wider industry and economy;
- opaque decision-making, bias and the potential to intrude on personal privacy;
- use for criminal purposes<sup>27,28</sup>.

To safeguard against these potential risks and to ensure that the functionality of AI is maximised for good, there are a number of ongoing initiatives.

#### 2.1.1. Council of Europe draft convention on AI & human rights

One such initiative is the work of the Council of Europe through its Committee on AI (CAI), (preceded by CAHAI), to develop a draft convention on artificial intelligence and human rights. The purpose of this convention will be to ensure that human rights are respected. The convention also aims to ensure that democracy and the rule of law are central to the development and deployment of AI, while also fostering innovation. The convention draft<sup>29</sup> has now been made public and aligns with the direction of the EU AI Act.

#### 2.1.2. EU Proposal for a Regulation laying down harmonised rules on Artificial Intelligence (EU AI Act)

One of the most significant initiatives focussed on maximising the benefits of AI, while minimising risks, is the first ever legal framework for AI currently under development by the European Union. The EU is leading the way in terms of AI regulation globally.

As outlined above, in April 2021 the European Commission published the *Proposal for a Regulation laying down harmonised rules on Artificial Intelligence (commonly known as the EU AI Act)*<sup>30</sup>. A founding pillar of the European approach to AI and its regulation is trust; AI must be trustworthy and human-centric. Cohering with the new EU regulatory framework, Ireland’s *National AI Strategy* commits to ensuring that Ireland, both in national policies and through its contribution internationally, maximises the benefits of AI for the whole of society, while minimising associated risks<sup>31</sup>.

The EU AI Act seeks to adopt a proportionate and risk-based approach to the regulation of AI systems<sup>32</sup>. The Act aims to address risks of specific uses of AI, categorising them into 4 different levels and applying different regulatory requirements based on the risk categorisation. The obligations of the Act will apply to: entities

<sup>25</sup> European Commission Communication (2018), *Artificial Intelligence for Europe*, COM(2018) 237 final. [AI Communication \(europa.eu\)](#)

<sup>26</sup> 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 \(enterprise.gov.ie\)](#)

<sup>27</sup> European Parliament (2019), *Economic impacts of artificial intelligence*. [Economic impacts of artificial intelligence \(europa.eu\) referencing other research](#)

<sup>28</sup> 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 \(enterprise.gov.ie\)](#)

<sup>29</sup> Council of Europe, Committee on Artificial Intelligence (2023), *Revised Zero Draft [Framework] Convention on AI, Human Rights, Democracy and the Rule of Law*. [1680aa193f \(coe.int\)](#)

<sup>30</sup> European Commission website, *Shaping Europe’s digital future – Proposal for a Regulation laying down harmonised rules on artificial intelligence* (2021). [EU AI Act Explanatory Memorandum Proposal for a Regulation laying down harmonised rules on artificial intelligence | Shaping Europe’s digital future \(europa.eu\)](#)

<sup>31</sup> 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 \(enterprise.gov.ie\)](#)

<sup>32</sup> European Commission Communication (2021), *Fostering a European approach to Artificial Intelligence* (2021) COM(2021) 205 final. [EU Commission Communication: Fostering a European Approach to AI. resource.html \(europa.eu\)](#)



### 3. Chapter 3: AI Standards Landscape

*“Standards are the distilled wisdom of people with expertise in their subject matter.”<sup>35</sup>*

#### 3.1. What are standards and why are they important?

Standards are documents that provide requirements, specifications, guidelines or characteristics that can be used consistently to ensure that materials, products, processes and services are fit for their purpose. The purpose of standards in any sector is to ensure quality, safety and efficiency<sup>36</sup>. Standards also provide: assurance that products and services are trustworthy and predictable in behaviour; facilitate predictability in the costs of managing products and services; reduce post-market costs; improve interoperability; enhance innovation; and foster collaboration across the relevant sector or ecosystem.

Standards are created by bringing together all interested parties such as manufacturers, consumers, regulators, researchers and experts regarding a particular material, product, process or service. Standardisation is the process through which requirements and recommendations for products, processes and services are developed by experts and agreed upon through a consensus-based mechanism.

Widespread use of standards has many benefits.



Figure 8: Benefits of standards

#### 3.1.1. Standards Development

Standards are developed at National, European and International level through designated bodies. At international level, standards are developed by ISO (International Organization for Standardization) and IEC (International Electrotechnical Commission) and at European level, by CEN (European Committee for Standardization) and CENELEC (European Committee for Electrotechnical Standardization) and ETSI (European Telecommunications standards Institute), referred to collectively as the European Standardisation Organisations (ESOs).



Figure 9: National, European and International Standards bodies

NSAI is the national standards body for Ireland and is the Irish member body of CEN and CENELEC in Europe and ISO and IEC internationally. NSAI is also a member of ETSI. In order to monitor and input into the work of international standards bodies, NSAI establishes “national mirror committees” of national interested experts. These national committees correspond to committees at ISO, IEC, CEN and CENELEC level. They

<sup>35</sup> ISO website, *ISO standards are internationally agreed by experts.* [ISO - Standards](#)

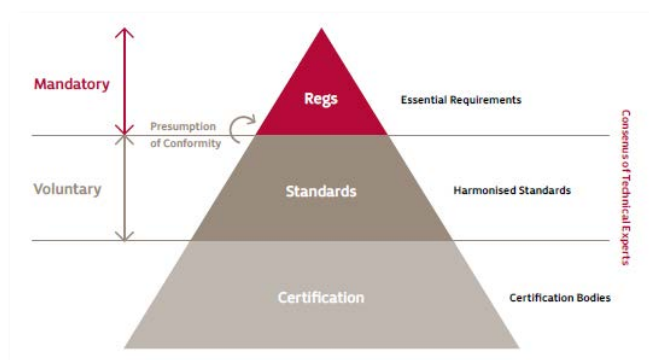
<sup>36</sup> Dublin City University Library website, Standards Home. [Home - Standards - LibGuides at Dublin City University](#)

keep track of, and participate in, international standardisation work and vote to record Irish positions on work items. NSAI facilitates Irish based experts and stakeholders to participate in standardisation at all levels. Currently NSAI has experts engaged in standardisation work at European and International level as contributing experts or as members of Irish delegations. In addition, NSAI supports Irish experts in taking leadership roles as chairs of international committees, convenors of working groups and as project leaders of international standards development work.

### 3.1.2. European Standards including Harmonised European Standards

At European level, standards play an important role in supporting organisations and businesses to comply with European legal requirements, across many sectors, including ICT products and services.

European harmonised standards are important instruments to facilitate the smooth implementation of European policies and legislation. For Europe, it is important that there are coordinated and consistent standards, developed through the consensus of all interested parties and adopted across the Union. The ESOs play a crucial role in supporting the harmonisation of Europe's internal market. Through their work, the ESOs ensure that one European standard is adopted identically in 34 countries, and work to promote European engagement in international standards development.



Harmonised European Standards, in particular, are European Standards that have been developed by the ESOs in accordance with a formalised process at the request of the European Commission. Manufacturers, other economic operators, or conformity assessment bodies can use harmonised standards to demonstrate that products, services, or processes comply with relevant essential requirements (presumption of conformity) laid down in European legislation<sup>37</sup> while also providing a basis for certification schemes.

Figure 10: Link between Regulation, Standards and Certification

Importantly in the EU, the European Regulation on Standardisation (Regulation 1025/2012)<sup>38</sup> enshrines the contribution of societal stakeholders and small and medium sized enterprises in the development of European standards.

### 3.1.3. Convergence between European and international Standards

A high level of convergence between the European and international standards is enabled by ongoing cooperation between CEN and ISO, and between CENELEC and IEC. Wherever possible, priority is given to international standardisation in order to realise the benefits of international standards in international trade and market harmonisation. As a result of agreements that exist between ISO and CEN<sup>39</sup>, and IEC and CENELEC<sup>40</sup> respectively, certain standards developed at international level may be adopted as European standards by CEN and CENELEC.

## 3.2. Standards in Artificial Intelligence

Standards have a vital role to play in the ICT sector generally and regarding AI in particular. ICT standards are essential in achieving interoperability of new technologies and can bring significant benefits to both industry, consumers and society. The development of ICT standards is integral to AI technologies and systems, in that these standards address *inter alia* the capture, storage, retrieval, processing, display, representation, security, privacy and interchange of data and information<sup>41</sup>.

<sup>37</sup> European Commission website, DG Internal Market, Industry, Entrepreneurship & SMEs, *Harmonised Standards*. [Harmonised Standards \(europa.eu\)](https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32012R1025&from=EN)

<sup>38</sup> Regulation (EU) No. 1025/2012 on European Standardisation. <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32012R1025&from=EN>, at Art 5

<sup>39</sup> CEN-CENELEC website. *The Vienna Frankfurt Agreement*. [CEN and ISO Cooperation - CEN-CENELEC \(cencenelec.eu\)](https://www.cenelec.eu/en/standards-development/development-of-frankfurt-agreement-deliverables)

<sup>40</sup> CEN-CENELEC website. *Development of Frankfurt Agreement deliverables*. [Development of Frankfurt Agreement deliverables \(cenelec.eu\)](https://www.cenelec.eu/en/standards-development/development-of-frankfurt-agreement-deliverables)

<sup>41</sup> National Institute of Standards & Technology, USA (2019), *U.S. Leadership in AI: A Plan for Federal Engagement in Developing Technical Standards and Related Tools*. [U.S. LEADERSHIP IN AI: A Plan for Federal Engagement in Developing Technical Standards and Related Tools \(nist.gov\)](https://www.nist.gov/leadership-in-ai)

As AI is one of the most transformational and pervasive technologies in the last few decades besides the introduction of computers themselves, Standards in AI have an important role to play in facilitating widespread acceptance and adoption of AI as a trustworthy, ethical and safe technology. AI Standards also enable the adoption of AI, in addressing questions regarding safety, fairness, reliability, accountability and transparency. AI standards support the practical and meaningful impact of the ethical principles and guidelines necessary for widespread AI adoption.

### 3.2.1. International AI Standards Development

In an increasingly globalised world, international AI standards are particularly essential in promoting a common global vision of trustworthy AI systems and building public trust in AI technologies. In light of the significant interest and activity in the field of AI in recent years, the importance of a coherent set of international AI standards has come to the fore. In response to this need at an international level, ISO and IEC established a joint standardisation committee on AI, namely ISO/IEC JTC 1/SC 42 (Subcommittee 42), which is active in the field of AI and big data. Its working groups are preparing standards on various aspects of AI, as illustrated in Figure 11. Table 1 in Annex B provides a current list of the JTC1/SC42 standards in development and the status of SC42's work programme on AI standardisation is available [here](#).

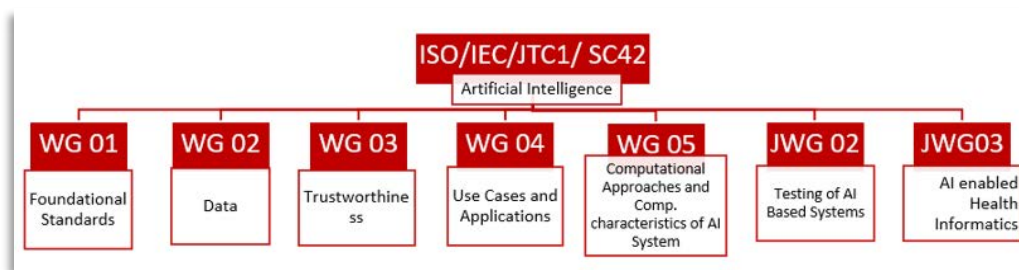


Figure 11: ISO/IEC/JTC1/SC42 Working Groups on AI Standardisation

Furthermore, the Institute of Electrical & Electronics Engineers (IEEE) is also significantly active in the area of artificial intelligence, particularly autonomous and intelligent systems. The IEEE has been developing its 7000 Series which are concerned with ethical considerations in a broad range of issues regarding autonomous and intelligent systems, including: transparency; privacy; algorithmic bias; categories of personal data; creating machine-readable privacy terms for all individuals; and considering the ethical implications of emulated empathy in AI systems. Along with an Ethically Aligned Design (EAD) and these standards projects, IEEE has created other resources related to AI including: EAD for Business: A Call to Action for Businesses Using AI; IEEE Trusted Data and Artificial Intelligence Systems (AIS) Playbook for Financial Services Addressing Ethical Dilemmas in AI: Listening to Engineers; and certification CertifiAIED<sup>42</sup>.

### 3.2.2. European AI Standards Development

With regard to standards in AI, European standards play a crucial role in supporting an effective AI regulatory framework system. In this regard, the ESOs maintain a close and well-established dialogue with the European Commission on strategic issues connected with AI standardisation<sup>43</sup>.

In December 2018, a CEN-CENELEC Focus Group on AI was established. The Focus Group included over 80 experts representing companies, consumers, researchers, trade unions, conformity assessment bodies, Member State governments and other societal stakeholders. The Focus Group had been tasked by CEN and CENELEC with identifying specific European requirements for AI and developing a European Road Map for Artificial Intelligence standardisation<sup>44</sup>.

In September 2020, the Focus Group published its Road Map, which established an overall framework and vision for European AI standardisation aimed at mitigating risks for European citizens and supporting the European AI industry.

<sup>42</sup> European Commission (2023), *Rolling Plan for ICT Standardisation 2023*. [Rolling Plan 2023 | Joinup \(europa.eu\)](#)

<sup>43</sup> European Commission (2023), *Rolling Plan for ICT Standardisation 2023*. [Rolling Plan 2023 | Joinup \(europa.eu\)](#)

<sup>44</sup> European Commission (2023), *Rolling Plan for ICT Standardisation 2023*. [Rolling Plan 2023 | Joinup \(europa.eu\)](#)

In June 2021, arising from the work of the Focus Group on AI, CEN-CENELEC created a Joint Technical Committee, namely CEN-CENELEC JTC 21. This Technical Committee is tasked with long-term planning of European standardisation in support of European regulation in the area of AI, and producing standardisation deliverables to address European market and societal needs and to underpin EU legislation, policies, principles and values<sup>45</sup>. The working groups and ad-hoc groups preparing standards on various aspects of AI are as illustrated in Figure 12.

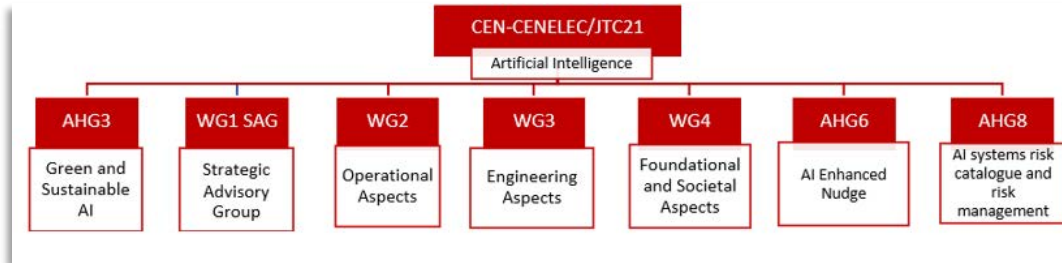


Figure 12: CEN-CENELEC/JTC21 Working Groups on AI Standardisation

ETSI, the European Telecommunications Standards Institute, is also very active in the area of AI and AI standardisation. ETSI has a number of technical committees and industry specification groups (ISGs) focused on human factors, experiential networked intelligence (ENI) and on securing AI. The ETSI ISG on Securing Artificial Intelligence (ISG SAI) focuses on using AI to enhance security, mitigating against attacks that leverage AI, and securing AI itself from attack. The ETSI ISG on Context Information Management (CIM) has published specifications for a data interchange format and a flexible information model. This work is applicable to the exchange of data/metadata with (or about) AI solutions, including signing of information to guarantee the origins of data and storage of historical results of AI solutions for later (human) oversight and governance, in the context of the EU AI Act<sup>46</sup>.

### 3.2.3. NSAI National AI Mirror Committee

At national level, NSAI has a committee dedicated to AI, namely NSAI Technical Committee 2 (ICT), Subcommittee 18 on Artificial Intelligence (NSAI/TC2/SC18). This Committee is comprised of Irish experts with a wide array of AI expertise. It acts as a mirror committee to ISO/IEC JTC 1/SC 42 and CEN/CENELEC JTC 21 on AI and through this Committee, Ireland actively contributes to the development of international AI Standards. Several members of this Committee play leadership roles in EU and international standards development as chairs of committees, convenors of working groups and as project leaders. In addition, committee members contribute as experts and members of Irish delegations.

<sup>45</sup> European Commission (2023), *Rolling Plan for ICT Standardisation 2023*. [Rolling Plan 2023 | Joinup \(europa.eu\)](#)

<sup>46</sup> European Commission (2023), *Rolling Plan for ICT Standardisation 2023*. [Rolling Plan 2023 | Joinup \(europa.eu\)](#)

## 4. Chapter 4: AI Standards & Assurance Roadmap

*“Let machines have all the Artificial Intelligence, as long as they are managed with human(e) wisdom”<sup>47</sup>*

### 4.1. AI Standards and Assurance Roadmap

The AI Standards & Assurance Roadmap actions in this Report are firmly situated within EU and international developments.

#### 4.1.1. AI Standards & AI Assurance Systems supporting the EU AI Regulatory Framework

The EU AI Act Proposal is a ‘New Legislative Framework-type’ legislation and consequently, harmonised European standards developed under the auspices of the Act are a key tool in: supporting the demonstration of compliance with the legislation; providing detailed technical specifications through which economic operators can achieve compliance with the relevant legal requirements; and contributing to the specific objective of ensuring that AI systems are safe and trustworthy<sup>48</sup>.

Similarly, the EU AI Act sets the context for, and future of, Ireland’s AI assurance regulatory model. AI Assurance processes are central to building confidence and trust in AI systems. They are a toolbox of measures to evaluate, demonstrate and monitor regulatory compliance in line with best practice and consensus-based standards, and to communicate reliable evidence to assure the public about the trustworthiness of AI systems. AI assurance processes also support responsible innovation by organisations and enable industry to have confidence in investing and developing new products and services. The EU AI Act provides for a robust AI assurance system which will require organisations developing and deploying AI to demonstrate compliance through the work of notified bodies and other conformity assessment bodies.

#### 4.1.2. AI Standards Roadmap Actions

With regard to an AI Standards Roadmap for Ireland, this section outlines the importance for Ireland of aligning its AI standardisation activities with European and international standardisation, and in particular, the development of harmonised European Standards.

As the EU AI Act, when adopted, will provide the grounding upon which all future AI activities and initiatives across the EU and Ireland will be based, it is critical to Ireland’s future in AI that European and international standardisation activities are at the core of Ireland’s AI Standards Roadmap. Consequently, Irish standardisation efforts are directed towards maximising Ireland’s contribution and influence on European and international Standardisation activities.

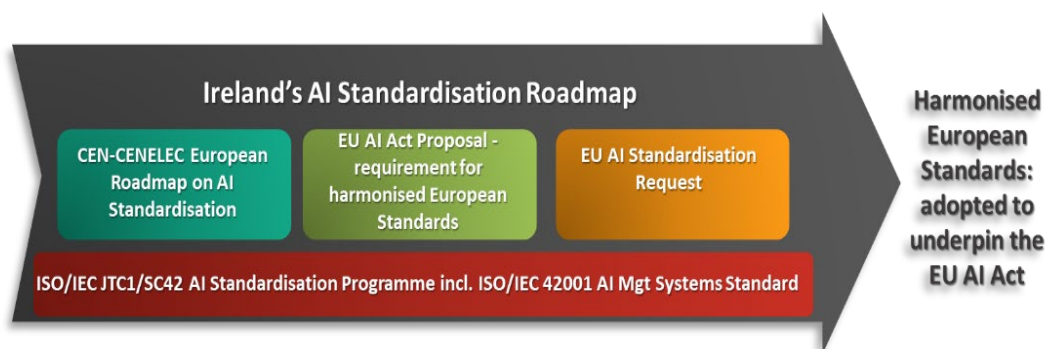


Figure 13: Overview of Ireland’s AI Standardisation Roadmap

Central to the Standards actions in this Roadmap is the need for Ireland to—

- continue to enhance its active role at the international standardisation fora of ISO/IEC and CEN/CENELEC,
- continue to increase the diversity of Irish AI standardisation participants to enhance inclusivity,
- increase awareness about Standards and provide guidance on their use and conformity assessment, and
- support the overall successful implementation of the EU AI Act by Irish businesses and industry.

<sup>47</sup> Aditya Mohan

<sup>48</sup> European Commission (2023), *Rolling Plan for ICT Standardisation 2023*. [Rolling Plan 2023 | Joinup \(europa.eu\)](https://european-council.europa.eu/media/en/press-communications/inline-photos/attachment-data/file/11442)



#### 4.1.2.1. European Roadmap on AI Standardisation & establishment of CEN-CENELEC JTC21 on AI

As outlined above, the CEN-CENELEC Focus Group on AI published its European Roadmap for AI standardisation in September 2020 setting out the overall framework and vision for European AI standardisation<sup>49</sup>. This was followed by CEN-CENELEC establishment of a Joint Technical Committee on AI, (CEN-CENELEC JTC 21) with the purpose of undertaking long-term planning and delivering European AI standardisation deliverables in support of the European AI regulatory framework<sup>50</sup>.

#### 4.1.2.2. EU AI Act Proposal, harmonised European Standards and the EU AI Standardisation Request

The EU AI Act enshrines the role of harmonised standards for high-risk AI systems, conveying a presumption of conformity with the Act's essential requirements where such systems are in conformity with the harmonised standards.

In an effort to expedite the development of harmonised European Standards in AI and ensure that those standards are available to users in a timely fashion, in May 2022, the European Commission issued a draft Standardisation Request to the ESOs<sup>51</sup>, requesting that they prepare new European standards or European standardisation deliverables in support of safe and trustworthy artificial intelligence systems.

In light of the strategic importance of these standards, standardisation work is ongoing to deliver on this Request, in cooperation with ISO/IEC and other standardisation organisations<sup>52,53</sup>. In undertaking this work the ESOs are required to facilitate effective participation of relevant stakeholders, including EU small and medium-sized enterprises and societal stakeholders<sup>54</sup>. In May 2023, the final AI Standardisation Request was adopted<sup>55</sup> (see Annex C).

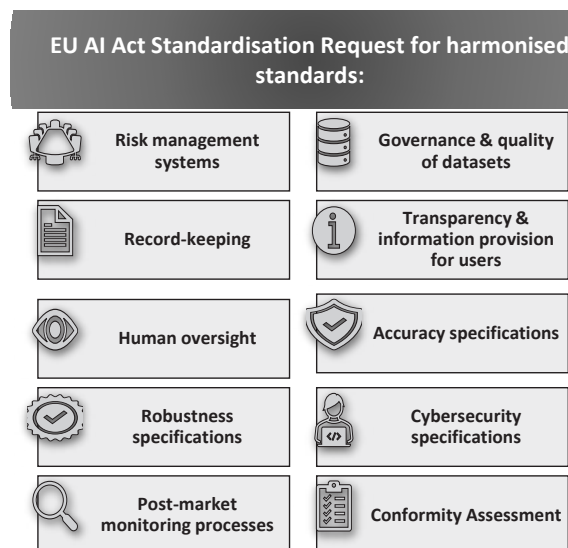


Figure 14: EU AI Act Standardisation Request for harmonised standards

Many necessary AI standards are at an advanced stage of development at both EU and international level. A complete list of Standards published and in development by CEN-CENELEC/JTC21 is set out in Annex B Table 2 below. These are highly aligned with the AI Standards requirements set out in Ireland's National AI Strategy<sup>56</sup>.

#### 4.1.2.3. ISO/IEC JTC 1/SC42 AI Management System Standard

In the field of AI standardisation, as in ICT standardisation in general, CEN and CENELEC work to ensure coherence between European and international standardisation activities. Consequently, JTC21 is tasked with supporting the work of ISO/IEC JTC1/SC42 and adopting relevant international standards which cohere with European objectives<sup>57</sup>. Consequently, the work of ISO/IEC JTC 1/SC 42 is being leveraged to address the Standardisation Request from the European Commission in the context of the draft EU AI Act.

<sup>49</sup> CEN-CENELEC Focus Group Report (2020), Road Map on Artificial Intelligence (AI). [CEN-CLC\\_FGR\\_RoadMapAI.pdf \(standict.eu\)](#)

<sup>50</sup> European Commission (2023), *Rolling Plan for ICT Standardisation 2023*. [Rolling Plan 2023 | Joinup \(europa.eu\)](#)

<sup>51</sup> European Commission website (2022), Draft Standardisation request to the European Standardisation Organisations in support of safe and trustworthy Artificial Intelligence. [Draft standardisation request to the European Standardisation Organisations in support of safe and trustworthy artificial intelligence, Dec 2022 DocsRoom - European Commission \(europa.eu\)](#)

<sup>52</sup> European Commission (2023), *Rolling Plan for ICT Standardisation 2023*. [Rolling Plan 2023 | Joinup \(europa.eu\)](#)

<sup>53</sup> European Commission website (2022), Draft Standardisation request to the European Standardisation Organisations in support of safe and trustworthy Artificial Intelligence. [Draft standardisation request to the European Standardisation Organisations in support of safe and trustworthy artificial intelligence, Dec 2022 DocsRoom - European Commission \(europa.eu\)](#)

<sup>54</sup> *Regulation (EU) No. 1025/2012 on European Standardisation*. <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32012R1025&from=EN>, Art 5

<sup>55</sup> European Commission Implementing Decision of 22 May 2023 on a standardisation request to the European Committee for Standardisation and the European Committee for Electrotechnical Standardisation in support of Union policy on artificial intelligence (C(2023)3215 – Standardisation Request M/593) [eNorm Platform \(europa.eu\)](#)

<sup>56</sup> 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 \(enterprise.gov.ie\)](#) at p27

<sup>57</sup> European Commission (2023), *Rolling Plan for ICT Standardisation 2023*. [Rolling Plan 2023 | Joinup \(europa.eu\)](#)

The highest priority area for AI standards at present are those required to support the AI assurance system provided for in the EU AI Act, namely AI management system and risk management standards. These will establish harmonised standards against which European conformity assessment can be carried out. Development of such an AI Management System Standard ([ISO/IEC FDIS 42001](#)) is currently at a very advanced stage by ISO/IEC JTC 1/SC 42.

This management system standard will specify requirements and provide guidance in relation to establishing, implementing, maintaining and continually improving AI management systems within organisations. The standard is focused on the responsible development and use of AI and is intended to support organisations in terms of compliance with regulatory requirements and meeting obligations to, and expectations of, AI users. It is intended that this standard will provide the basis for conformity assessment procedures.

#### 4.1.2.4. Ireland’s role in European and international standardisation in AI

Ireland has a unique position in hosting many of the world’s largest ICT and internet companies working with AI. This presents both an opportunity and a responsibility to lead the way in developing standards for responsible AI. Ireland is at the forefront of international AI standardisation activities, helping to both anticipate and shape the future trajectory and governance of global standards in AI technologies.

NSAI is playing a leading role in the development of International and European AI Standards. At ISO/IEC JTC1/SC42, Ireland holds the Convenorship and Secretariat of Working Group 3 on AI Trustworthiness and makes valuable contributions to several other working groups. Furthermore, an NSAI National Mirror Committee member is Project Editor of [ISO/IEC 42001](#).

Within CEN-CENELEC Ireland is an active participant in the work of JTC21, with experts participating on committees to develop European standards including those required by the EU AI Standardisation Request. NSAI continues to work to intensify Ireland’s influence and impact on international and European standardisation efforts, as well as to explore possible new areas of standardisation for the future development of AI.

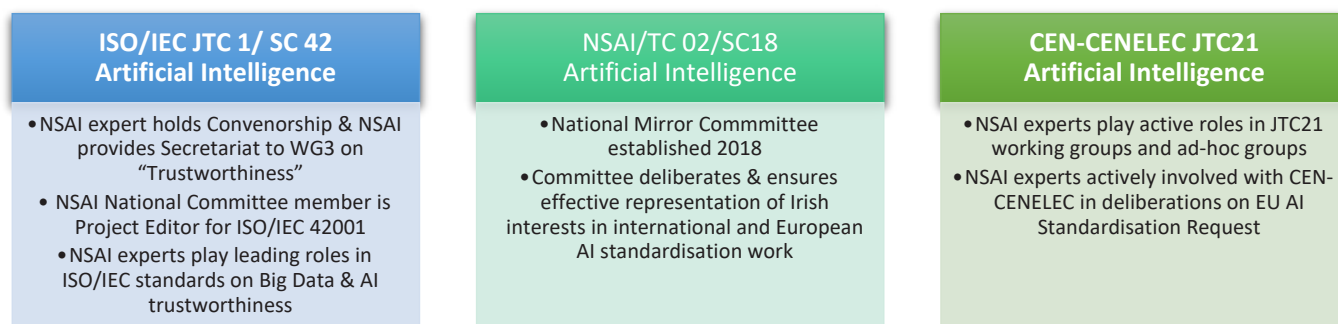


Figure 15: NSAI’s engagement at all three levels of standards development: national, EU and international

#### 4.1.3. AI Assurance Roadmap Actions

An effective AI assurance system is central to the EU AI Act implementation, as it will strengthen and sustain public and industry trust in AI technologies. The AI Assurance Actions in this Roadmap recognise the importance of Ireland building up an effective AI assurance ecosystem.

##### 4.1.3.1. EU AI Act & AI Assurance Processes

As outlined in Chapter 2, the EU AI Act sets out a risk-based approach to regulating AI systems with different types of obligations for different types of AI systems. The classification of an AI system as high-risk is based on the intended purpose of the AI system, with different assurance and conformity assessment requirements applicable depending on the AI system’s risk classification as per Figure 17.

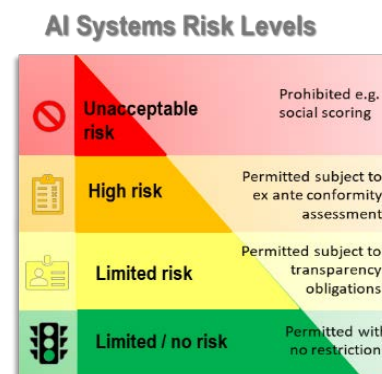


Figure 16: EU AI Act AI Systems’ risk level categories

The AI Assurance framework envisaged by the EU AI Act for high-risk AI systems is outlined in Figure 18:

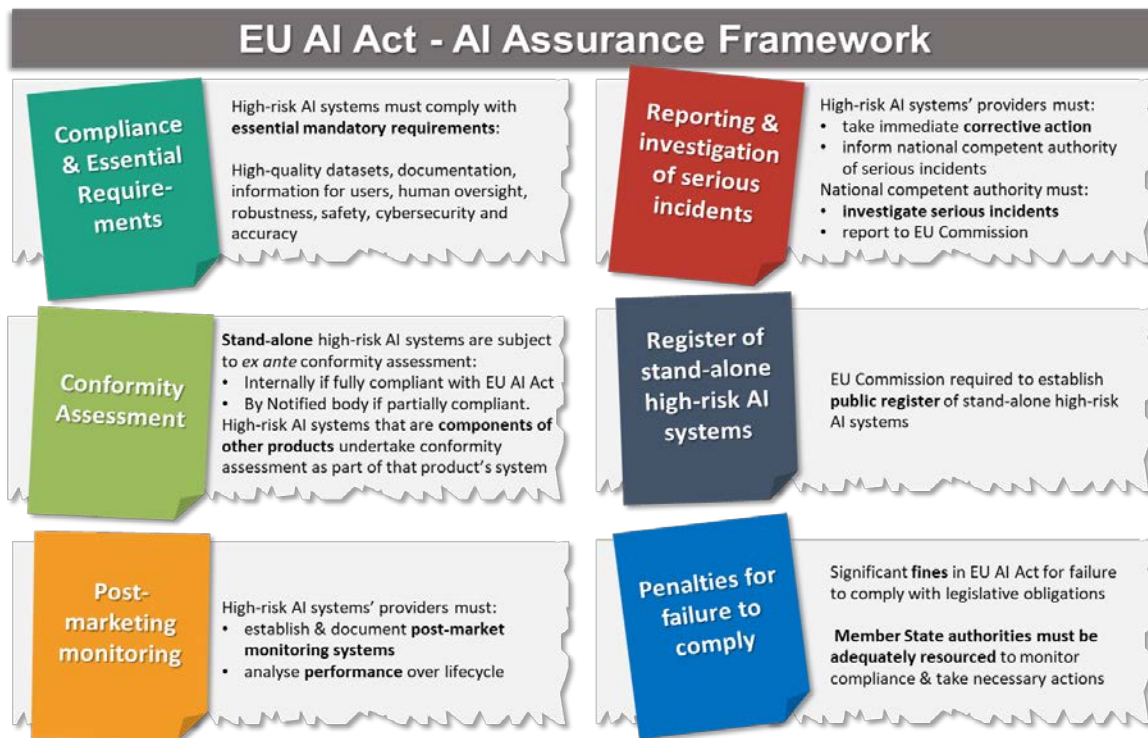


Figure 17: EU AI Act - AI Assurance Framework overview

The AI assurance actions in this Roadmap seek to ensure that Ireland will be ready in good time to implement the EU AI Act. This will provide certainty for Irish industry, civil society and other stakeholders. Having a robust AI assurance framework will necessitate key actions including:

- early designation of national regulatory bodies that will take on AI assurance roles;
- timely processes and guidance for industry in relation to how the AI regulatory system and conformity assessment will be implemented;
- developing a national AI assurance ecosystem to enhance Ireland's international reputation;
- where high-risk AI systems are components of other products in particular, it will be important that relevant national competent authorities, market surveillance authorities and notified bodies for these other relevant sectoral products work together to ensure that conformity assessment for AI systems as components are incorporated into their procedures.

NSAI has an established role as a notified body under EU medical devices, legal metrology and construction legislation and has vast experience in the provision of certification services. Consequently, conformity assessment of high-risk AI systems aligns well with NSAI's existing functions. Additionally, the NSAI as a notified body for medical devices will already be required to carry out conformity assessments where AI systems are components of medical devices. On that basis, NSAI is commencing preparations for seeking designation as an AI notified body and to rollout of certification schemes to support Irish businesses in navigating the AI regulatory landscape. The NSAI will also create awareness regarding AI standards and certification to support Irish businesses and AI systems providers and users.

## 4.2. AI Standards and Assurance Roadmap Actions

AI Standards & Assurance Roadmap Actions						
#	Category	Action	Performance Indicator	National AI Strategy	Lead	Timeline
1	Standards	<p>In line with the forthcoming EU AI Act, a range of AI standards are at an advanced stage of development at international and EU level. These standards will advance technical harmonisation and provide greater clarity to AI systems' developers, providers and users regarding key technical requirements under the EU AI Act.</p> <ul style="list-style-type: none"> <li>➤ NSAI will develop a <b>guidance document to map international and EU AI Standards to various aspects of EU AI Act</b>, emphasising the use of standards to demonstrate trustworthiness, reduce and mitigate harm, and minimise risk.</li> </ul>	Publication of a guidance mapping EU and international standards to EU AI Act for industry use which would help entities work towards compliance.	Strand 2	NSAI	<p>Ongoing</p> <p>Early 2024 (dependent on finalisation of key harmonised standards at EU level)</p>
2	Standards & Assurance	<p>The AI regulatory and standards landscape is currently undergoing immense change with the forthcoming introduction of the EU AI Act and significant standardisation at EU and international level.</p> <ul style="list-style-type: none"> <li>➤ In order to assist Irish AI systems providers, businesses and AI systems' users, the NSAI will– <ul style="list-style-type: none"> <li>• working closely with CEN/CENELEC under the auspices of the new EU High Level Forum<sup>58</sup>, to develop and roll out an <b>awareness campaign</b> focussed on <b>building and enhancing awareness regarding the requirements of AI standards, conformity assessment &amp; certification schemes</b>, and</li> <li>• continue to expand a catalogue of use cases demonstrating the benefits of Standards in AI adoption.</li> </ul> </li> </ul>	<p>Volume of AI standards sales in Ireland.</p> <p>Publication of a catalogue of use cases demonstrating value of AI standards and AI systems adoption.</p> <p>Measure of awareness / impact of certifications: No. of high-risk AI systems which have undergone conformity assessment by Irish Notified Body as % of total European Commission register.</p>	Strand 2 Strand 3 Strand 5 Strand 6	NSAI	Ongoing
3	Assurance	<p>In light of the imminent adoption of a new Artificial Intelligence Management System standard (ISO/IEC 42001), the forthcoming adoption of the EU AI Act, AI Liability Directive, and the publication of harmonised European Standards under the Act, a <b>national certification scheme</b> will be necessary to –</p> <ul style="list-style-type: none"> <li>• support AI systems' providers in demonstrating compliance with the EU AI Act,</li> <li>• provide assurance regarding the trustworthiness of AI systems, and the minimisation and mitigation of harm associated with AI.</li> </ul> <ul style="list-style-type: none"> <li>➤ NSAI is commencing preparations for– <ul style="list-style-type: none"> <li>• <b>seeking designation as an AI notified body</b> and</li> <li>• <b>the rollout of certification schemes</b> to support Irish businesses to navigate the AI regulatory landscape.</li> </ul> </li> </ul>	National conformity assessment / certification scheme in place.	Strand 2	NSAI	<p>Ongoing</p> <p>EU AI Act sets out an implementation period of 2 years from date of adoption of Act (projected 2025)</p> <p>For completion in advance of EU AI Act implementation date</p>
4	Assurance	<p>Irish businesses, AI systems providers and users will require guidance in navigating the conformity assessment and certification system that underpins the new EU AI Act regulatory framework.</p> <ul style="list-style-type: none"> <li>➤ NSAI will <b>develop guidance on certification</b> relevant to AI and processes in the EU AI Act.</li> </ul>	Publication of a guide for industry use on AI certification and measures to mitigate the adverse impact of AI.	Strand 2 Strand 3	NSAI	<p>Ongoing</p> <p>As above</p>
5	Standards	<p>In an increasingly globalised world, international standardisation in the area of AI is essential in enabling international trade, ensuring interoperability, and promoting trustworthy systems. At EU level, standards play a vital role in underpinning implementation of the future EU AI Act. NSAI is committed to advancing international AI standards development and maximising the influence of Irish stakeholders in those developments.</p>	Extent of engagement of Irish stakeholders and Irish AI community in EU and international AI standards development	Strand 2 Strand 3	NSAI	Ongoing

<sup>58</sup> The High-Level Forum on European Standardisation is part a new strategic forum established by the European Commission in 2023 as part of the EU Strategy on Standardisation. The purpose of the Forum is to identify standardisation priorities in support of EU policies and legislation, and discuss horizontal issues such as international leadership, education and skills and pre-normative challenges, in a multi-stakeholder setting. [High-Level Forum on European Standardisation \(europa.eu\)](https://european-council.europa.eu/media/en/press-communications/infographic/interim-report-high-level-forum-on-european-standardisation-2023)

## AI Standards & Assurance Roadmap Actions

Category	Action	Performance Indicator	National AI Strategy	Lead	Timeline
	<ul style="list-style-type: none"> <li>➤ NSAI will continually work to <b>maximise the participation and influence of the Irish AI expert community and stakeholders in international AI standards development</b>, and particularly in EU standardisation activities to support the implementation of the EU AI Act.</li> </ul>				
Standards	<p>To ensure that Irish interests and values (such as diversity, inclusion, fairness, trust etc) are taken into consideration in international AI standardisation, it is important that a <b>diverse range of Irish stakeholders</b> engage with Ireland's National AI Committee (NSAI TC02/SC18).</p> <ul style="list-style-type: none"> <li>➤ NSAI will continue to –               <ul style="list-style-type: none"> <li>• keep the Irish AI community, SMEs, and other stakeholders <b>informed about ongoing AI standardisation developments</b>,</li> <li>• build, promote and support a <b>diverse expert membership</b> of its National AI committee especially Irish SMEs, start-ups, ethical and legal experts and the public, in monitoring and inputting into the work of EU and international standardisation committees,</li> <li>• work with DETE, relevant State agencies, industry associations etc., to <b>identify and encourage participation by new Irish businesses, SMEs and stakeholders</b> that have an interest in AI standardisation.</li> </ul> </li> </ul>	Diverse and inclusive expert membership of NSAI National AI Committee	Strand 2 Strand 3	NSAI & DETE	Ongoing
Assurance	<p>The EU AI Act will require Member States to establish a robust regulatory infrastructure to implement assurance regarding AI systems. To ensure that Ireland is ready to effectively implement this regulatory framework, it will be important that the national body(ies) that will take on assurance roles are designated at an early opportunity.</p> <p>Furthermore, the EU AI Act envisages a different conformity assessment process where AI systems are components of consumer products governed by specified existing product safety legislation (e.g. medical devices, machinery, toys etc). In these circumstances, conformity assessment of the AI system, which is a component of the relevant product, will be conducted by the relevant sectoral notified body(ies) as part of existing sectoral safety legislation.</p> <ul style="list-style-type: none"> <li>➤ Ensuring that an effective national AI assurance apparatus is in place, in line with the EU AI Act will require–               <ul style="list-style-type: none"> <li>• <b>early designation of the relevant regulatory bodies at national level</b> as specified under the EU AI Act, to enable Irish regulatory bodies to prepare for the Act implementation, and conformity assessment bodies to obtain designation as an AI notified body at the earliest possible opportunity,</li> <li>• engagement with relevant national competent authorities, market surveillance authorities and notified bodies for other relevant sectoral products to ensure that conformity assessment for AI systems as components are incorporated into their procedures,</li> <li>• <b>clear processes and guidance regarding the implementation of the AI regulatory system</b>,</li> <li>• procedures for the designation of AI notified bodies and the requirements for conformity assessment processes and structures at a national level,</li> <li>• initiatives to build expertise in AI regulation, conformity assessment and standards development in order to enhance Ireland's international reputation in AI regulation and assurance.</li> </ul> </li> </ul>	Publication of national regulatory structures & processes for AI, including conformity assessment in Ireland	Strand 2 Strand 3 Strand 7	DETE,  AI national supervisory authority (when designated)  NSAI  Other relevant competent authorities, market surveillance authorities and notified bodies	Ongoing  EU AI Act sets out an implementation period of 2 years from date of adoption of Act (projected 2025)  For completion in advance of EU AI Act implementation date
Standards	In furthering the development of robust internationally accepted AI standards, it is vital that experts across Irish industry including	Number of SME, research, civil society and other	Strand 2 Strand 3	NSAI	Ongoing

## AI Standards & Assurance Roadmap Actions

#	Category	Action	Performance Indicator	National AI Strategy	Lead	Timeline
		<p>SMEs, researchers and society are <b>enabled and supported to actively participate in international AI standards development</b>.</p> <p>➤ NSAI will investigate with DETE and other organisations as appropriate, the <b>establishment of criteria-based funding mechanisms</b> (such as travel costs) to enable independent experts, experts from small organisations, civil society and researchers to travel to, and participate in, EU and international AI standards development.</p>	similar representatives representing Ireland at International ICT and AI Standards Development Working Groups		DETE	
9	Standards	<p>Standards development is recognised as a powerful tool to drive innovation, enable technological advancement, <b>bridge the innovation gap</b> between research and market, and increase market up-take of technological innovations.</p> <p>➤ To drive <b>stronger integration between AI standards development and Irish RDI activities</b>, NSAI will–</p> <ul style="list-style-type: none"> <li>• continue to create awareness amongst the RDI sector of the value of ICT and AI standards development,</li> <li>• work with SFI, RDI sector and other bodies to increase the proportion of research proposals that include standardisation activities as a component,</li> <li>• work with SFI and other relevant bodies to explore mechanisms to give increased priority to standardisation-related research.</li> </ul>	Research proposals which involve AI standards reported by value, and as a share of total research proposals.	Strand 2 Strand 5 Strand 6	NSAI  DETE	Ongoing
10	Standards & Assurance	In order to give guidance to AI systems' providers in correctly applying the EU AI Act regulatory framework, it will be important that the National Supervisory Authority for AI (when designated) develop a <b>risk assessment tool or framework</b> at national level to provide guidance for AI systems developers and providers in seeking to categorise AI systems as envisaged in the EU AI Act and related initiatives of the EU Commission.	Publication of a risk assessment tool / framework as guidance for Irish AI systems' providers to support implementation of the EU AI Act.	Strand 2 Strand 3	AI national supervisory authority (when designated)	For completion in advance of EU AI Act implementation date

## Annex A: Top Team on Standards in AI Participants

### Top Team on Standards in AI: Participants

Name	Organisation	Name	Organisation
Alessandra Sala	Shutterstock	John McCarthy	ARUP
Allan Beechinor	Altada Technology Solutions	Laoibhse Teresa Ní Fhaolain	SFI Connect
Amelia Kelly	Soapbox Labs	Maria Murphy	Maynooth University
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## Annex B: AI Standards List

Table 1: ISO/IEC/JTC1/SC42 AI Standards in Development<sup>59</sup>

<b>TABLE 1: ISO/IEC/JTC1/SC42 AI Standards in Development</b>			
Reference	Project title	Developing committee	Current stage <sup>60</sup>
<a href="#">ISO/IEC CD 5339</a>	Information Technology — Artificial Intelligence — Guidelines for AI applications	ISO/IEC JTC 1/SC 42/WG 4	40.60
<a href="#">ISO/IEC 25059:2023</a>	Software engineering — Systems and software Quality Requirements and Evaluation (SQuaRE) — Quality model for AI systems	ISO/IEC JTC 1/SC 42/WG 3	60.60
<a href="#">ISO/IEC DTS 25058</a>	Software and systems engineering — Systems and software Quality Requirements and Evaluation (SQuaRE) — Guidance for quality evaluation of AI systems	ISO/IEC JTC 1/SC 42/WG 3	50.00
<a href="#">ISO/IEC CD TR 24030</a>	Information technology — Artificial intelligence (AI) — Use cases	ISO/IEC JTC 1/SC 42/WG 4	30.60
<a href="#">ISO/IEC DIS 24029-2</a>	Artificial intelligence (AI) — Assessment of the robustness of neural networks — Part 2: Methodology for the use of formal methods	ISO/IEC JTC 1/SC 42/WG 3	60.00
<a href="#">ISO/IEC DIS 5259-1</a>	Artificial intelligence — Data quality for analytics and machine learning (ML) — Part 1: Overview, terminology, and examples	ISO/IEC JTC 1/SC 42/WG 2	40.20
<a href="#">ISO/IEC DIS 5259-3</a>	Artificial intelligence — Data quality for analytics and machine learning (ML) — Part 3: Data quality management requirements and guidelines	ISO/IEC JTC 1/SC 42/WG 2	40.20
<a href="#">ISO/IEC DIS 5259-4</a>	Artificial intelligence — Data quality for analytics and machine learning (ML) — Part 4: Data quality process framework	ISO/IEC JTC 1/SC 42/WG 2	40.20
<a href="#">ISO/IEC CD TR 17903</a>	Information technology — Artificial intelligence — Overview of machine learning computing devices	ISO/IEC JTC 1/SC 42/WG 5	30.20
<a href="#">ISO/IEC AWI 12792</a>	Information technology — Artificial intelligence — Transparency taxonomy of AI systems	ISO/IEC JTC 1/SC 42/WG 3	20.00
<a href="#">ISO/IEC CD TS 12791</a>	Information technology — Artificial intelligence — Treatment of unwanted bias in classification and regression machine learning tasks	ISO/IEC JTC 1/SC 42/WG 3	30.60
<a href="#">ISO/IEC CD TS 8200</a>	Information technology — Artificial intelligence — Controllability of automated artificial intelligence systems	ISO/IEC JTC 1/SC 42/WG 3	30.20
<a href="#">ISO/IEC 8183</a>	Information technology — Artificial intelligence — Data life cycle framework	ISO/IEC JTC 1/SC 42/WG 2	60.00
<a href="#">ISO/IEC CD TS 6254</a>	Information technology — Artificial intelligence — Objectives and approaches for explainability of ML models and AI systems	ISO/IEC JTC 1/SC 42/WG 3	30.20
<a href="#">ISO/IEC DIS 5259-2</a>	Artificial intelligence — Data quality for analytics and machine learning (ML) — Part 2: Data quality measures	ISO/IEC JTC 1/SC 42/WG 2	40.00
<a href="#">ISO/IEC CD 5259-5</a>	Artificial intelligence — Data quality for analytics and machine learning (ML) — Part 5: Data quality governance	ISO/IEC JTC 1/SC 42/WG 2	30.60
<a href="#">ISO/IEC CD 42006</a>	Information technology — Artificial intelligence — Requirements for bodies providing audit and certification of artificial intelligence management systems	ISO/IEC JTC 1/SC 42	30.99
<a href="#">ISO/IEC CD 42005</a>	Information technology — Artificial intelligence — AI system impact assessment	ISO/IEC JTC 1/SC 42/WG 1	30.20
<a href="#">ISO/IEC FDIS 42001</a>	Information technology — Artificial intelligence — Management system	ISO/IEC JTC 1/SC 42/WG 1	50.00
<a href="#">ISO/IEC 38507:2022</a>	Information technology — Governance of IT — Governance implications of the use of artificial intelligence by organizations	ISO/IEC JTC 1/SC 42	60.60
<a href="#">ISO/IEC AWI TS 29119-11</a>	Software and systems engineering — Software testing — Part 11: Testing of AI systems	ISO/IEC JTC 1/SC 42/JWG 2	20.00
<a href="#">ISO/IEC 24668:2022</a>	Information technology — Artificial intelligence — Process management framework for big data analytics	ISO/IEC JTC 1/SC 42/WG 2	60.60
<a href="#">ISO/IEC TR 24372:2021</a>	Information technology — Artificial intelligence (AI) — Overview of computational approaches for AI systems	ISO/IEC JTC 1/SC 42/WG 5	60.60
<a href="#">ISO/IEC TR 24368:2022</a>	Information technology — Artificial intelligence — Overview of ethical and societal concerns	ISO/IEC JTC 1/SC 42/WG 3	60.60
<a href="#">ISO/IEC TR 24030:2021</a>	Information technology — Artificial intelligence (AI) — Use cases	ISO/IEC JTC 1/SC 42/WG 4	90.92
<a href="#">ISO/IEC TR 24029-1:2021</a>	Artificial Intelligence (AI) — Assessment of the robustness of neural networks — Part 1: Overview	ISO/IEC JTC 1/SC 42/WG 3	60.60
<a href="#">S.R. ISO/IEC TR 24028:2020</a>	Information technology — Artificial intelligence — Overview of trustworthiness in artificial intelligence	ISO/IEC JTC 1/SC 42/WG 3	60.60
<a href="#">ISO/IEC TR 24027:2021</a>	Information technology — Artificial intelligence (AI) — Bias in AI systems and AI aided decision making	ISO/IEC JTC 1/SC 42/WG 3	60.60
<a href="#">ISO/IEC 23894:2023</a>	Information technology — Artificial intelligence — Guidance on risk management	ISO/IEC JTC 1/SC 42/WG 3	60.00
<a href="#">ISO/IEC 23053:2022</a>	Framework for Artificial Intelligence (AI) Systems Using Machine Learning (ML)	ISO/IEC JTC 1/SC 42/WG 1	60.60

<sup>59</sup> Correct as at mid-July 2023. To purchase any of these standards: [NSAI Standards Store](#). For up-to-date list see: [ISO - ISO/IEC JTC 1/SC 42 - Artificial intelligence](#)

<sup>60</sup> See Figure 18 below for an explanation of the Current Stage Codes



**TABLE 1:  
ISO/IEC/JTC1/SC42 AI Standards in Development**

Reference	Project title	Developing committee	Current stage <sup>60</sup>
<a href="#">ISO/IEC 22989:2022</a>	Information technology — Artificial intelligence — Artificial intelligence concepts and terminology	ISO/IEC JTC 1/SC 42/WG 1	60.60
<a href="#">S.R. ISO/IEC TR 20547-1:2020</a>	Information technology — Big data reference architecture — Part 1: Framework and application process	ISO/IEC JTC 1/SC 42/WG 2	60.60
<a href="#">S.R. ISO/IEC TR 20547-2:2018</a>	Information technology — Big data reference architecture — Part 2: Use cases and derived requirements	ISO/IEC JTC 1/SC 42	60.60
<a href="#">I.S. ISO/IEC 20547-3:2020</a>	Information technology — Big data reference architecture — Part 3: Reference architecture	ISO/IEC JTC 1/SC 42/WG 2	60.60
<a href="#">S.R. ISO/IEC TR 20547-5:2018</a>	Information technology — Big data reference architecture — Part 5: Standards roadmap	ISO/IEC JTC 1/SC 42	60.60
<a href="#">I.S. ISO/IEC 20546:2019</a>	Information technology — Big data — Overview and vocabulary	ISO/IEC JTC 1/SC 42/WG 2	60.60
<a href="#">ISO/IEC AWI TR 20226</a>	Information technology — Artificial intelligence — Environmental sustainability aspects of AI systems	ISO/IEC JTC 1/SC 42/WG 4	20.00
<a href="#">ISO/IEC AWI TR 18988</a>	Artificial intelligence — Application of AI technologies in health informatics	ISO/IEC JTC 1/SC 42/JWG 3	20.00
<a href="#">ISO/IEC PWI 18966</a>	Artificial intelligence — Oversight of AI systems	ISO/IEC JTC 1/SC 42/WG 3	00.00
<a href="#">ISO/IEC PWI 17866</a>	Artificial intelligence — Best practice guidance for mitigating ethical and societal concerns	ISO/IEC JTC 1/SC 42/WG 3	00.00
<a href="#">ISO/IEC AWI TS 17847</a>	Information technology — Artificial intelligence — Verification and validation analysis of AI systems	ISO/IEC JTC 1/SC 42/JWG 2	20.00
<a href="#">ISO/IEC CD TR 5469</a>	Artificial intelligence — Functional safety and AI systems	ISO/IEC JTC 1/SC 42/WG 3	30.99
<a href="#">ISO/IEC DIS 5392</a>	Information technology — Artificial intelligence — Reference architecture of knowledge engineering	ISO/IEC JTC 1/SC 42/WG 5	40.60
<a href="#">ISO/IEC FDIS 5338</a>	Information technology — Artificial intelligence — AI system life cycle processes	ISO/IEC JTC 1/SC 42/WG 4	50.00
<a href="#">ISO/IEC TS 4213:2022</a>	Information technology — Artificial intelligence — Assessment of machine learning classification performance	ISO/IEC JTC 1/SC 42/WG 5	60.60
<a href="#">ISO/IEC AWI TR 21221</a>	Information technology – Artificial intelligence – Beneficial AI systems		20.00
<a href="#">ISO/IEC CD TR 5259-6</a>	Artificial intelligence — Data quality for analytics and machine learning (ML) — Part 6: Visualization framework for data quality		30.00
ISO/IEC PWI 42107	Information technology — Artificial intelligence — AI lightweight modeling		00.00
<a href="#">ISO/IEC AWI TR 42106</a>	Information technology — Artificial intelligence — Overview of differentiated benchmarking of AI system quality characteristics		20.00
ISO/IEC NP 42105	Information technology — Artificial intelligence — Guidance for human oversight of AI systems		10.20
<a href="#">ISO/IEC AWI TR 42103</a>	Information technology — Artificial intelligence — Overview of synthetic data in the context of AI systems		20.00
ISO/IEC NP 42102	Information technology — Artificial intelligence — Taxonomy of AI system methods and capabilities		10.20
ISO/IEC NP 24029-3	Artificial intelligence (AI) — Assessment of the robustness of neural networks — Part 3: Methodology for the use of statistical methods		10.20
ISO/IEC NP 23282	Artificial Intelligence — Evaluation methods for accurate natural language processing systems		10.20
ISO/IEC NP TS 22443	Information technology — Artificial intelligence — Guidance on addressing societal concerns and ethical considerations		10.20
ISO/IEC NP TS 22440	Artificial intelligence — Functional Safety and AI systems — Requirements		10.20

Table 2: CEN-CENELEC JTC21 AI Standards in Development<sup>61</sup>

TABLE 2: CEN-CENELEC JTC21 AI Standards in Development			
WI Number	Reference	Title	Standard Status
<a href="#">JT021001</a>	prCEN/CLC/TR 17894	Artificial Intelligence Conformity Assessment	Active
<a href="#">JT021002</a>	prCEN/CLC/TR XXXX	Artificial Intelligence - Overview of AI tasks and functionalities related to natural language processing	Active
JT021003	prEN XXX	AI-enhanced nudging	Not Published
<a href="#">I.S. EN ISO/IEC 22989:2023</a>	I.S. EN ISO/IEC 22989:2023	Information technology - Artificial intelligence - Artificial intelligence concepts and terminology (ISO/IEC 22989:2022)	Published
<a href="#">I.S. EN ISO/IEC 23054:2023</a>	I.S. EN ISO/IEC 23053:2023	Framework for Artificial Intelligence (AI) Systems Using Machine Learning (ML) (ISO/IEC 23053:2022)	Published
<a href="#">JT021006</a>	prEN XXXXX	AI-enhanced nudging	Proposed
<a href="#">JT021007</a>	prCEN/TR XXX	Data Governance and data quality for AI in the European context	Waiting
<a href="#">JT021008</a>	prEN XXX	Artificial Intelligence trustworthiness characterisation	Waiting
<a href="#">JT021009</a>	prCEN/TR XXX	AI Risks - Check List for AI Risks Management	Waiting
<a href="#">JT021010</a>	prCEN/TR XXX	Information Technology - Artificial Intelligence - Green and Sustainable AI	Proposed
<a href="#">JT021011</a>	prEN ISO/IEC 42001	Information technology - Artificial intelligence - Management system	Active
JT021012	prEN XXX	Accuracy of natural language processing systems	Not Published
<a href="#">JT021013</a>	prCEN ISO/IEC/TS 12791	Information technology - Artificial intelligence - Treatment of unwanted bias in classification and regression machine learning tasks	Active
<a href="#">JT021014</a>	prEN ISO/IEC 25059	Software engineering - Systems and software Quality Requirements and Evaluation (SQuaRE) - Quality model for AI systems	Preliminary
<a href="#">JT021015</a>	prEN ISO/IEC 24029-2	Artificial intelligence (AI) - Assessment of the robustness of neural networks - Part 2: Methodology for the use of formal methods	Preliminary
JT021016	prEN ISO/IEC 23894	Information technology - Artificial intelligence - Guidance on risk management	Not Published
JT021017	prCEN/CLC ISO/IEC/TR 24027	Information technology - Artificial intelligence (AI) - Bias in AI systems and AI aided decision making	Not Published
JT021018	prCEN/CLC ISO/IEC/TR 24029-1	Artificial Intelligence (AI) - Assessment of the robustness of neural networks - Part 1: Overview	Not Published
JT021019	prEN XXX	Competence Requirements for AI ethicists professionals	Not Published

Figure 18: International Harmonised Stage Codes

International harmonized stage codes							
STAGE	SUBSTAGE						
	00 Registration	20 Start of main action	60 Completion of main action	92 Repeat an earlier phase	93 Repeat current phase	98 Abandon	99 Proceed
00 Preliminary stage	00.00 Proposal for new project received	00.20 Proposal for new project under review	00.60 Close of review			00.98 Proposal for new project abandoned	00.99 Approval to ballot proposal for new project
10 Proposal stage	10.00 Proposal for new project registered	10.20 New project ballot initiated	10.60 Close of voting	10.92 Proposal returned to submitter for further definition		10.98 New project rejected	10.99 Approval to New project approved
20 Preparatory stage	20.00 New project registered in TC/SC work programme	20.20 Working draft (WD) study initiated	20.60 Close of comment period			20.98 Project deleted	20.99 WD approved for registration as CD
30 Committee stage	30.00 Committee draft (CD) registered	30.20 CD study initiated	30.60 Close of comment period	30.92 CD referred back to Working Group		30.98 Project deleted	30.99 CD approved for registration as DIS
40 Enquiry stage	40.00 DIS registered	40.20 DIS ballot initiated: 12 weeks	40.60 Close of voting	40.92 Full report circulated: DIS referred back to TC or SC	40.93 Full report circulated: decision for new DIS ballot	40.98 Project deleted	40.99 Full report circulated: DIS approved for registration as FDIS
50 Approval stage	50.00 Final text received or FDIS registered for formal approval	50.20 Proof sent to secretariat or FDIS ballot initiated: 8 weeks	50.60 Close of voting. Proof returned by secretariat	50.92 FDIS or proof referred back to TC or SC		50.98 Project deleted	50.99 FDIS or proof approved for publication
60 Publication stage	60.00 International Standard under publication		60.60 International Standard published				
90 Review stage		90.20 International Standard under periodical review	90.60 Close of review	90.92 International Standard to be revised	90.93 International Standard confirmed		90.99 Withdrawal of International Standard proposed by TC or SC
95 Withdrawal stage		95.20 Withdrawal ballot initiated	95.60 Close of voting	95.92 Decision not to withdraw International Standard			95.99 Withdrawal of International Standard

<sup>61</sup> Correct as at mid-July 2023. To purchase any of these standards: [NSAI Standards Store](#).

## Annex C: EU AI Standardisation Request

COMMISSION IMPLEMENTING DECISION  
on a standardisation request to the European Standardisation Organisations  
in support of safe and trustworthy artificial intelligence<sup>62</sup>

### Annex I

#### List of new European Standards and European standardisation deliverables to be drafted

Reference Information	
1.	European standard(s) and/or European standardisation deliverable(s) on risk management systems for AI systems
2.	European standard(s) and/or European standardisation deliverable(s) on governance and quality of datasets used to build AI systems
3.	European standard(s) and/or European standardisation deliverable(s) on record keeping through logging capabilities by AI systems
4.	European standard(s) and/or European standardisation deliverable(s) on transparency and information provisions for users of AI systems
5.	European standard(s) and/or European standardisation deliverable(s) on human oversight of AI systems
6.	European standard(s) and/or European standardisation deliverable(s) on accuracy specifications for AI systems
7.	European standard(s) and/or European standardisation deliverable(s) on robustness specifications for AI systems
8.	European standard(s) and/or European standardisation deliverable(s) on cybersecurity specifications for AI systems
9.	European standard(s) and/or European standardisation deliverable(s) on quality management systems for providers of AI systems, including post-market monitoring processes
10.	European standard(s) and/or European standardisation deliverable(s) on conformity assessment for AI systems

### Annex II

#### Requirements for the European standards and European standardisation deliverables referred to in Article 1

The detailed requirements for European standards and European standardisation deliverables set out in Annex I above can be accessed in the draft Standardisation Request [here](#).

<sup>62</sup> European Commission website (2022), Draft Standardisation request to the European Standardisation Organisations in support of safe and trustworthy Artificial Intelligence. [Draft standardisation request to the European Standardisation Organisations in support of safe and trustworthy artificial intelligence, Dec 2022 DocsRoom - European Commission \(europa.eu\)](#)

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# NSAI

The AI Standards & Assurance Roadmap was developed with thanks to the **Top Team on Standards in AI**, led by the National Standards Authority of Ireland

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