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AI Standardisation supporting regulatory needs

Workshop of ISO/IEC JTC 1 SC 42

25 May 2022



Standardising AI ?

5 Years ago...

People were wondering WHY you would standardise AI and WHAT you would possibly want to standardise

Standardising AI – Two Aspects: Compare to Machinery

Example of machinery:

You don't standardise how the machine works

But you standardise the input, the output and the external factors around the machine



Standardising AI – Two Aspects: Ethics

AI has brought the topic of ETHICS into standardisation.

How do Humans and AI systems work hand-in-hand
Which are ethical impacts of running and using AI systems
What needs to be addressed for ensuring “ethical AI”
Who takes decisions and holds responsibility



Transparency

Trustworthiness

Values

Risks

Governance

Processes

Accountability

Sovereignty

Criteria

Control

Data



Pioneers in AI Standardisation – IEEE and ISO/IEC JTC 1

THE IEEE GLOBAL INITIATIVE ON ETHICS OF AUTONOMOUS AND INTELLIGENT SYSTEMS

The IEEE Global Initiative's mission is, to ensure every stakeholder involved in the design and development of autonomous and intelligent systems is educated, trained, and empowered to prioritize ethical considerations so that these technologies are advanced for the benefit of humanity.

[<https://standards.ieee.org/industry-connections/ec/autonomous-systems/>]

ISO/IEC JTC 1 SC 42 ARTIFICIAL INTELLIGENCE

Serve as the focus and proponent for JTC 1's standardization program on Artificial Intelligence

Provide guidance to JTC 1, IEC, and ISO committees developing Artificial Intelligence applications

[<https://www.iso.org/committee/6794475.html>]

IBM Policy Lab: Precision Regulation for Artificial Intelligence

5 policy imperatives for companies, based on whether they are a provider or owner (or both) of an AI system

Designate a lead AI ethics official

Responsible for trustworthy AI

Accountable for internal guidance and compliance mechanisms

Oversee risk assessments and harm mitigation strategies

Different rules for different risks

Initial high-level assessment of the technology's potential for harm

In-depth and detailed assessment for higher-risk applications

Document assessment processes in detail to be auditable, and retain them for a minimum period of time

Don't hide your AI

Promote transparency is through disclosure

Make purpose of an AI system clear to consumers and businesses

Explain your AI

Maintain audit trails surrounding input and training data

Make available documentation informing about confidence measures, levels of procedural regularity, error analysis

Test your AI for bias.

Responsibility that AI systems are fair and secure

Take remedial actions as needed, both before sale or deployment and after an AI system is operationalised

See <https://www.ibm.com/blogs/policy/ai-precision-regulation/>

US Policy Initiatives Around AI

NATIONAL ARTIFICIAL INTELLIGENCE INITIATIVE ACT OF 2020 (DIVISION E, SEC. 5001)

AI IN GOVERNMENT ACT OF 2020 (DIVISION U, TITLE I)

EO 13859, MAINTAINING AMERICAN LEADERSHIP IN AI

EO 13960, PROMOTING USE OF TRUSTWORTHY AI IN FEDERAL GOVERNMENT

**OMB (EO Office of Management and Budget) GUIDANCE FOR THE REGULATION OF AI
NATIONAL ARTIFICIAL INTELLIGENCE INITIATIVE ACT OF 2020 (DIVISION E, SEC. 5001)**

- ensure continued U.S. leadership in AI R&D
- lead the world in the development and use of trustworthy AI systems in public and private sectors
- prepare the present and future US workforce for the integration of artificial intelligence systems across all sectors of the economy and society
- support opportunities for international cooperation with strategic allies on R&D, assessment, and resources for trustworthy AI systems

European Union High Level Expert Group on AI

Ethics Guidelines on Artificial Intelligence:

The Guidelines put forward a human-centric approach on AI and list 7 key requirements that AI systems should meet in order to be trustworthy.

Human agency and oversight
Technical robustness and safety
Privacy and Data governance
Transparency

Diversity, non-discrimination and fairness
Societal and environmental well-being
Accountability

[<https://ec.europa.eu/futurium/en/european-ai-alliance/ai-hleg-steering-group-european-ai-alliance.html>]

OECD.AI – Focus on AI with a Broad Scope

OECD AI Policy Observatory

We provide data and multi-disciplinary analysis on artificial intelligence. Our diverse global community of partners makes this platform a unique source of information and dialogue on AI.



Countries & tools

AI policies from over 60 countries and tools from business, technologists and others



OECD AI Principles

Priorities for trustworthy AI policies and practices



Policy areas

How AI affects everything from jobs to health and the environment



Trends & data

Developments in AI news, research, funding, jobs, skills, software and more

[\[https://oecd.ai/en/\]](https://oecd.ai/en/)

Good governance and ethical standards are of key interest for the provision and adoption of AI technologies.

Governments around the world look at promoting the uptake of AI technologies and ensuring leadership and societal benefits of AI via appropriate regulatory and policy measures.

Open and voluntary standardisation has come a good way in providing relevant standards for ensuring high-quality, trustworthy and ethical AI systems.

Open and voluntary standards play a key role for delivering “good AI”.

AI Regulation and Standardisation

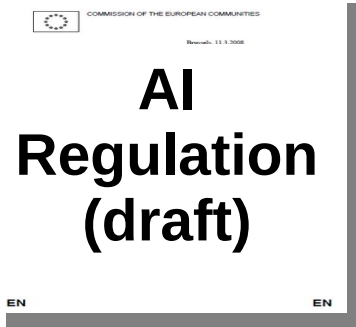
European Commission issued a proposal for an AI regulation

It includes a risk-based approach and is modelled according to the New Legislative Framework, i.e. with harmonised European Standards as a basis for demonstrating compliance.

EU New Legislative Framework (NLF)



New regulated areas: Artificial Intelligence



<https://ec.europa.eu/newsroom/dae/items/709090>

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POLICY AND LEGISLATION

Proposal for a Regulation laying down harmonised rules on artificial intelligence (Artificial Intelligence Act)

The Commission is proposing the first ever legal framework on AI, which addresses the risks of AI and positions Europe to play a leading role globally.

Article 40 – Harmonised standards

High-risk AI systems which are in conformity with harmonised standards or parts thereof the references of which have been published in the Official Journal of the European Union shall be presumed to be in conformity with the requirements set out in Chapter 2 of this Title, to the extent those standards cover those requirements.

A “Back Stop” in the Draft Regulation on AI

Article 41 – Common specifications

1. Where harmonised standards referred to in Article 40 do not exist or where the Commission considers that the relevant harmonised standards are insufficient or that there is a need to address specific safety or fundamental right concerns, the Commission may, by means of implementing acts, adopt common specifications in respect of the requirements set out in Chapter 2 of this Title. Those implementing acts shall be adopted in accordance with the examination procedure referred to in Article 74(2).

EU Draft Regulation on AI – Essential Requirements

Essential requirements as laid down in EU Draft Regulation, Chapter 2, Articles 9-15:

Risk management system

Data and data governance

Technical documentation

Record-keeping

Transparency and provision of information to users

Human oversight

Accuracy, robustness and cybersecurity

ISO/IEC JTC 1 SC 42 has work ongoing on all of these topics and issues

Objective must be to have international standards supporting regulatory and policy needs globally

Ideally international standards will be accepted as European standards

EU Rolling Plan for ICT Standardisation – Chapter on AI



Developed by the European Commission in collaboration with the EU Multi-Stakeholder Platform for ICT Standardisation, an expert advisory group of the European Commission

Covering 35+ policy areas and identifying standardisation needs for supporting policy objectives

Invitation to ICT standardisation community to get active on standardisation: “Actions” in part B of each chapter

Does not cover standards for EU regulation

PDF version: <https://ec.europa.eu/docsroom/documents/49834>

Web version: <https://joinup.ec.europa.eu/collection/rolling-plan-ict-standardisation/rolling-plan-2022>

Actions on AI in the EU Rolling Plan for ICT Standardisation (1/2)

Action 1 SDOs should establish coordinated linkages with, and adequately consider European requirements or expectations from initiatives, including policy initiatives, and organisations contributing to the discourse on AI standardisation. This in particular includes the contents of the EU proposal for an AI Regulation and of the standardisation request on AI issued by the European Commission in 2022 as well as the orientations set in the 2021 review of the Coordinated Plan

Action 2 SDOs should further increase their coordination efforts around AI standardisation both in Europe and internationally in order to avoid overlap or unnecessary duplication of efforts and aim to the highest quality to ensure a trustworthy and safe deployment of this technology.

Action 3 ESOs should coordinate with the Commission and appropriately direct their activities to ensure that the objectives set in the standardisation request on AI issued in 2022 are adequately and timely fulfilled

Action 4 Taking into account the cross-sectorial aspects of the proposed AI Regulation and the interactions between the AI Regulation and existing or future sectorial safety legislation (for example the proposed new EU Regulation on machinery products), ESOs shall devote specific attention to the elaboration of standards on the methodology of risk assessment of cyber-physical products powered by AI and on the testing framework.

Actions on AI in the EU Rolling Plan for ICT Standardisation (2/2)

Action 5 SDOs should appropriately consider cybersecurity and related aspects of artificial intelligence, to identify gaps and develop the necessary standards on safety, privacy and security of artificial intelligence, to protect against malicious artificial intelligence and to use artificial intelligence to protect against cyber-attacks

Action 6 EC/JRC to coordinate with SDOs and other initiatives on developing a standardisation landscape and gap analysis for AI. This work should include recommendations for an action plan

Action 7 Stakeholders in open source to identify relevant open source projects in the field of AI, e.g. providing tools for testing, benchmarking etc.

Challenges

There are challenges ahead for regulation making use of standardisation in the area of AI

We should address the challenges in a constructive way

We should look at best practices and good examples for solving issues that are seen

Challenges – Ethics, Values and AI Standardisation



Values are set by law
and reflect ethics



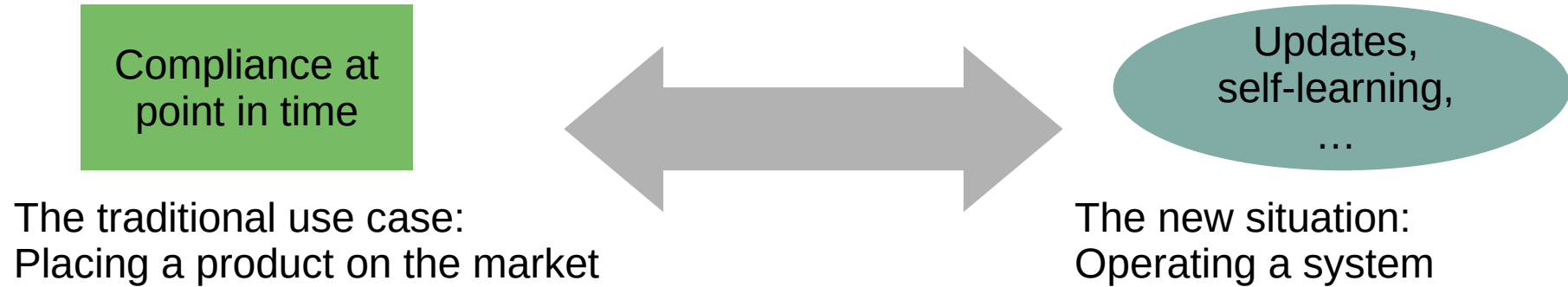
Standards provide technical
ways to fulfill requirements set
by law

Standards don't set values per se but will have to provide ways to enable operation according to values

Standards must comply with values and law and must not undermine law

Standards don't set ethics but define paths for operating in an ethical way

Challenges – Updating and Self-Learning



Standards for AI are process oriented, inter alia defining requirements for ensuring compliance of an AI system throughout the entire life-cycle

New methods for conformity assessment may have to be developed over time taking into account specifics of software systems

Difference between stand-alone AI systems and embedded AI systems

Challenges – Market Surveillance



Market surveillance is critical for the functioning of the system.

What is required so that market surveillance authorities can properly assess compliance of AI systems?

Do conformity assessment procedures need to evolve?

Which information do market authorities require (source code?; algorithms?; ...)

Where do we need to get to?

Regulators around the world should rely on international standards for addressing and supporting regulatory needs and policy objectives

Standards provide a proven method for defining the way on how technology must be built for fulfilling regulatory requirements

Standards provide a proven basis for self-assessment of conformity for bringing trusted, secure and safe technology to the market

Open Source – Complementing Standardisation

Tools and technologies developed in Open Source are available and should be considered to support and complement standardisation

Standardisation organisations and open source communities should partner on identifying areas for synergy

Community creation around standards provides for fast feedback cycles and innovative technology improvements

Collaboration is key

Experts are rare

Standards bodies need to collaborate to maximise synergy and avoid duplication of efforts

ISO/IEC JTC 1 SC 42 has a lead role internationally but should also take an obligation for promoting collaboration

New methods, e.g. open source technologies, need to be considered and partnering needs to be done

Thanks very much for your attention



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