EUROSHNET

ARTIFICIAL INTELLIGENCE
MEETS SAFETY AND HEALTH AT WORK

European standardization in support of the European Artificial Intelligence regulation

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New regulatory and standard framework on AI

ARTICULATION BETWEEN REGULATION AND STANDARDIZATION

European Commission

Standardization request

European standardization organisations
(CEN-CENELEC-ETSI)

International standardization organisations
(ISO-IEC-ITU)

AI Act

Harmonised standards

Standards

Standards
Codes of conduct

New framework

AI « horizontal » EU standardization environment

The European Commission (+ OECD and UN influence)

- AI Act: safety, security, health and protection of human rights (fairness…)
- AI liability directive:
  « allowing compensation for damage when products like robots, drones or smart-home systems are made unsafe by software updates, AI or digital services that are needed to operate the product, as well as when manufacturers fail to address cybersecurity vulnerabilities. »
- A future set of Harmonized Standards - Standardization request (draft received, official request expected by end 2022)

CEN-CENELEC/JTC 21 (Artificial Intelligence)

- Created in may 2021 – Four Working Groups – First focus on the AI Act, but will cover broader concerns (Green AI, NLP, AI nudging…)
- Adoption/Adapation of ISO-IEC standards or homegrown standards

ISO-IEC/SC 42 (Artificial Intelligence)

- Very active: More than 35 standards developped or launched, and a lot more to come
- Terminology, AI management systems, AI risk management, Trustworthiness characteristics, data quality, Use cases….
- JWG 3 on Health informatics

AI « horizontal » EU standardization environment

Sectorial considerations

- Aeronautics:
  - SAE/EUROCAE G34/WG114 (under EASA supervision in the EU)
  - ISO TC 20 – Aircraft and space vehicles
- Automobile:
  - SAE (J3016 – Taxonomy and definition)
  - ISO TC22 Road vehicles
  - ISO TC 204 Intelligent transport systems
  - UN regulations/standards
  - ITU-T, IEEE…
- Health:…

Insurance - reinsurance

- AI risk assessment based on standards before insuring products and organizations

Findings :

- **A legislative, societal and insurance environment generating a need for clear and comprehensive standards**
- **A horizontal and sectoral proliferation of standards without terminology and concepts alignment**

Request for standardization to support the AI act

Standardization request (draft)

1. **risk management system** for AI systems
2. **governance and quality of datasets** used to build AI systems
3. **record keeping -** built-in logging capabilities in AI systems
4. **transparency and information** to the users of AI systems
5. **human oversight** of AI systems
6. **accuracy** specifications for AI systems
7. **robustness** specifications for AI systems
8. **cybersecurity** specifications for AI systems
9. **quality management system** for providers of AI system
10. **conformity assessment** for AI systems

> We need a horizontal approach to unleash the potential of artificial intelligence in all areas. **A cross-cutting technology can only be effectively regulated by horizontal rules** that provide solutions to common challenges.
>
> Commissioner Thierry Breton

Criteria for EU/JTC 21 homegrown standards

- **General principle** : Use as much as possible ISO-IEC standards as long as it fits requirements

- **General context** set by the European Commission in its standardization strategy:
  - EU should be a global standard setter not just a standard taker

- **European specificities and requirements**:
  - EU values and principles
  - EU AI Act, with its timeline
  - Risk scope: Safety, health and fundamental rights… (+ environment ?)
  - Strong horizontal approach ➔ interconnection with sectorial standardization
    E.g. « explainability » concept is domain-agnostic/horizontal, « level of explanability » is domain-specific/context dependent

- **Further requirement**
  - Innovation and SMEs friendly

Standards considered for harmonization by JTC 21

- **ISO/IEC 22989:2022** Artificial intelligence concepts and terminology
- **ISO/IEC 23053:2022** Framework for Artificial Intelligence (AI) Systems Using Machine Learning (ML)
- **ISO/IEC 5259 - part 1** Data quality for analytics and machine learning (ML) Overview, terminology, and examples

Terminology

- **ISO/IEC 42001** AI management system
- **ISO/IEC 27001:2013** Information security management systems
- **ISO/IEC 23894** AI Risk Management
- **CEN-CENELEC AI Risk catalogue**

AI management system & Risk management

- **CEN-CENELEC AI trustworthiness characterisation**
- **ISO/IEC 5259 - part 2** Data quality for analytics and machine learning (ML) Data quality measures
- **ISO/IEC 5259 - part 3** Data quality for analytics and machine learning (ML) Data quality management requirements and guidelines
- **ISO/IEC 5259 - part 4** Data quality for analytics and machine learning (ML) Data quality process framework

IA & Data

Green : published
Black : in developpement

Horizontal requirements & Vertical specificities

Base line: **Strong horizontal/transversal fundationals in AI**

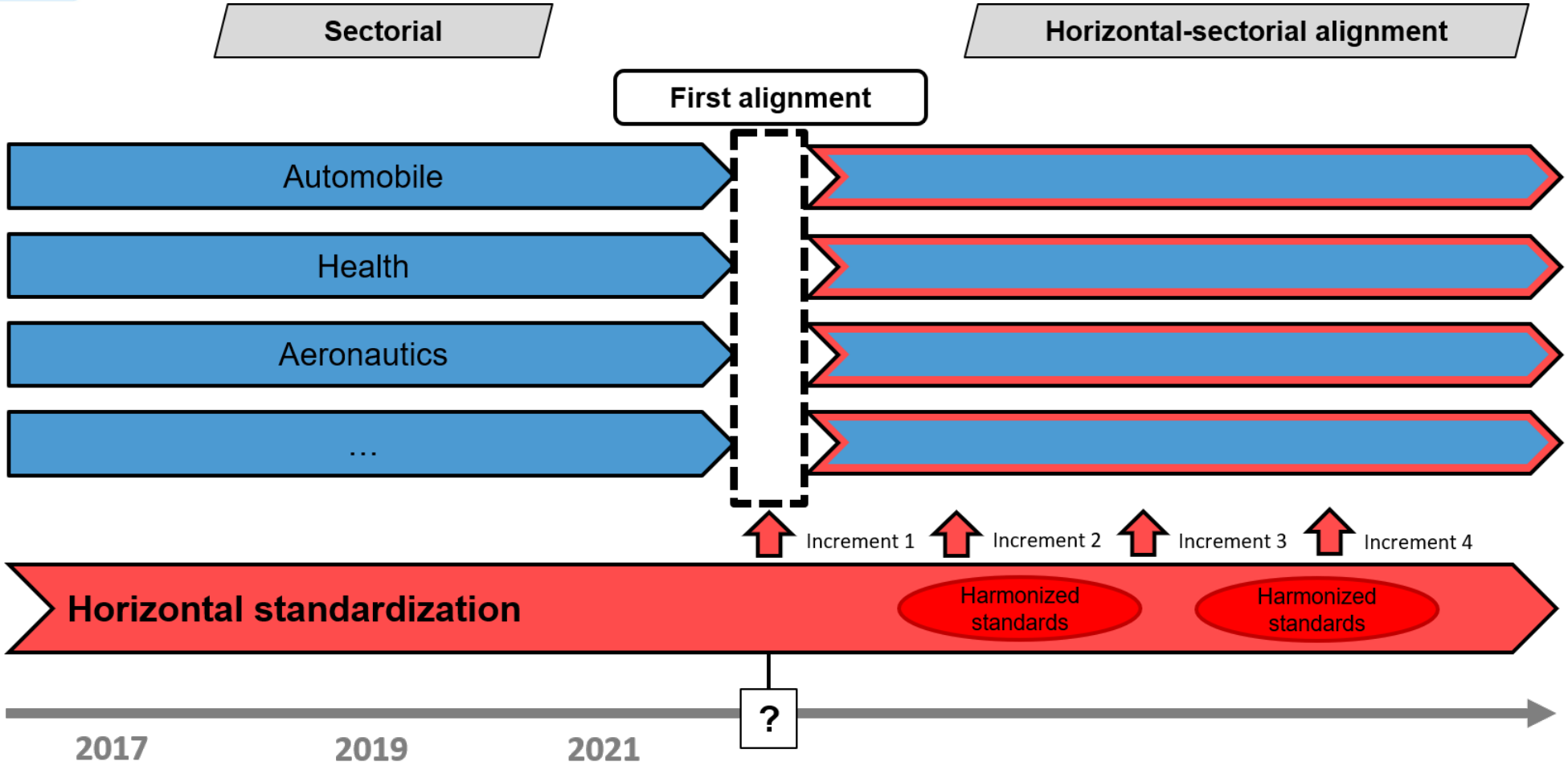
Horizontal requirements

- **Terminology/taxonomy/ontology and concepts**
- **Technical requirements frameworks (trustworthiness, metrics, control..) on AI components**
- **Risk management framework, risk catalogue (not exhaustive)**

Vertical specificities

- **Operational domain**
- **Risk assessment, domain specific risks**
- **Technical requirements on AI systems (and components)**
- **Conformity assessment schemes**

Articulation between horizontal and sectorial standardization layers



Timeframe for horizontal harmonized standards development

	2021	2022	2023	2024	2025
Regulation (AI Act)	1st Draft AI Act		AI Act Publication ?		? Entry into application
Standardization		Standardization request Draft Official ? Standardization Work plan	2nd Standardization request **Development of harmonised standards** *Develop homegrown standard* *Adopt/adapt ISO-IEC/SC 42 standards*	31/10/2024 ?	
Conformity assessment			Development of conformity assessment schemes Designation of the notified bodies		

Challenges forward

- **Coherency between horizontal standardization and sectorial standardization**
  - Common terminology on AI, Machine Learning and AI trustworthiness characteristics
- **Getting ready in time for the AI Act**
  - Anticipate mandatory conformity assessment and AI trustworthiness labelling
- **Competencies of evaluation, verification, testing, audit and certification bodies**
  - For AI systems
  - For AI management system
- **Making sure that the relevant EU stakeholders are contributing to AI standardization**
  - Consumer associations, Trade Unions, SMEs association, accreditation and certification bodies…