

standICT.eu 2026

ICT Standardisation Observatory and Support Facility in Europe

FOLLOWING THE FELLOWS

**IMPACT REPORT FROM
FUNDED APPLICANTS TO
THE STANDICT.EU 2026
FELLOWSHIP PROGRAMME**

SECOND OPEN CALL

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Disclaimer

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About StandICT.eu

The project is coordinated by [Trust-IT Srl](#) (IT) acting as a technical coordinator, and [Dublin City University](#) (IE) acting as financial coordinator, supported by its partners [AUSTRALO](#) (ES), [European Digital SME Alliance](#) (BE), [Fraunhofer](#) (DE) and [Open Forum Europe](#) (BE).



Acknowledgements

Our consortium is grateful to all experts of our StandICT.eu 2026 community for their competent work. This booklet is a tangible reflection of your continuous dedication in ICT Standardisation - Thank you!

StandICT.eu 2026 would also like to thank EC representatives **Carlos Lopez Rodrigues**, StandICT.eu 2026 Project Officer, **Paul Killeen**, **Emilio Davila-Gonzalez**, and **Thomas Reibe** for their leadership and guidance. The **External Advisory Group (EAG)** provided invaluable support throughout the course of the project. Our appreciation for their effort and commitment goes to: **Harshvardhan Pandit (EAG Chair)**, **Ana Garcia Robles**, **Antonio Kung**, **Betty XU**, **Diana Dus**, **Joel Myers**, **Karl Gruen**, **Lindsay Frost**, **Martin Chapman**, **Sandra Drechsler**, **Sebastian Hallensbelen**, **Silona Bonewald**, **Stephan Weisgerber**.

Finally, we would like to thank all our EUOS Technical Working Groups (European Observatory for ICT Standardisation) chairs and members for the investment in gathering expertise and producing outstanding landscape reports of the standardisation status across different ICT sectors.

■ Foreword

The European Green Deal & the New Industrial Strategy for Europe call for a strong EU presence in international Standardisation development. The recent significant shifts in the geopolitical environment call for increasing the intensity of the EU presence in international standardisation committees. Building up a strong and sustainable pool of European Standardisation competent professionals who are ready to engage in European and International Standardisation is crucial. With this we are pleased to contribute to this already engaged community through the “Following the Fellows” series Impact Reports, now in its 2nd edition under the new StandICT.eu 2026 project, continuing the work of the precursor edition, proving a tangible testimony of the impact generated by European ICT experts working in collaboration with international Standardisation Developing Organisations (SDOs), thanks to the financial support provided through the StandICT.eu 2026 Fellowship Programme, as paramount part of the broader mission of the StandICT.eu 2026 Coordination and Support Action.

The main purpose of these regular publications is to display the work carried out by our fellows and illustrate the demonstrable outcomes that excellent research can make to both society and to the economy (SMEs or industry at large). Therefore, we attempt to substantiate how each effort on which the fellows are engaged provides a potential benefit to society and contributes to the achievement of specific, desired, societal outcomes because of the ICT Standardisation efforts.

As we move forward, our commitment to bolstering the EU’s role in international standardisation remains strong. The “Following the Fellows” series is not only a testament to the achievements of our fellows but also serves as an inspiration and a call to action for future standardisation professionals. By highlighting the critical work of these individuals, we aim to underscore the importance of ICT standardisation in driving innovation, ensuring competitive advantages, and contributing to the sustainability and resilience of society and the economy at large.

We invite the standardisation community, policymakers, industry stakeholders, and all interested parties to engage with the insights and findings presented in these reports.

Silvana Muscella

StandICT.eu 2026 Project Coordinator
& CEO, Trust-IT Srl



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■ Introduction

This report marks the second batch of the funded fellows under the **StandICT.eu 2026 Programme**. It shares perspectives and first results of the fellowships that were funded under this second open call.

Our team is delighted to showcase the ninth series of StandICT.eu 2023 fellowship stories of the funded experts detailing the addressed standards and landscapes, how these will fill in the identified gaps as well as impact the related stakeholders and society. The results obtained by our fellows fully respond to many of the objectives set out in the EU Strategy on Standardisation. They mainly prioritise and address standardisation needs in strategic ICT areas, enhance European leadership in global standards, support innovation and, finally, improve the overall integrity of the European standardisation system.

Standards are at the core of the EU Single Market and global competitiveness and play a fundamental (even if sometimes invisible) function in our daily life. They can ensure the interoperability of products and services, reduce costs, improve safety, and foster innovation.

At the same time, standards act as powerful drivers for innovation and growth by helping researchers bring their innovation to the market and spread technological advances, as standards make their results transparent and ensure high quality. One of the key purposes of StandICT.eu 2023 is to support the activity of European ICT experts to contribute to the modernisation and consolidation of the European standardisation system as well as to the valorisation of their research outputs, with a view to efficiently respond to the EU's ambitions towards different thematic ICT areas, such as such as Metaverse and Digital Product Passport, which were the focus of the announcement of the 2nd Open Call.

The primary purpose of this document is to share the results attained through the work carried out by the funded experts, and to showcase the most relevant outcomes, creating awareness of the potential impact and repercussions of such impact on commerce, industry, governmental policies and strategies and the society. This open call is the second one out of nine StandICT.eu 2026 Open Calls. Each open call will have a dedicated impact report demonstrating the key findings, contributions, and observations with StandICT.eu community, the European Commission, the Multi-Stakeholder Platform, the SDOs, and even beyond, with all interested actors of our ever-growing StandICT.eu community.

In this funding batch, **in total 37 fellowships** were granted, tackling the five policy areas as defined in the ICT Rolling Plan 2024¹:

- ▶ **Foundational drivers: 10 fellowships** focusing on cybersecurity (9 fellowships), and data economy (1)
- ▶ **Key enablers and security: 9 fellowships** focusing on Artificial Intelligence (3 fellowships), 5G/6G (1), IoT (1), electronic identification and trust services (3), IoT (1), and Quantum technology (1).
- ▶ **Societal challenges: 3 fellowships** focusing on ethical artificial intelligence (3).
- ▶ **Innovation for Digital Single Market: 9 fellowships** focusing on blockchain (4), digitisation of European industry (1), Fin Tech and Reg tech (1), Applied AI or Big Data (2).
- ▶ **Sustainable growth: 6 fellowships** focusing on smart grids and smart metering (3), Building information modelling (1), intelligent transport systems (1), Circular economy (1).

1 <https://joinup.ec.europa.eu/collection/rolling-plan-ict-standardisation/rolling-plan-2024>

Overview of the Open Call #2

The second StandICT.eu 2026 Open Call² was launched on the 31st of July of May 2023 and closed on the 2nd of October 2023. The StandICT.eu Open Calls target European ICT standardisation experts contributing to the international SDOs, work groups and/or technical committees at any of the priority topics, as taken from the Rolling Plan for ICT Standardisation. Due to their current strategic importance at the EU level, applications focusing on the topics of Metaverse and Digital Product Passport were highly encouraged. However, this open call was completely open for applications tackling a broad range of ICT domains (as encompassed in the ICT Rolling Plan for Standardisation) and treated as equally valid.

Fellowship Profiles

This second Open Call totalled 83 eligible applications received out of which 37 were selected for funding, with an overall 326,000 Euro granted. Once more, this open call confirmed the excellent quality of most of the submitted proposals, marking a noticeably high average quality score (the minimum threshold to access funding was 7,96 score in a 1 to 10 scoring scale). The funded applications provided extensive geographical coverage with 12 different EU or associated countries (including five experts from the UK).

The retained fellowships are represented with a satisfying balance across the key technologies, and with a wide spectrum of SDOs that will benefit from the competence and expertise of the applicants. As outlined in Figure 1, a major part of the granted fellows has chosen their focus across a varied range of horizontal and vertical ICT areas; the most popular areas in this batch include artificial intelligence, cybersecurity, network and information security, and quantum

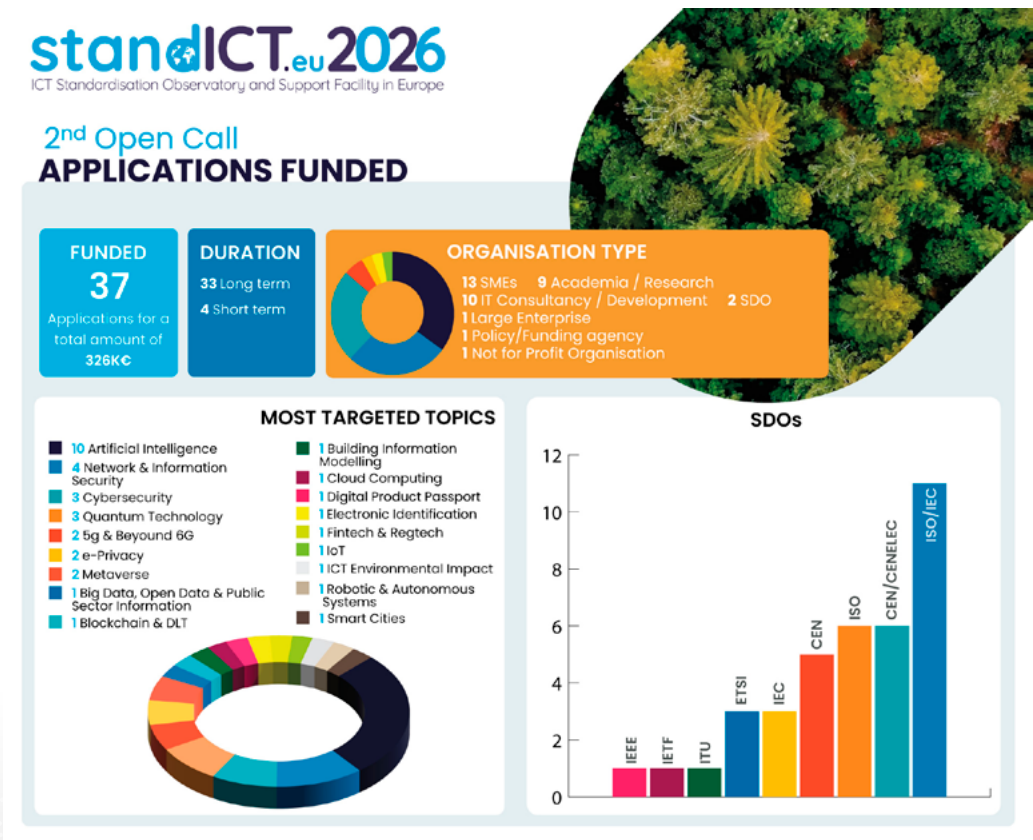


Figure 1 - Overview of the #2 Open Call key results and insights

2 <https://www.standict.eu/standict.eu-2026-2nd-open-call>

technologies. This funding batch is marked by a great variety of vertical ICT areas covered by the fellowships, namely circular economy and digital product passport that were especially encouraged topics in this call.

Five funded experts were new to the StandICT.eu programme, and the remainder were returning fellows who have already benefited from a funded StandICT.eu fellowship or fellowships in the previous programme (under StandICT.eu 2026 and /or 2023 Programmes).

Engaged SDOs, Organisations and European Projects

62% of the fellows’ activity contribute to the activities of Committees or Working Groups operating in global SDOs, including IEC, IEEE, IETF, ISO, ISO/IEC and ITU, while the remainder works with European Standardisation Organisations (ESOs), covering ETSI, CEN, CEN/ CENELEC. Finally, 15 European funded and innovation research projects (see Table 1) are related to the engaged work in the OC#2 fellowships, with a focus on different horizontal and vertical technologies.

Table 1 – EU Projects related to OC#2 Fellowships

Project	ICT Area	Funding programme	Fellow
HYCOOL-IT	IT infrastructures	HEurope	
Metrology Partnership project Metrology for emerging electromagnetic compatibility standards (21NRM06, EMC-STD)	European electromagnetic compatibility	EURAMET	Marco Azpúrua
NGI-Search	Future internet	HEurope	Leandro Navarro
Quantum Flagship	Quantum technologies	HEurope	Homer Papadopoulos
TEF-Health	eHealth	Digital Europe	João Manuel Leitão Quintas
InterConnect	Smart Grids And Energy	HEurope	Mauro Dragoni, Olivier Genest
GIFT	Smart Grids And Energy	H2020	Olivier Genest
SENDER		H2020	
MAESHA		H2020	
ENERGICA		H2020	
ENERSHARE		HEurope	
IntNET		HEurope	
SCALE		HEurope	

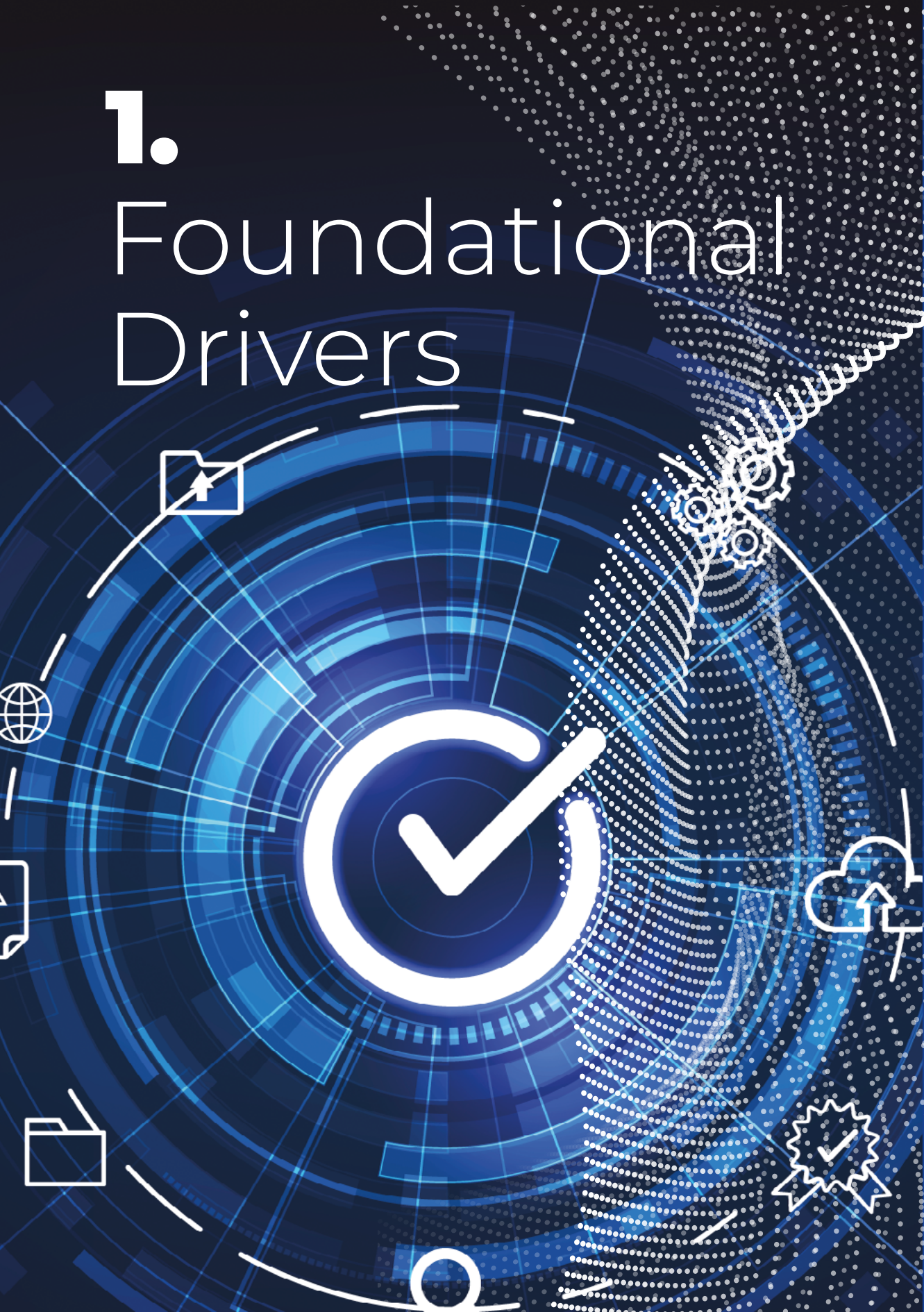
Project	ICT Area	Funding programme	Fellow
NGI Trust Chain	Trustworthy internet	H2020	Sebastian Posth
VERISIMPLEDC (NGI Trublo)	Trustable content on blockchains	H2020	

Now, we are delighted to share with you the insights from our granted fellows' work – and we truly hope that these results encourage you get involved in our StandICT.eu community and joining our Fellowship Programme under our forthcoming Open Calls, the European Observatory for ICT Standards (EUOS) - via the Technical Working Groups (TWGs) delivering up-to-date landscape and gap analysis, and finally Standards Academy training future experts in ICT Standardisation.

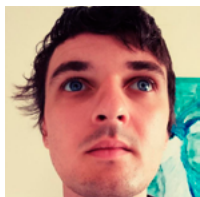
Together we shape and reinforce the European and international ICT standardisation arena!

1.

Foundational Drivers



Support to publication ETSI CYBER WI: Design practices against technology-enabled coercive control



Alex Cadzow

Senior Cybersecurity and Human Factors Researcher, Cadzow Communications Consulting Ltd.

England

Sector

Cybersecurity Network and Information Security

Engaged SDOs, WGs and TCs



ETSI TC CYBER

Role

Secretary of ETSI TC SAI and member of ETSI TC CYBER.

Addressed EU standardisation priorities and gaps

The ETSI Cyber work item on 'Implementing Design practices to mitigate consumer IoT-enabled coercive control' built upon previous work conducted in ETSI TC Cyber. With the work in question being the inclusion of a clause 'on the consideration of domestic abuse in the consumer IoT environment' as part of 'ETSI TR 103 621 Guide to Cyber Security for Consumer IoT'.

It is anticipated this work will help companies consider what measures they might need to take to meet stronger requirements for online safety which have recently come to the fore with recently passed and upcoming legislative acts within the EU and globally.

These include a non-exhaustive list the; UK Online Safety Bill, intended to improve internet safety; EU Digital Services Act, to modernise the e-Commerce Directive regarding illegal content, transparent advertising, and disinformation; Australian Online Safety Act 2021, expands protections against online harm, to keep pace with abusive behaviour and toxic content; France's Law no. 2022-300 (through the publication of the Decree no. 2022-1212), intended to protect minors and make it easier for parents to block online access.

The work was published as an ETSI Technical Report (TR) in January 2024 for it to be used for guidance to ETSI in general on the handling of specific technical standardisation activities. In this case, the design practices that guide the development of measures that allow some degree of mitigation in both the devices themselves and in the services that the devices support against coercive control.

Concerned ICT Standards and contribution to the related landscape

This ETSI TR identifies design practices that guide the development of measures that allow some degree of mitigation in both the consumer IoT devices themselves and in the services that the devices support against coercive control. The document was developed to guide manufacturers on the implementation of Coercive control resistant and Trauma informed design, by providing non-exhaustive examples of practical solutions that can be used to meet these measures. It is hoped this TR will aid to improve the safety of IoT devices without weakening security and privacy protections, while also ensuring manufacturers and service providers can meet requirements under various online safety acts.

Impact (on European SMEs, related projects or in society)

Impact on SMEs

This ETSI TR aims to provide information to SMEs to help them implement design practises to mitigate consumer IoT-enabled coercive control if they design and/or sell consumer IoT products or services.

Impact on Society

Everyday Consumer IoT products that are, for the most part, taken for granted within personal relationships, can be repurposed for coercive control. This coercive control creates trauma, both when it is being experienced, and in its aftermath. It is imperative that organisations involved in creating Consumer IoT products understand the potential ramifications of their products and services, raise awareness and adopt authentic trauma-informed approaches to their business practices. As such, the 'ETSI TR 103 621 Guide to Cyber Security for Consumer IoT' provides guidance in the two related spheres of coercive control resistant design and trauma informed practice.

Has your project directly involved or led to a specific recommendation or proposal for developing new or revised standards?

Yes, I contributed to the development of a new standard TR 103 936 V1.1.1 (2024-01) Implementing Design practices to mitigate consumer IoT-enabled coercive control.

Have the standardisation activities in your project led to specific deliverables?

Yes, I contributed to a technical report.

What future efforts or activities are still necessary for your area of application?

The general plan and consensus within ETSI TC Cyber is that the published "TR 103 936 V1.1.1 (2024-01) Implementing Design practices to mitigate consumer IoT-enabled coercive control" will be updated and revised as new research and improved design practises emerge.

Online references related to the fellowship work

 www.etsi.org/deliver/etsi_tr/103900_103999/103936/01.01.01_60/tr_103936v010101p.pdf

Managing last steps ISO/IEC 27031 revision, European experts and liaisons inputs within the project



Thierry Maxime

Information Security Consultant, TRAX
France

Sector

Cybersecurity Network and Information Security

Engaged SDOs, WGs and TCs



ISO/IEC JTC1 SC27 WG4 “Security controls & services”, WG1
“Information security management systems”, TC 292 WG2
“Continuity and organisational resilience”, CEN/CENELEC JTC 13 WG2
“Management systems and controls sets” and WG4 “Cybersecurity services”

Role

Expert

Addressed EU standardisation priorities and gaps

My fellowship addresses challenges related to the last steps of the 27031 revision, which concern several aspects and in particular the gaps in the consensus at SC27 level and the appropriate level of recommendations to enable organisations to deepen their understanding and structuring of the details constituting information security continuity as part of their business continuity framework. About the consensus, this type of gap is relatively common in this type of work and consists above all finding an agreement between the different experts forming the round table to find the critical path based on the proposals which have been formulated beforehand. The formulation of the comments is the previous step of the international consensus, and it is the work conducted at the French level that is reflected, allowing the positioning of the support to small and medium-sized enterprises. Managing the consensus is therefore a challenge of explaining the distinct positions and demonstrating the usefulness of the evolution of the text. Hence, the priority of my fellowship is to manage the last steps of the 27031 revision, is first to ensure the compliance with the rules keeping in mind that we want to keep clarity to produce a document and content that is useful for the organisations and beneficial for the stakeholders (the end users of the services provided by the companies or organisations implementing business continuity preparedness principles).

Concerned ICT Standards and contribution to the related landscape

My fellowship contributed to revising ISO 27031. It is a standard that develops ICT readiness, which is of main importance in business continuity management implementation in accordance with information security within organisations. Indeed, this work is essential for organisations facing increasing risks and threats in an unstable environment when they rely more and more on ICT, supplying them guidance to gain more resilience to infrastructures and organisations.

For that purpose, this fellowship allows me to dedicate enough time working with my co-editors and consider international experts' contributions and inputs in the revision process.

Moreover, with this fellowship, I prepared and facilitated sessions related to ISO 27031's revision project and secured my participation in all the dedicated meetings on one hand, but also, on the other hand ISO 27035-x projects meetings (incident management) as a subject directly linked to ISO 27031 matter.

Impact (on European SMEs, related projects or in society)

Impact on SMEs

My work has a direct impact on SMEs, due to the participation of a liaison in my work on the revision of ISO 27031, Small Business Standard (SBS), a very active liaison with whom we have regular exchanges in order to adapt the result of the text not specifically to the SME, but so that it can be adapted for these structures, to enable them to better prepare and adapt their solutions, their information & communication readiness plans for business continuity.

Impact on Society

As per its business plan (SC27 N22264), ISO/IEC JTC1 SC27 states to contribute with 23 standards to the following Sustainable Development Goals (SDG) of the United Nations:

- ▶ SDG 8 Decent work and economic growth
- ▶ SDG 9 Industry, innovation and infrastructure
- ▶ SDG 11 Sustainable cities and communities

Has your project directly involved or led to a specific recommendation or proposal for developing new or revised standards?

Yes, this fellowship allowed me to prepare and facilitate sessions related to ISO 27031's revision project and to secure my participation in all the dedicated meetings on one hand, but also, on the other hand ISO 27035-x projects meetings (incident management) as a subject directly linked to ISO 27031 matter. And this, even if most of them take place very early or very late in the day respecting ISO scheduling rules. While being able to provide standards-based advice, especially to SMEs that must comply with ISO 27001 certifications and that for the most part have many questions around the topic of ICT infrastructure resilience in their security and continuity strategy.

Have the standardisation activities in your project led to specific deliverables?

Yes, I have contributed to drafting an International Standard (IS).

What future efforts or activities are still necessary for your area of application?

All the work carried out up to mid-2024 should lead to the finalisation of the work, having met the various requirements, and wishes of interested parties by having found a consensus.

Online references related to the fellowship work

 <https://committee.iso.org/sites/jtc1sc27/home/projects.html>

 <https://www.iso.org/fr/standard/80975.html>

Key Management and Public-key infrastructure: Establishment and maintenance



Erik Andersen

*Contributor and project editor, Andersen's L-Service
Denmark*

Sector

Cybersecurity Network and Information Security

Engaged SDOs, WGs and TCs



ISO/IEC JTC 1/SC 27 WG 2, "Cryptography and security mechanisms"

Role

Member

Addressed EU standardisation priorities and gaps

The priority of this fellowship targets the extension of cybersecurity capabilities. Cryptographic algorithms play a key role within cybersecurity. It is a quite complex area requiring good technical understanding. Cryptographic algorithms are specified in separate detailed specifications developed by NIST, IETF CFRG (Crypto Forum), and ISO/IEC JTC 1/SC 27/WG 2. These specifications are very technical requiring detailed mathematical knowledge to understand. There is a need for a single document that gives an overview of these specifications at a reasonable technical level not requiring advanced mathematical knowledge, but with references to more detailed specifications.

Public-key infrastructure (PKI) being dependent on cryptographic algorithms also plays an important role within cybersecurity. There is a requirement for a "best practice" document to be used by organisations establishing PKI and to be referenced by other standards.

The challenge is that it is a large undertaking and time-consuming activity to fulfil above mentioned requirements at the right technical level.

Concerned ICT Standards and contribution to the related landscape

The ICT standard subject for this fellowship is a new part of a series of standards developed jointly by ITU-T Study Group 17 Question 11 and ISO/IEC JTC 1/SC 6/WG 10. On the ITU-T side, the joined text is referred to as the ITU-T X.500 series of Recommendations and on the ISO/IEC JTC 1/SC 6 side the joined text is referred to as ISO/IEC 9594-all parts. All meetings are common meetings independent of what organisation is hosting. I participate in both ITU-T Study Group 17 meetings and ISO/IEC JTC 1/SC 6/WG 10 meetings, while being the common project editor for both organisations.

The new part under development will on the ITU-T side be called ITU-T X.508 and on the ISO/IEC side be called ISO/IEC 9594-12 and title will be "Key management and public-key infrastructure establishment and maintenance".

Rec. ITU-T X.509 | ISO/IEC 9594-8 is the framework for public-infrastructure and is considered one of the most important cybersecurity standards. Rec. ITU-T X.508 | ISO/IEC 9594-12 extends the cybersecurity scope together with ITU-T X.510 | ISO/IEC 9594-11 to also cover the environment within which Rec. ITU-T X.509 | ISO/IEC 9594-8 operates.

Impact (on European SMEs, related projects or in society)

Impact on Society

Much security attention, especially in Europe, is on procedural cybersecurity where NIS2 is dominating the cybersecurity activity. NIS2 is about people and organisation and how they act in a hostile world. There is almost a religious belief in NIS2. Today's ICT networks are characterised by having many devices communicating without human intervention. This is the case for critical infrastructures and for networks with a large number of Internet of Things (IoT) devices. In these environments, communication is between devices, also called machine-to-machine communication. The number of devices in these areas vastly outnumbers the number of human beings and this area is almost unprotected, which could have detrimental effects on our society.

It is the hope that the project could be one way to enable a broader cybersecurity protection.

Has your project directly involved or led to a specific recommendation or proposal for developing new or revised standards?

It is a new standard and will be known as Rec. ITU-T X.508 | ISO/IEC 9594-12, Key management and public-key infrastructure establishment and maintenance.

Have the standardisation activities in your project led to specific deliverables?

As part of the project the ballot procedures have required generation of ballot comment to improve the content and editor preparing the updated text. Currently, the text for a second Draft International Standard (DIS) vote has been prepared and sent to ISO central secretariat for initiating the ballot.

What future efforts or activities are still necessary for your area of application?

When the ballot starts or even already now, new substantial comments to finalise the document will be developed to make it ready for approval at the next ITU-T Study Group 17 meeting. After that, work will start on a new edition to include a section on quantum safe cryptographic algorithms and some other enhancements.

Online references related to the fellowship work

There are two PowerPoint presentation that may be downloaded that have been reflected in the standard being the subject for the fellowship work:

📎 A presentation on PKI establishment and maintenance to be downloaded [here](#).

📎 A presentation on cryptographic algorithms to be downloaded [here](#).

Participation in the standardisation work at the ESOs for the Cyber Resilience Act proposal



Octavian Popescu

Consultant, researcher, EUCOMREG

Belgium

Sector

Cybersecurity Network and Information Security

Engaged SDOs, WGs and TCs



CEN / CENELEC JTC13 Cybersecurity and data protection WG 9
Special Working Group on Cyber Resilience Act

Role

Member

Addressed EU standardisation priorities and gaps

My goal with this fellowship is to participate in the standardisation activities undertaken in the European Committee for Standardisation and the European Committee for Electrotechnical Standardisation (CEN-CENELEC) for the proposal made by the European Commission for a Regulation on horizontal cybersecurity requirements for products with digital elements and amending Regulation (EU) 2019/1020 (the Cyber Resilience Act). This European Commission (EC) proposal aims at improving the security of the products with digital elements (software and hardware) that are placed on the market and aims at allowing users to take cybersecurity into account when selecting and using products with digital elements.

The priority is to support the production of standardisation deliverables covering the CRA requirements.

The relevant gap is that there is no single horizontal standard that would satisfy even one of the cybersecurity requirements for which radio communications equipment must be assessed for compliance before being placed on the European market.

As the CRA is a new legislation imposing essential requirements onto equipment placed on the EU single market, it is currently unclear if all these essential requirements may be covered by harmonised European Norms.

Concerned ICT Standards and contribution to the related landscape

This fellowship enables me to contribute to the debate to produce standardisation deliverables. While CEN-CENELEC responded positively to the EC regarding a possible standardisation request, currently only exploratory work is done in JTC 13, in the new group WG9. This is where I can present the views and propose opinions from a personal perspective inspired from my work with several innovative SME and organisations representing different technology communities, based on my experience and prior discussions. Obviously, there is no published ICT standard fit for the purpose of covering the CRA requirements.

Impact (on European SMEs, related projects or in society)

Impact on SMEs

In general, my participation in the CRA standardisation work undertaken in CEN-CENELEC and ETSI aims at helping produce such documents that will enable manufacturers to implement measures to enhance their product cybersecurity and meet the legal requirements for the EU single market. At this stage however, I aim to clarify the objectives and expectations for the CRA, because the process of producing this type of requirements has yet to be sufficiently well defined because it is the first time this is attempted.

Impact on Society

The desired impact on European society and not only is to find means of improving the resilience of the network from a cybersecurity perspective.

Has your project directly involved or led to a specific recommendation or proposal for developing new or revised standards?

Currently only exploratory work is done in JTC 13, in Working Group WG9. Once the Standardisation Request is adopted, and the work item is approved by the European Standardisation Organisations, this may become a horizontal CRA harmonised standard.

Have the standardisation activities in your project led to specific deliverables?

Not yet. However, this is an ongoing discussion within the expert community, and it is not yet clear what sort of standardisation deliverables would result as output.

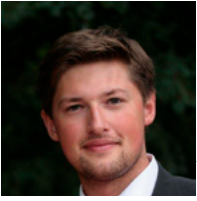
What future efforts or activities are still necessary for your area of application?

As mentioned, this is an ongoing discussion, and everything is yet to come in terms of concrete actions. Therefore, I suggest a continuation of the engaged activities for the purpose of having a stable pool of experts participating in the current debate and future work.

Online references related to the fellowship work

 https://standards.cencenelec.eu/dyn/www/f?p=205:7:0:::FSP_ORG_ID:2307986&cs=1BFE244DDA2A68D1B5C93795034A8DD05

Advance Biometric System-On-Card (ISO/IEC 17839) Standard improvement



Pavel Cuchriajev

*Technical expert contributor; Standard Norge
Lithuania*

Sector

Cybersecurity Network and Information Security

Engaged SDOs, WGs and TCs



ISO/IEC SC17 WG11 Application of biometrics to cards and personal identification

Role

Member

Addressed EU standardisation priorities and gaps

My fellowship aims to highlight the necessity of the Biometric System-on-Card architecture, which ensures the secure identification of individuals and authorisation of transactions while upholding citizens' privacy. This architecture finds applications in diverse sectors, including payments, access control, and e-identity. The ISO/IEC 17839 series of standards establish essential requirements and boundaries for vendors to comply with, fostering interoperability and benefitting users and small and medium-sized enterprises (SMEs).

Concerned ICT Standards and contribution to the related landscape

My fellowship significantly contributes to the ICT standards landscape by advancing the Biometric System-on-Card (BSoC) standards, particularly within the ISO/IEC 17839 series. By enhancing these standards, the application ensures BSoC technology aligns with industry best practices, promotes interoperability, and addresses emerging challenges. The application's involvement in ISO/IEC SC17 WG11 facilitates collaboration among industry stakeholders, promoting the adoption of standardised BSoC solutions. Specific ICT standards addressed include ISO/IEC 17839 series, ISO/IEC 24787, and ISO/IEC 7816-11. These standards define essential requirements for BSoC technology, ensuring secure identification and transaction authorization while preserving privacy. By contributing to the development of these standards, my contribution plays a pivotal role in shaping the ICT standards landscape, promoting innovation, security, and interoperability in BSoC technology.

Impact (on European SMEs, related projects or in society)

Impact on SMEs

The standard series underpins application standards, especially in finance, outlining essential industry compliance requirements for a balanced fusion of security and usability. It's pivotal for small and medium-sized enterprises (SMEs) to contribute to broader solutions.

Prioritising data security, the proposal emphasises e-privacy by design. Personal data is exclusively processed on individual devices, not centralised databases. This initiative includes electronic identification and signatures, ensuring secure user identification through standardised technology. The BSoC generates tamper-proof e-signatures, ensuring non-repudiation via secure biometric user authentication.

Driven largely by European entities, advocating for European industry interests is crucial to

secure enhanced privacy and interoperability benefits for European citizens. These elements foster heightened privacy and a diversified landscape, underscoring the importance of openness and interoperability.

Impact on Society

The work supported societal impacts by enhancing security and privacy, facilitating access to services, supporting digital transformation, promoting innovation and economic growth, and protecting individual rights in the digital age.

The driving force behind the standards largely comes from European entities. It is crucial to advocate for European industry interests within this standard series to ensure the benefits of improved privacy and interoperability for European citizens. These factors contribute to enhanced privacy and a diversified landscape, reinforcing the significance of openness and interoperability.

Has your project directly involved or led to a specific recommendation or proposal for developing new or revised standards?

Yes, I contribute to three new standards, including ISO/IEC 17839-2, ISO/IEC 17839-1, ISO/IEC 17839-3.

Have the standardisation activities in your project led to specific deliverables?

No.

What future efforts or activities are still necessary for your area of application?

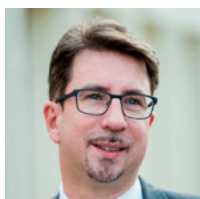
In general, the maturity of the standards varies: 17839-1 is still under development and requires further discussion and refinement, while 17839-2 is nearing completion with comments addressed. However, 17839-3 has yet to undergo substantial discussion.

Online references related to the fellowship work

 <https://www.iso.org/committee/45144.html>

 <https://www.iso.org/committee/45144/x/catalogue/p/0/u/1/w/0/d/0>

Developing cybersecurity standardisation for Artificial Intelligence and Internet of Things



François Lorek

CEO, TRAX

France

Sector

Cybersecurity Network and Information Security

Engaged SDOs, WGs and TCs



ISO/IEC JTC1 SC27 AHG3 AI & BD related Cybersecurity & Privacy coordination

ISO/IEC JTC1 SC27 WG4 Security controls and services

ISO/IEC JTC1 SC27 AHG2 IoT & Digital Twin related Cybersecurity & Privacy projects

ISO/IEC JTC1 SC27 WG1 (ISO 2700x family of standards)

ISO/IEC JTC1 SC27 WG5 Identity management and privacy technologies

ISO/IEC JTC1 SC42 Artificial intelligence Working Groups

CEN/CENELEC JTC13 Cybersecurity and data protection WG2, WG4 and WG5

CEN/CENELEC JTC21 Artificial intelligence WGs

Role

Convenor of ISO/IEC JTC1 SC27 Information security, cybersecurity and privacy protection AHG3 (AI & BD related Cybersecurity & Privacy coordination)

Convenor support of ISO/IEC JTC1 SC27 WG4 and of AHG2 (IoT & Digital Twin related Cybersecurity & Privacy projects) and member in other groups

Addressed EU standardisation priorities and gaps

Coordination and synchronisation between technical committees and working groups is one of the biggest challenges to face with lots of meetings on various interdependent topics (cybersecurity & privacy, artificial intelligence, ...) with several initiatives with different schedules at different international/European and national scales. Priorities are given mostly by the European Commission, the SDO's directives, the market's expectations, and the maturity of consensus between experts. Hopefully, lots of experts (especially European) are taking part to several cross work across TC's, SC's and WG's especially between AI (CEN/CENELEC JTC 21 & ISO/IEC JTC1 SC42) & Cybersecurity & Privacy (CEN/CENELEC JTC13 & ISO/IEC JTC1 SC27). At SC27 level, it is the reason for the establishment of Adhoc Group3 to ensure coordination on Artificial Intelligence (AI) and Big Data (BD) related security and privacy projects.

Concerned ICT Standards and contribution to the related landscape

The support of this fellowship is concerning Cybersecurity & Privacy standardisation activities and projects related to Artificial Intelligence, whilst following the progress of AI standardisation work to ensure a global coherence and consistency.

Impact (on European SMEs, related projects or in society)

Impact on SMEs

Many small and medium companies are about to be impacted by Cybersecurity & Privacy standards or Artificial Intelligence, or are concerned by Cybersecurity & Privacy within Artificial Intelligence, with a need to make their market and potential customers confident.

Impact on Society

In a context of rapid and popular emergence of artificial intelligence-based technologies, it is only natural that they should arouse both infatuation and passion, and therefore that many concerns should also emerge on the part of businesses and civil society alike. Regulations are beginning to emerge, but they need standards to set a framework and define the acceptable limits of use to reap the benefits and progress of these new innovations. Cybersecurity standards, particularly when they relate more specifically to the lifecycle of artificial intelligence-based technologies, are just as crucial to ensuring the serene development and confident use of these innovations. The work being carried out under the guidance of the officers of which I am a member is helping to reassure businesses and civil society alike as to how confidence can be guaranteed, and how drifts can be avoided by providing maximum protection against today's growing threats.

Has your project directly involved or led to a specific recommendation or proposal for developing new or revised standards?

Yes, I contribute directly to the development of the following new standards:

- ▷ ISO/IEC 27042:2015 IT - Security techniques — Guidelines for the analysis and interpretation of digital evidence
- ▷ ISO/IEC 27037:2012 IT - Security techniques — Guidelines for identification, collection, acquisition and preservation of digital evidence

Have the standardisation activities in your project led to specific deliverables?

Yes, my standardisation activities have contributed directly to the progress or publishing of the following standards:

- ▷ ISO/IEC 27040:2024 IT - Security techniques — Storage security
- ▷ ISO/IEC 27402:2023 Cybersecurity — IoT security and privacy — Device baseline requirements
- ▷ ISO/IEC 27071:2023 Cybersecurity — Security recommendations for establishing trusted connections between devices and services
- ▷ ISO/IEC CD 27090 Cybersecurity — Artificial Intelligence — Guidance for addressing security threats and failures in artificial intelligence systems

What future efforts or activities are still necessary for your area of application?

There is still a lot to do as the first regulations regarding AI just came out in Europe whilst Cybersecurity regulations are also developed to reinforce resiliency. We have just opened a new promising area of IT with AI based technologies and innovation, but we are expecting new issues and concerns to arise with the development of AI applications and standardisation activities must keep working refining and revising existing standards or developing new projects to keep a trusted environment for the secure development of these emerging technologies.

Online references related to the fellowship work

 <https://www.iso.org/committee/45306.html>

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

 <https://www.cencenelec.eu/areas-of-work/cenelec-sectors/digital-society-cenelec/cybersecurity-and-data-protection/>

 <https://www.cencenelec.eu/areas-of-work/cen-cenelec-topics/artificial-intelligence/>

Contribution to e-identification and e-authentication at CEN/CLC/JTC 13 & ISO/IEC JTC1/SC 27 WG5's



Christophe Stenuit

*Independent expert, Viewconcept.be
Belgium*

Sector

Cybersecurity Network and Information Security

Engaged SDOs, WGs and TCs

ISO/IEC JTC 1/SC 27 WG5 on Identity management and privacy technologies



CEN/CLC/JTC 13 WG5 on Data Protection, Privacy and Identity Management

Role

Editor of and contributor

Addressed EU standardisation priorities and gaps

My fellowship aims to positively influence the European market and its infrastructures by benefiting from international contributions (e.g. ISO/IEC) in the controlling of civil security and the protecting of e-identity and e-privacy. My contributions enhanced existing references, and encouraged promoting the use of these references through adoption in the European market.

Concerned ICT Standards and contribution to the related landscape

This project contributes to a better harmonisation of e-identity and privacy protection standardisation support in Europe. It contributes to ease the implementation of e-identity and e-privacy developments.

The scope of the proposed standardisation activity includes proposing and revising standards. Hence, progress was made on the following ICT standards:

- ▷ ISO/IEC 24760-1 about identity management terminology and concepts
- ▷ ISO/IEC 24760-2 about identity management architecture
- ▷ ISO/IEC 24760-3 about identity management practices
- ▷ ISO/IEC 24760-4, about identity management and credentials, authenticators and authentication
- ▷ ISO/IEC 29146 about access management amendment
- ▷ ISO/IEC 29115 about Entity authentication assurance framework
- ▷ Integration of the referred standards with their amendments
- ▷ Adoption of the referred standards as prEN

I also carried out other supporting activities, e.g. contributions on supporting standardisation activities in relation to, as part of the ISO JTC1 SC27 WG5, including the following:

- ▷ AG5 on strategy
- ▷ Development of threats associated with digital authentication and possible controls
- ▷ Development of an entity authentication assurance framework (ISO/IEC 29015 rework)

- Analysis of identification and authentication processes
- And as part of the CEN/CLC/JTC 13/WG 5:
- Contribution to the establishment of a Liaison Statement of ISO/IEC JTC 1/SC 27 WG 5 to CEN-CENELEC JTC13.

Impact (on European SMEs, related projects or in society)

Impact on SMEs

Today, SMEs are better aware of risks and of controls required in IT and information protection. Recent EU GDPR, eIDA2 regulations and NIS-2 directives developments impose a different view on IT risks, information security, data privacy protection and identity management controls, and by this a different awareness of the consequences that may fall improper compliance to good practices. Therefore, good standard references help establish confidence and maturity improvement in matters yesterday, far from SMEs' concerns.

Impact on Society

My contributions impact the society from three different angles:

- Secure societies - protecting freedom and security of Europe and its citizens: Supporting standards on e-identity and e-privacy information management ensures identity information lifecycle, identification, bound proofed identity information and authentication of citizen and societies are in place before authorised accesses to services is provided without compromising their privacy.
- Cybersecurity, network and identity information security: Standards on reference architectures around e-identity and e-privacy management ensure information infrastructure has the required controls in place to protect citizens and societies while accessing and using provided services.
- ePrivacy protection: Data protection good practice ensures any risk on identity information is mitigated during the processing of the information.

Has your project directly involved or led to a specific recommendation or proposal for developing new or revised standards?

Part of the objectives of the project is to support systematic reviews, revisions, and amendments of existing work items, and another is to support the adoption and the publicity of these work items at the EU market, and by this guaranteeing the sustainability of existing references in a changing world.

Have the standardisation activities in your project led to specific deliverables?

No, as I focus on revising and updating existing documentation.

What future efforts or activities are still necessary for your area of application?

In my area of expertise, most developed texts are achieving maturity. The referred work items are being more and more used or referred to in the industry. Some efforts are still required to achieve publications. This could take up to 18 or 24 months. This activity will continue over 2024, and achieve publications during 2024, and 2025.

Online references related to the fellowship work

 www.iso.org/committee/45306.html

 https://standards.cencenelec.eu/dyn/www/f?p=205:7:0:::FSP_ORG_ID:2307986&cs=1BFE244DDA2A68D1B5C93795034A8DD05

IoTDisco: Strong yet Lightweight End-to-End Security for the Internet of Constrained Things



Johann Groszschadl

*Software developer, University of Luxembourg
Luxembourg*

Sector

Cybersecurity Network and Information Security

Engaged SDOs, WGs and TCs



IETF Working Group for the Lightweight Authenticated Key Exchange (lake) and/or the Light-Weight Implementation Guidance (lwig)

Role

Expert member

Addressed EU standardisation priorities and gaps

Improving security is one of the most, if not the most, important priorities for the evolution and future development of the IoT. A key enabler for many modern IoT applications are protocols for End-to-End (E2E) secure communication over an insecure network, e.g., TLS and its datagram variant DTLS. Unfortunately, (D)TLS is very computation-intensive and introduces significant communication overheads, making it impractical for resource-constrained IoT devices like miniature sensor nodes. The recently introduced Disco protocol is a promising alternative to (D)TLS since it is basically a “clean-slate” approach to achieve E2E security with low complexity and no legacy overheads.

Although two prototype implementations of the Disco protocol are publicly available, there are still several open questions about its real-world performance, especially on resource-constrained devices. These gaps in the existing body of knowledge on Disco are because these prototypes were written in high-level languages, namely C and Go, and lack architecture-specific optimizations for the performance-critical components. Therefore, it is still unclear what execution time an optimised Disco implementation with carefully tuned Assembly code for the underlying cryptosystems can reach.

Developing an optimised implementation of the Disco protocol is a challenging task and requires specific expertise in both software engineering and cryptography. The main outcome of this fellowship is an optimised Disco prototype for 16-bit MSP430 microcontrollers that contains Assembly code for the underlying cryptosystems, namely the X25519 key exchange scheme and the Xoodoo permutation. This optimised prototype outperforms existing Disco implementations by a factor of more than 25 and, in this way, contributes to a better understanding of where Disco can position itself in the current landscape of standardised E2E protocols for the IoT.

Concerned ICT Standards and contribution to the related landscape

The current de-facto standard for E2E-secure communication on the Internet is TLS (specified in RFC 8446) and its datagram variant DTLS (RFC 9147). However, both protocols are not really suitable for resource constrained IoT devices due to their high complexity, which causes significant overheads in terms of computation and communication cost. Other standardised E2E security protocols, including ones that were designed with the IoT in mind (e.g., the so-

called Diet EXchange (DEX) variant of the IETF Host Identity Protocol (HIP, RFC 7401) and the Ephemeral Diffie-Hellman Over COSE (EDHOC) protocol, draft-ietf-lake-edhoc-23) are also relatively complex due to, e.g., algorithm agility (i.e., the ability to support different cryptographic primitives with different levels of security). EDHOC uses cryptosystems that are now dated and efficiency-wise not state-of-the-art anymore (e.g., ECDH with NIST curves). Disco, on the other hand, is extremely minimalist since it supports only a single algorithm for key exchange (namely X25519) and a single primitive for bulk encryption and integrity protection (namely a cryptographic permutation).

The IoTDisco software developed with support of this fellowship is not only 25 times faster than previous Disco prototypes but compares also very favourably with optimised implementations of HIP-DEX and EDHOC. For example, IoTDisco executed on a 16-bit MSP430 microcontroller outperforms a HIP DEX implementation running on a more powerful 32-bit ARM9 microcontroller by a factor of roughly 7.4 and is more than an order of magnitude faster than EDHOC on an ARM Cortex-M0 device (the full details and results can be found at <https://github.com/JohGroLux/IoTDisco/tree/main/papers>). These results contribute to a better understanding where Disco can be positioned in the existing standards landscape of secure E2E protocols for the IoT.

Impact (on European SMEs, related projects or in society)

Impact on SMEs

Even though the Disco protocol is not yet used in real-world products, the underlying cryptographic primitives, e.g., X25519, are standardised and widely deployed. Therefore, the MSP430-Assembly optimizations developed during this fellowship can be useful for European companies in the IoT space, including SMEs. Even though the MSP430 architecture is owned by Texas Instruments, it was developed at the German subsidiary of Texas Instruments. Two major providers of toolchains for MSP430, namely IAR and Rowley, have their headquarters in Europe. MSP430 microcontrollers are deployed in thousands of IoT devices of European companies in all segments of the Embedded/IoT industry, ranging from automotive appliances over industrial control systems to medical devices. Many of the companies that designed and/or manufactured these devices are SMEs. They will benefit from this project and the developed source code, which is freely available under an open-source licence.

Impact on Society

The poor state of security in the IoT is a massive problem that constantly plagues individual users as well as organisations and enterprises. This project has contributed to improve the security of the IoT since cryptographically strong E2E protocols are the foundation upon which secure architectures, systems and protocols can be built. E2E protocols are of course only one of many aspects that determine the real-world security of an application or system, but it is an essential one since without E2E protocols it would be next to impossible to ensure secure communication. However, to be suitable for deployment in IoT devices, an E2E protocol does not only need to be secure, but it must also be efficient. Efficiency is particularly important for resource-constrained embedded/IoT devices (e.g., RFID tags, sensor nodes, or smart cards) that are extremely limited in terms of computational power, memory, and energy supply. The poor state of security in the IoT world is not only caused by ignorance and bad development practices, but also (in part) by the fact that cryptographic algorithms and protocols can have a significant negative impact on the execution time, RAM footprint, and energy consumption of an application running in an IoT device. Therefore, it is crucial that E2E protocols considered for standardisation are carefully evaluated to have detailed information about their efficiency on many different platforms. This project has contributed to a better understanding of the performance of Disco protocol on 16-bit MSP430 microcontrollers.

Has your project directly involved or led to a specific recommendation or proposal for developing new or revised standards?

Not yet. This fellowship focuses on laying a common ground for the next steps towards the standardisation of Disco, which will be discussed at the IETF119 meeting.

Have the standardisation activities in your project led to specific deliverables?

Yes, I have contributed to several technical reports on reference data and on recommendations for a new standard.

What future efforts or activities are still necessary for your area of application?

The goal of this fellowship was to initiate and contribute to the development of an IETF standard for the Disco protocol for resource constrained IoT devices. IETF standardisation activities follow the approach of “rough consensus and running code,” but in most cases the “running code” must be developed first in order to assess the efficiency of a protocol. A protocol targeting the IoT and resource-constrained devices requires an efficient implementation in terms of code size and RAM footprint so that it can run on devices with very limited computational resources. Now that an optimised implementation exists and the execution time, RAM consumption and binary code size of the Disco protocol is known, the next steps towards the standardisation of Disco will be discussed at the IETF119 meeting. Depending on the outcome of these discussions, further support from StandICT will potentially be requested.

Online references related to the fellowship work

📁 GitHub repository of the IoTDisco prototype: <https://github.com/JohGroLux/IoTDisco>

📄 Research paper on IoTDisco presented at MSPN 2023: https://link.springer.com/chapter/10.1007/978-3-031-52426-4_1

Protocols for cybersecurity evaluation and testing under RED cybersecurity essential requirements



Octavian Popescu

*Consultant, researcher, EUCOMREG
Belgium*

Sector

Cybersecurity Network and Information Security

Engaged SDOs, WGs and TCs



CEN-CENELEC JTC13 Cybersecurity and data protection WG8 Special Working Group RED Standardisation Request
ETSI Cyber

Role

Expert member

Addressed EU standardisation priorities and gaps

Currently, there is no clear solution for evaluating the cybersecurity level of compliance with the RED Art. 3.3 d, e, f of radio equipment connected to the network.

My fellowship addresses the start of the work for a more comprehensive harmonised set of methods and tools to be used for testing and assessing the cybersecurity level of the equipment covered by the RED.

Besides the general accessibility of usable protocols based on the harmonised standards for the European SME community, I also want to contribute to the clarification of the test methods applicable in conjunction with the harmonised European standards. This is currently an area of some debate with the experts engaged in discussions around the scope and limitations of the RED and its Delegated Act.

Concerned ICT Standards and contribution to the related landscape

I am active in CEN-CENELEC JTC13 WG8. The proposed standards in Working Group 8 are prEN 18031-1, -2, -3 for 3.3. d, e, f correspondingly.

Impact (on European SMEs, related projects or in society)

Impact on SMEs

I am contributing to a work item in ETSI TC CYBER, and if possible, in JTC13 WG8, contributing to the production of usable methods of testing for cybersecurity compliance with RED Art. 3.3 d, e, f, and in general of cybersecurity evaluation protocols for use by the industry at large and SMEs. It is important (probably even more so for SMEs) that these protocols are based on published harmonised EN standards, so that they can be used by the radio communications equipment manufacturers and all other stakeholders to evaluate their equipment for the purpose of legal compliance to the cybersecurity requirements and therefore ultimately to improve their response to threats.

Impact on Society

While the society at large is not aware of the work done in this or most fields of expertise, the overall objective is to improve the way end-users communicate via their internet connected

devices. The improvements are manifold and generally they lead to the decrease in successful attacks leading to an increase in the level of trust in internet communications.

Has your project directly involved or led to a specific recommendation or proposal for developing new or revised standards?

Yes, the Working Group 8 of CEN-CENELEC/JTC 13 aims at producing CEN-CENELEC standard prEN 18031, which is currently being drafted. My participation as a member of this group to the effort of producing the standard, contributes to the work of drafting the 3 harmonised standards.

Have the standardisation activities in your project led to specific deliverables?

Not yet.

What future efforts or activities are still necessary for your area of application?

This is only the first step in a long process. While this effort might orient us in the correct direction, a lot of activities will need to be managed and supported with up-to-date standards and protocols for obtaining the outcome ensuring an acceptable level of risk. Here are some activities that are probably not on the map yet, including setting up:

- ▶ An authority that is responsible for the collection and dissemination of the solutions to vulnerabilities, or a cybersecurity entity that supervises the implementation of solutions to vulnerabilities in the EU cybersecurity landscape,
- ▶ A European standardisation committee or work group whose task is to keep evolving the standards to respond to the rapid change of different factors in the cybersecurity ecosystem.

These entities would probably be responsible for the protocols in the scope of the RED Art. 3.3 requirements for cybersecurity related issues.

Online references related to the fellowship work

 https://standards.cencenelec.eu/dyn/www/f?p=205:7:0:::FSP_ORG_ID:2307986&cs=1BFE244DDA2A68D1B5C93795034A8DD05

Integration of drivers (cybersecurity, privacy) and enablers (digital twins and IoT) in data spaces



Antonio Kung

CEO, Trialog

France

Sector

Data Economy

Engaged SDOs, WGs and TCs



ISO/IEC JTC1 SC27 Information security, cybersecurity and privacy protection

ISO/IEC JTC1 SC7 Software and systems engineering

ISO/IEC JTC1 SC38 Cloud computing and distributed platforms

ISO/IEC JTC1 SC41 Internet of things and digital twin

ISO/IEC JTC1/SC42 Artificial intelligence

ISO/IEC JTC1/SC32 Data management and interchange

Role

Convenor of ISO/IEC JTC1/SC41, AG25 and AG31

Addressed EU standardisation priorities and gaps

This fellowship focuses on two axes; data spaces and transversal aspects in data spaces. Both have dedicated gaps, priorities and challenges.

In data spaces, there is a lack of standards concerning data spaces focusing on architecture and interoperability aspects. Therefore, with this fellowship my priority is to focus on these aspects, as these form a barrier for industry growth, in particular for SMEs and support of current research and innovation projects. The challenge is the complexity of data spaces.

In the transversal aspects in data spaces, there is a lack of guidance on the integration of security and privacy, and it is crucial to develop this further as it is a barrier for compliance with regulation (e.g. CRA, AI act). The challenge is the assurance of complex systems.

Concerned ICT Standards and contribution to the related landscape

With this fellowship, I focus on the following standardisation areas:

On data space architecture, I work on:

- ▶ Contribution on data space concepts (ISO/IEC 20151)
- ▶ Contribution on architecture on the integration of IoT and digital twins in data spaces (ISO/IEC PWI JTC1-SC41-17)
- ▶ Contribution on Propose a digital twin reference architecture supporting data spaces (ISO/IEC 30188, ISO/IEC PWI JTC1-SC41-17)

On data space interoperability, I work on:

- ▶ Contribution on extensions to cover specific aspect of data spaces, e.g. data provenance (ISO/IEC 21823-1)
- ▶ Contribution on new standard on policy and behavioural interoperability (ISO/IEC 21823-5)
- ▶ Contribution to support usage enforcement in data spaces at interoperability level (PWI)

JTC1 SC41 17 and ISO/IEC 20151)

On transversal aspects in data space, I work on:

- Contributions to support cybersecurity assurance of data spaces (ISO/IEC 27115)
- Contributions on the impact of security and privacy of AI in data spaces (ISO/IEC 27090, ISO/IEC 27091)
- Contributions to support the impact of security and privacy of IoT and digital twins in data spaces (ISO/IEC 27568)

Impact (on European SMEs, related projects or in society)

Impact on SMEs

The proposed standards on architecture and interoperability will enable SMEs to provide technology solutions. These standards will provide a stable business environment where SMEs can provide specific building blocks and know-how.

Impact on Society

The related standards will directly impact European industry, innovation and infrastructure enhancing the interoperability of data spaces. Indirectly, these standards being applied in varied IoT solutions, support the deployment of digital twin technologies and data spaces, e-health and digital well-being services, as well as affordable and clear smart energy.

Has your project directly involved or led to a specific recommendation or proposal for developing new or revised standards?

Yes, I contribute to the following nine new standards:

- Contribution on data space concepts (ISO/IEC 20151)
- Contribution on architecture on the integration of IoT and digital twins in data spaces (ISO/IEC PWI JTC1-SC41-17)
- Contribution on Propose a digital twin reference architecture supporting data spaces (ISO/IEC 30188, ISO/IEC PWI JTC1-SC41-17)
- Extensions to cover specific aspect of data spaces, e.g. data provenance (ISO/IEC 21823-1)
- New standard on policy and behavioural interoperability (ISO/IEC 21823-5)
- Data spaces at interoperability level (PWI JTC1 SC41 17 and ISO/IEC 20151)
- Cybersecurity assurance of data spaces (ISO/IEC 27115)
- Security and privacy of AI in data spaces (ISO/IEC 27090, ISO/IEC 27091)
- Security and privacy of IoT and digital twins in data spaces (ISO/IEC 27568)

Have the standardisation activities in your project led to specific deliverables?

Yes, I have contributed to the four new standardisation projects, including: SC41 PWI16, SC41 PWI17, 21823-5, 27564.

What future efforts or activities are still necessary for your area of application?

The engaged standard development is not completed (as a standard creation process can take up to 3 to 4 years). Furthermore, there is a need for a set of standards to address the integration of drivers (cybersecurity, privacy) and enablers (digital twins and IoT) in data spaces.

Online references related to the fellowship work

📄 Privacy standards: https://ipen.trialog.com/wiki/Wiki_for_Privacy_Standards_and_Privacy_Projects

📄 SC41 https://www.iec.ch/dyn/www/f?p=103:7:13245000638506:::FSP_ORG_ID,FSP_LANG_ID:20486,25

📄 SC27 <https://www.iso.org/committee/45306.html>

📄 SC38 <https://www.iso.org/committee/601355.html>

📄 SC42 <https://www.iso.org/committee/6794475.html>

2. Key Enablers & Security

The background is a complex digital-themed collage. It features a dark blue base with glowing green circuit-like lines at the bottom. Overlaid are several concentric blue arcs on the left side. A prominent graphic on the right shows a fingerprint being scanned, with the ridges represented by white dots. Faint binary code (0s and 1s) is scattered throughout the upper right area.

eID Wallet for the European citizen under the new eIDAS2



Raul Sanchez-Reillo

*Associate Professor, Universidad Carlos III de Madrid
Spain*

Sector

E-Identification and Trust Services

Engaged SDOs, WGs and TCs



CEN/TC 224 Machine-readable cards, related device interfaces and operations /WG 20 Ad Hoc Group on European Digital Identity Wallets
ISO/IEC JTC1/SC17 Cards and security devices for personal identification AG3 Digital wallets

Role

Convenor of ISO/IEC JTC1/SC17

Co-convenor of CEN/TC 224/WG 20

Addressed EU standardisation priorities and gaps

This fellowship is based on the decision from the European Commission to request the revision of the eIDAS regulation, targeting what is commonly known as eIDAS2. Many different technologies, protocols, procedures, etc. could be applicable and, at the same time, it might not be possible to define a single solution for all Member States.

After the publication of the ARF by the EU Expert Group, the work in this area has exceeded what it was initially proposed.

Several SDOs have started to work, preparing the path for the upcoming standardisation mandate, both in CEN, CEN/CENELEC and ETSI/ESI. Obviously, this is not an only European need, and has raised the interest of other international SDOs, such as ISO and ISO/IEC.

ISO/IEC JTC1 SC17, has acknowledged the need to work on this at international level, creating the Advisory Group (AG3) on Digital Wallets, to collect all available inputs, and detect the standardisation items to be started at international level.

I'm currently co-convenor of CEN/TC 224/WG 20, and the convenor of ISO/IEC JTC1/SC17 AG3. With this fellowship, I continue the work in both groups.

Some important gaps and challenges are:

- ▶ Will the wallet implement only the Primary Identity, or also Secondary Identities?
- ▶ What are the implications of the ARF published by the EU Expert Group, to the different implementations of an eID Wallet?
- ▶ Which are the requirements for a wallet if it is implemented using SSCD-based technology?
- ▶ Which are the requirements for a wallet if it is implemented using a citizen-owned mobile device?
- ▶ How to restrict access to non-authorized identity information?
- ▶ How to allow the creation of new attributes and/or secondary identities for a specific application?
- ▶ How to make all implementations interoperable?

Concerned ICT Standards and contribution to the related landscape

When a sudden interest is created, there is a risk that both technological and standardisation works will be developed in different lines, contradicting one to each other. Therefore, it is a must to coordinate all those efforts, trying to reach a common ground and reduce the workload and the risk of creating a non-usable product. Hence, my fellowship focuses on coordinating those efforts, both at the European and international levels.

Also, as there will be a common point of discussion, converging all relevant data, participation of companies and Administrations could be increased, reducing them the hard work of trying to discover which piece of work is relevant for their work, in the definition/implementation/use of Digital Identity Wallets.

This activity will not only add value to CEN/TC 224/WG 20 and ISO/IEC JTC1/SC17, but also will provide valuable information to other SDOs, such as ETSI/ESI. And of course, this will be in line to the needs for the implementation of eIDAS2.

The work proposed here will help to improve the visibility of WG20 and to promote further work in ISO/IEC JTC1/SC17, as well as the consideration of its work into practical products and services.

Impact (on European SMEs, related projects or in society)

Impact on SMEs

When the European Identity Wallet will be defined, all service providers will have to adapt their services to use that wallet. Most service providers are either SMEs or use solutions developed by SMEs, so the definition of that identity wallet will have a major impact on the activities of those SMEs, increasing their workload, and therefore, their benefits.

Impact on Society

European citizens need an interoperable secure means to authenticate themselves all over Europe, when carrying out electronic transactions. This interoperability shall be achieved by providing the required technology, and designing the relevant processes.

With those elements defined and deployed, citizens will be able to access a huge variety of services all around the European Union, in a trusted and secured manner.

Has your project directly involved or led to a specific recommendation or proposal for developing new or revised standards?

Yes. From all the works being done, one standard is currently under development in CEN TC224 WG20. This standard is a Technical Specification identified as WI=00224276 "Guidelines for the onboarding of user personal identification data within European Digital Identity Wallets". It is expected to be published within 2024.

Have the standardisation activities in your project led to specific deliverables?

In CEN TC224 WG20, a new Working Draft of the Technical Specification titled "Guidelines for the onboarding of user personal identification data within European Digital Identity" (Work Item number: 00224276) has been generated, and we're in the process of finalising the resolution of the more than 400 comments that have been received.

A new Working Draft is expected by the end of this action.

Regarding ISO/IEC JTC1/SC17 AG3, the 2024 Activity Report is being drafted, expecting its final version by the end of summer 2024.

What future efforts or activities are still necessary for your area of application?

Further versions of “Guidelines for the onboarding of user personal identification data within European Digital Identity Wallets” shall be developed, to reach the final ballot process and its publication as a Technical Specification.

Also, new work items are needed, regarding the way the user gives access to the information on the wallet, as well as in the maintenance of the information of the wallet (i.e., deleting, adding, modifying attributes and credentials, once the wallet has already been instantiated and the PID has been on-boarded).

In ISO/IEC JTC1/SC17 AG3 it is expected that, from the AG3 Report being developed, new standardisation projects will be initiated.

Online references related to the fellowship work

 <https://www.iso.org/committee/45144.html>

Cybersecurity standards for AI systems in response to the EC standardisation request



Francisco Medeiros-Filho

Independent expert, FM Tech Consult BV
Belgium

Sector

Artificial Intelligence

Engaged SDOs, WGs and TCs



CEN/CENELEC JTC21 WG1 Strategic Advisory Group
CEN/CENELEC JTC21 WG5 Cybersecurity for AI Systems

Role

Co-convenor of CEN/CENELEC JTC21 WG1 Strategic Advisory Group

Co-convenor of CEN/CENELEC JTC21 WG5 Cybersecurity for AI Systems

Addressed EU standardisation priorities and gaps

My fellowship work addresses the following gaps:

1. Although cybersecurity standardisation for IT and information systems is well advanced in the context of ISO/IEC JTC1/SC27, currently there are no specific standards applicable to cybersecurity for AI systems.
2. CEN/CENELEC JTC21 is under pressure to re-use as much as possible, ISO/IEC JTC1/SC27 work and adopt SC27 deliverables without modification. However, as of today, there are no specific cybersecurity standards applicable to AI systems. Work has just begun within SC27 WG4 on ISO/IEC 27090 "Guidance for addressing security threats and failures in artificial intelligence systems".

Recital 121 of the AI Act text adopted by the European Parliament on 13 March 2024 states that *"standardisation should play a key role to provide technical solutions to providers to ensure compliance with this Regulation, in line with the state of the art, to promote innovation as well as competitiveness and growth in the single market. Compliance with harmonised standards, which are normally expected to reflect the state-of-the-art, should be a means for providers to demonstrate conformity with the requirements of this Regulation"*.

The AI Act is expected to enter into force in May/June 2024. Therefore, the standardisation work carried out by CEN/CENELEC JTC21 will have a direct impact on the industry, especially in the field of cybersecurity for AI systems. The relevance of the proposed work is due to the pressing need to have cybersecurity standards for AI systems available as soon as possible to demonstrate compliance with the legal obligations imposed by the AI Act, as described below:

Article 15.1 of the AI Act: *high-risk AI systems shall be designed and developed in such a way that they achieve an appropriate level of accuracy, robustness, and cybersecurity, and that they perform consistently in those respects throughout their lifecycle.*

Article 15.5 of the AI Act: *high-risk AI systems shall be resilient against attempts by unauthorised third parties to alter their use, outputs or performance by exploiting system vulnerabilities. The technical solutions aiming to ensure the cybersecurity of high-risk AI systems shall be appropriate to the relevant circumstances and the risks. The technical solutions to address AI specific vulnerabilities shall include, where appropriate, measures to prevent, detect, respond to, resolve and control for attacks trying to manipulate the training data set (data poisoning), or pre-trained components used in training (model poisoning),*

inputs designed to cause the AI model to make a mistake (adversarial examples or model evasion), confidentiality attacks or model flaws.

Concerned ICT Standards and contribution to the related landscape

Standards and technical reports being drafted by ISO/IEC JTC1/SC27 and CEN/CENELEC JTC13 will be used as input. However, there is a lack of specific standards covering the field of cybersecurity for AI systems. Hence, the importance of the new CEN/CENELEC JTC21 WG5 (Cybersecurity for AI Systems) work to develop the necessary deliverables in the context of the EC standardisation request (SReq#8) on Cybersecurity for AI Systems.

ISO/IEC JTC1/ SC27 WG4 has just initiated work on a Technical Report ISO/IEC 27090. This deliverable is intended to provide guidance to organisations concerning AI-specific vulnerabilities. Therefore, 27090 has the potential to become relevant. This TR just provides guidance to organisations; hence it does not respond to the EC standardisation request. The actual drafting of cybersecurity standards for AI systems will be done by JTC21 WG5 over the next 12 months (WG5 kick-off meeting on 25 January 2024).

Impact (on European SMEs, related projects or in society)

Impact on SMEs

The AI Act highlights the importance of EU harmonised standards and conformity assessment (based on such harmonised standards) for the industrial stakeholders (providers) and for users of AI systems. Harmonised cybersecurity standards for AI systems need to be developed and adopted, as a matter of urgency, for the benefit of the European industry, including SMEs and startups, as well as users and consumers. In this context, it is necessary to demonstrate the trustworthiness of AI systems. Cybersecurity is just one of the aspects of trustworthiness.

Impact on Society

It is well known that the widespread use of AI systems is bound to have a significant impact on society. This subject has been debated at length by different academic, industrial, and governmental organisations. Cybersecurity for AI systems, although being just one of the aspects, is essential to demonstrate the trustworthiness of AI systems, hence providing assurance to users and consumers (societal impact).

Has your project directly involved or led to a specific recommendation or proposal for developing new or revised standards?

Yes, I am advocating two approaches to be followed by JTC21 WG5:

1. Initiate “parallel development” between ISO/IEC SC27 and CEN/CENELEC JTC21 of the technical report ISO/IEC 27090.
2. Initiate the drafting of a ‘homegrown’ European Standard (EN) addressing AI-specific vulnerabilities in response to the EC standardisation request. Proposed title: Cybersecurity specifications for AI Systems.

Have the standardisation activities in your project led to specific deliverables?

Yes. The gap analysis report produced by the JTC21 WG1 Task Group on Cybersecurity for AI Systems. This report is now being utilised as input to the two approaches mentioned above.

What future efforts or activities are still necessary for your area of application?

The development of the ‘homegrown’ European standard within JTC21 on cybersecurity for AI systems and the adoption/modified adoption of ISO/IEC 27090 soon.

Online references related to the fellowship work

 www.cencenelec.eu/areas-of-work/cen-cenelec-topics/artificial-intelligence/

Philosophical Contributions on TS6254 - Explainability



Carlos Zednik

*Assistant Professor for philosophy of artificial intelligence,
Eindhoven University of Technology
Netherlands*

Sector

Artificial Intelligence

Engaged SDOs, WGs and TCs



| ISO/IEC SC 42 Artificial Intelligence WG 3 – Trustworthiness

Role

Expert member

Addressed EU standardisation priorities and gaps

Although AI system explainability is generally deemed important, there is no consensus on what ‘explainability’ means or how methods from explainable AI can and should be used to achieve it. Explainability is critical for ensuring trustworthiness of state-of-the-art AI. Standardising explainability will build consensus on best practices methods that allow developers to build more high-performing systems, provide enhanced end-user experience, and facilitate oversight.

The reason that there is no consensus definition of ‘explainability’ is that different stakeholders disagree on the meaning of the term. Moreover, there is disagreement on the way in which this concept relates to other concepts such as ‘interpretability’ and ‘transparency’. My current standardisation work, funded by this fellowship, aims to resolve these disagreements.

Concerned ICT Standards and contribution to the related landscape

My standardisation efforts during this fellowship period focused on the ISO/IEC TS 6254 - Explainability project. TS 6254 is scheduled to be the first global standard for AI explainability. Within this project, I was a member of a multi-SDO task force whose aim was to resolve the “terminology debates” that surround the meaning of ‘explainability’ and related concepts. This fellowship compensated for the working hours I dedicated to this effort and covered my travel to relevant committee meetings such as the plenary meeting of the ISO/IEC JTC1 SC42 in Vienna, Austria in September 2023.

Impact (on European SMEs, related projects or in society)

Impact on SMEs

AI explainability affects all stakeholders in the AI system life cycle. These include AI developers, deployers, and users, many of which are SMEs. Moreover, explainability is critical for AI trustworthiness, which impacts end-users and societal regulatory bodies in Europe and beyond. By articulating conditions and best practices of explainability, therefore, my contributions help SMEs and other stakeholders develop trustworthy AI.

Impact on Society

Explainability is a critical feature of trustworthiness in AI, but the impact is hard to measure. The impact will be significant and positive if future AI systems are more transparent, and for this reason more trustworthy.

Has your project directly involved or led to a specific recommendation or proposal for developing new or revised standards?

I do not know.

Have the standardisation activities in your project led to specific deliverables?

Yes, I have drafted technical specifications.

What future efforts or activities are still necessary for your area of application?

TS 6254 is almost complete and will be published soon.

Online references related to the fellowship work

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

DT-COOP: Standardising Digital Twins Cooperation



Mauro Dragoni

*Principal Investigator, AI4People
Italy*

Sector

Artificial Intelligence

Engaged SDOs, WGs and TCs



ETSI SmartM2M (Machine-To-Machine) Communication Working Group
ETSI OCG (Operational Coordination Group) on Artificial Intelligence OneM2M

Role

Expert member

Addressed EU standardisation priorities and gaps

In this fellowship, I work on the analysis of the Digital Twins (DT) landscape with a focus on the urban domain. We focused on two priority gaps that, once solved, may enable the modelling of complex DT through the exclusive use of the SAREF suite to enhance the interoperable communication between entities composing a DT; and to enable the modelling of time series to represent how a DT evolves through time.

It has also been discussed that the existing standards, overall, lack the capability to effectively generalise the representation of DTs and, most importantly, to model the interactions among the entities participating in complex DTs. The urban domain serves as a prominent setting where these deficiencies become apparent, given the necessity to develop digital counterparts of various entities that must seamlessly communicate with each other. This communication aspect plays a pivotal role in shaping the DT within an urban domain as it acts as a catalyst for simulating interactions among diverse entity types. For instance, it enables the exposure of specific services that allow each entity to access information from others.

The establishment and administration of a DT involves the necessity of depicting the evolution of a Digital Twin Representation over time. Given this requirement, there is a need to define a methodology for modelling time series, as there are currently no established standards or semantic representations in SAREF for this purpose. Time series data assumes a pivotal role in validating the accuracy of a DT, serving as the ultimate reference for authenticity. Moreover, having a standardised approach to handling time series data offers the added benefit of serving as a data source for AI-based systems. This facilitates the aggregation and presentation of data in a way that enhances the value proposition of AI-based solutions through intelligent insights.

Concerned ICT Standards and contribution to the related landscape

This project has several key goals. It aims to design and present a clear blueprint for how Digital Twins (DTs) can be designed and structured, and how they work and communicate with respect to both physical and digital entities.

This project relies on the insights and information coming from use cases present in DTR/SmartM2M-103844 and established DT functionalities and requirements presented in DTS/SmartM2M-103845.

Moreover, it defines how DTs can be designed through the presentation of a reference blueprint architecture with a specific focus on communication, discoverability, and interoperability aspects. It also sets guidelines for DT adoption and applicability analysing how they can be deployed and monitored over time.

Furthermore, this document will specify the definition and communication aspects of DTs, defining their fundamental characteristics and the requirements for their communications and interoperability, through edge-cloud continuum deployments and with respect to their Physical and Digital Interfaces.

Impact (on European SMEs, related projects or in society)

Impact on SMEs

The expected impact is in terms of the development of the digital market and the engagement of stakeholders from the different business domains.

This proposal will amplify the SAREF impact on the standard ontology's general usability.

It would be possible to empower the EU know-how and leadership in this sector, especially in the ontology-AI-Digital Twins integration.

SAREF is well recognized as the reference approach in the industrial sector, being developed in a compatible way with W3C's semantic web approach, but at the same time being much closer to the different business sector solutions.

The market will be provided with a powerful tool to enable semantic interoperability and to complete the EU digitalization towards IoT.

Furthermore, it will support the diffusion of SAREF in emerging extra-European markets with potential benefits for the EU technology leadership in this sector and potential positive effects of the adoption of EU technology.

Impact on Society

Society will benefit by the project outcomes in the middle-term. The creation of a standard to design and develop Digital Twins will ease the creation of simulated environments that will optimise the building and the maintenance operations within the industrial sectors.

Once this aspect will be consolidated and will be part of the best-practices to build such systems, the increased quality of the outcomes of the industrial sector will contribute to increase the quality of life of citizens.

Has your project directly involved or led to a specific recommendation or proposal for developing new or revised standards?

All activities are performed in tandem with the ongoing work related to the ETSI STF641 and STF628 aiming to develop standards related to the definition and adoption of interoperable Digital Twins architectures. Currently, a standard covering this domain does not exist.

Have the standardisation activities in your project led to specific deliverables?

A final deliverable will be published in the context of ETSI activities, and it will be included in its documents collection of standards.

What future efforts or activities are still necessary for your area of application?

In this project we focused on the standardisation of Digital Twin design at a general level.

Future efforts are necessary to integrate and adapt the outcome of this project to a selection of relevant and sensitive vertical domains. The aim of this effort is two-fold; Firstly, it would be a testbed to verify the quality of the developed standard aiming to collect qualitative feedback about the project's outcomes. Secondly, the integration of this model into real-world vertical initiatives will advance the adoption of such a standard into industrial best-practices and, consequently, to be part of the digital market.

Online references related to the fellowship work

 <https://portal.etsi.org/TB-SiteMap/SmartM2M/SmartM2M-ToR>

Large scale QKD and Quantum Networks best practices



Homer Papadopoulos

Project Leader, NCSR Demokritos/ Co-founder of Syndesis Ltd Greece

Sector

Quantum Technologies

Engaged SDOs, WGs and TCs



CEN/CENELEC JTC 22, QuIC Standardisation Working Group

Role

Member

Addressed EU standardisation priorities and gaps

The development of ICT standards for QT is crucial for establishing harmonised approaches and interoperability within the EU, thus ensuring the successful deployment of large-scale quantum networks. This effort is particularly relevant given the threat posed by quantum computing to current cryptographic systems. The potential of quantum computers to break existing encryption, including RSA cryptographic codes, underscores the urgency of developing quantum-safe encryption methods, such as QKD systems, to protect critical infrastructure and sensitive data.

The European Union, through initiatives like EuroQCI, has recognized the necessity of safeguarding critical infrastructures against emerging cyber threats, emphasising the need for standardisation in implementing quantum networks. My fellowship aims to lay the groundwork for standardisation by creating a comprehensive technical report that outlines the needs, trends, best practices, and the current state of QT initiatives like EuroQCI. It will specifically focus on the standardisation of QKD, a key technology for secure quantum communication.

Furthermore, national efforts (Germany, Netherlands, Italy, Austria, and France have allocated substantial funds for quantum research) underscore the importance of a coordinated European approach to QT standardisation, as represented by the establishment of CEN-CENELEC JTC22.

The targeted ICT standards development activity addresses the dual challenges of securing communications in the quantum era and fostering the growth and interoperability of QT across Europe. By aligning standardisation efforts with national initiatives and focusing on critical technologies like QKD, this activity seeks to protect Europe's digital infrastructure and promote the continent's leadership in the quantum revolution.

Concerned ICT Standards and contribution to the related landscape

With this fellowship, I contributed to developing standards for QKD systems and Quantum Networks, vital for protecting Europe's digital infrastructure against new cybersecurity threats.

The project contributes to CEN-CENELEC JTC22 WG4's efforts in drafting technical standards for quantum technologies. This collaboration is key to building a secure, interoperable, and standardised quantum communication infrastructure across Europe, in line with the EuroQCI initiative's goals.

The work focuses on several ICT standards:

- ▶ Standards for QKD protocols and technologies, ensuring secure quantum communication channels.
- ▶ Interoperability standards for Quantum Communication Infrastructures (QCIs), enabling seamless integration across borders and platforms.
- ▶ Best practices and technical specifications for quantum networks deployment, including architecture designs, security protocols, and procedures.

The project emerged from the urgent need to standardise Quantum Communication and Cryptography in Europe due to the vulnerabilities posed by quantum computing advancements. By drafting a technical report on the standardisation requirements for large-scale QKD and Quantum Networks, we aim to provide a foundation for future quantum communication infrastructures based on standardised protocols and best practices.

The development of ICT standards in Quantum Technologies is crucial for Europe's strategic interests, addressing the challenge quantum computing poses to cryptographic systems and ensuring long-term security for critical infrastructures and sensitive information. Our targeted activity supports the EuroQCI initiative's goal to deploy a secure quantum communication infrastructure, facilitating quantum technologies' integration and promoting Europe's digital sovereignty.

Impact (on European SMEs, related projects or in society)

Impact on SMEs

For European SMEs, this work opens new opportunities in the quantum technology market by providing clear, standardised pathways for the adoption and implementation of quantum communication technologies. This enables SMEs to compete more effectively in the global technology landscape, fostering economic growth and innovation within the European Union.

Impact on Society

For European societies, the implications are profound. Secure quantum communication networks protect sensitive information and critical infrastructures from quantum computing threats, enhancing the overall security and resilience of European digital infrastructure. This contributes to a safer, more secure Europe, where citizens can trust the protection of their data and the stability of critical services.

Has your project directly involved or led to a specific recommendation or proposal for developing new or revised standards?

Yes, I am actively contributing to the development of new and revised standards in the Quantum Communication Technologies sector, specifically focusing on Quantum Key Distribution systems and Quantum Networks. Through the collaboration with CEN-CENELEC JTC22 WG4, I am directly involved in shaping the technical standards and reports that will underpin the next generation of quantum communication infrastructure across Europe.

Our efforts target the establishment and refinement of standards in several key areas:

- ▶ Protocols and technologies for QKD, ensuring robust quantum communication channels.
- ▶ Interoperability standards for Quantum Communication Infrastructures (QCIs), to support seamless integration across diverse technological platforms and national borders.
- ▶ Deployment of best practices and technical specifications for quantum networks, covering architecture, security protocols, and operational procedures.

Have the standardisation activities in your project led to specific deliverables?

The work is in progress, and we expect that the outlined activities will contribute to the development of the Technical Report: Best Practices for Quantum Networks within the framework of the WG4 Quantum Communication and QKD.

What future efforts or activities are still necessary for your area of application?

There is a need to continue supporting the work of JTC 22 WG4 to establish harmonised approaches and interoperability within the EU for deploying large-scale quantum networks. Efforts should align with initiatives like EuroQCI to safeguard critical infrastructures against cyber threats by promoting standardisation in quantum network implementation, ensuring consistency with broader EU strategies and priorities.

Online references related to the fellowship work

 <https://www.cencenelec.eu/areas-of-work/cen-cenelec-topics/quantum-technologies/>

Towards accurate, transparent, and explainable systems in AI and NLP, in support of the AI Act



Lauriane Aufrant

NLP lead scientist for Defense and security applications, Inria France

Sector

Artificial Intelligence

Engaged SDOs, WGs and TCs



ISO/IEC/JTC 1/SC 42 “Artificial intelligence” WG 1 “Foundational standards”

ISO/IEC JTC1/ SC42 WG 3 “Trustworthiness”

ISO/IEC JTC1/ SC42WG 5 “Computational approaches and computational characteristics of Artificial Intelligence systems”

ISO/IEC JTC1/ SC42JWG 5 “Natural language processing”

CEN/CLC/JTC 21 “Artificial intelligence” (including WG 1 “Strategic Advisory Group”, WG 3 “Engineering aspects”)

AFNOR/CN IA “Artificial intelligence”

CEN/CLC/JTC 21 to ISO/TC 37 “Language and terminology”.

Role

Convenor for ISO/IEC JTC 1/SC 42 JWG 5 “Natural language processing”

Member in other groups

Addressed EU standardisation priorities and gaps

With this fellowship, my efforts are currently focused on answering the standardisation request that CEN-CENELEC JTC21 received from the European Commission in relation to the AI Act. As the target dates grow closer (most of the drafting needs to be done by mid-2024), the current pool of experts is insufficient to answer the diverse needs expressed in the request. I have thus initiated reinforced outreach efforts and onboarding sessions for new experts. It also appears that there remain many gaps and inconsistencies in the existing landscape of AI standardisation projects in JTC 21 (& ISO/IEC JTC 1/SC 42), which are now hindering the correct development of requirements expected by the EC (e.g. standard on bias for classification/regression systems, but not other AI systems; evaluation metrics for classification and for NLP but not for clustering for instance). On my initiative, JTC 21 created a Technical Coherence Forum that will investigate exactly that question. Overall, I am taking a more holistic view of the AI standardisation roadmap while pursuing in parallel my contributions to specific AI standards in SC 42 and JTC 21.

Concerned ICT Standards and contribution to the related landscape

In the framework of this fellowship, I am taking an active role in the incubation of several new standardisation projects (domain and operation conditions, bias-related requirements, data quality and governance, computer vision...) while contributing to the launch of others that are just starting (AI trustworthiness framework, statistical assessment of robustness ISO/IEC WD 24029-3, taxonomy of AI methods and capabilities ISO/IEC WD 42102, terminology of generative AI ISO/IEC 22989 AMD 1, evaluation of NLP systems ISO/IEC NP 23282...) and

finalising the drafting for some more advanced standards (explainability and interpretability ISO/IEC TS 6254, transparency ISO/IEC CD 12792, terminology of NLP tasks JT021002...).

Beyond technical contributions as an expert, my leadership responsibilities include being ISO/IEC JTC 1/SC 42 Convenor for JWG 5 “Natural language processing”, Editor for JT021002 on NLP tasks in CEN/CLC/JTC 21, JTC 21 Editor for NP 23282, head of the French delegation to CEN-CENELEC JTC 21, and liaison officer from JTC 21 to ISO/TC 37 “Language and terminology”.

Impact (on European SMEs, related projects or in society)

Impact on SMEs

There is growing concern regarding the impact of the upcoming AI Act on the activity of SMEs in that field. While it is feared that a large number of standards associated with the AI Act could create an excessive burden for SMEs to understand and implement the new requirements, on the other hand, if there remain gaps in the standards' coverage of the AI landscape, this will create huge challenges for SMEs whose products sit precisely in such areas (inability to comply). I have taken special care of these aspects when delineating scopes for new Natural Language Processing standards I have proposed as gap fillers.

In parallel, and beyond the considerations for the AI Act, I am also including in my work (in particular my NLP work) continuous considerations for interoperability aspects, which are key to enabling easier entry into the market for European SMEs.

Impact on Society

My work serves as support to the preservation of consumer rights, by enabling more transparency, comparability, and clarity on the actual performance of AI systems in the market. Its societal impact also encompasses ethical aspects of AI such as human agency, for which appropriate use of explainability methods is a key enabler. More generally, it benefits the society at large through its interplay with the upcoming AI Act that will impact daily lives in Europe.

Has your project directly involved or led to a specific recommendation or proposal for developing new or revised standards?

Yes, I contribute to the ongoing ballot for the launch of “AI trustworthiness framework” at CEN/CLC/JTC 21, Preliminary Work Item at ISO/IEC JTC 1/SC 42 on “domain and operation conditions”, ongoing Preliminary Work Item at JTC 21 on data and bias which will lead to two new standardisation projects (requirements for managing bias, data quality and governance), plans for a new preliminary work item on computer vision (in particular its evaluation metrics).

Have the standardisation activities in your project led to specific deliverables?


Yes, I have contributed to technical specifications and reports.

What future efforts or activities are still necessary for your area of application?

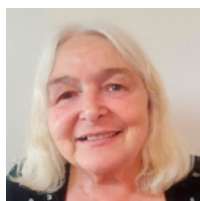
To date, many of the experts involved in the European standards in support of the AI Act are actually employees of non-EU companies, promoting non-EU views. This has a severe impact on the ability to consolidate an EU position on those topics, and raises questions on whether we will at all succeed in establishing requirements to implement the AI Act. Both communication and funding need to be increased to enable the involvement of more experts who are not tied to non-EU interests but are actually promoting the EU views.

Online references related to the fellowship work

 <https://www.iso.org/committee/6794475/x/catalogue/p/1/u/1/w/0/d/0>

 https://standards.cenelec.eu/dyn/www/f?p=205:22:0:::FSP_ORG_ID,FSP_LANG_ID:2916257,25&cs=1827B89DA69577BF3631EE2B6070F207D

Study of IEC System committee use cases and their relevance to JTC 1 standardisation



Kate Grant

*Independent Expert, Kate Grant consultant
England*

Sector

Internet Of Things

Engaged SDOs, WGs and TCs



IEC Systems Committee on Active Assisted Living
IEC Systems Committee on Smart Cities
IEC Systems Committee on Smart Manufacturing
IEC Systems Committee on Bio-digital Convergence
IEC Systems committee on Communications Technologies and Architectures
ISO/IEC JTC 1 - Information technology, and various SCs
IEC TC 100 Audio, video and multimedia systems and equipment

Role

Technical Area Manager (TAM) of IEC TC100 TA16 Active Assisted Living (AAL), wearable electronic devices and technologies, accessibility and user interfaces

Co-Convenor of IEC TC100 ahG 10 AGS strategic priorities and future topics and Use Cases and related studies.

Member of IEC TC100 WG12 Metaverse

Member of ISO/IEC JTC1 and various subgroups including

SC6 (Telecommunications and information exchange between systems),

SC24 (Computer Graphics, image processing and environmental data representation) SC41 (Internet of Things and Digital Twin), WG13 Trustworthiness)

JTC 1 AG2 JETI (Advisory Group on JTC 1 Emerging Technology and Innovation) and JTC 1 AG14 Systems Integration Facilitation (SIF)

Member of several IEC Systems Committees including

IEC SyC AAL(Active Assisted Living)

IEC SyC BDC (Bio-digital Convergence)

IEC SyC SM (Smart Manufacturing),

IEC SyC Comms (Communication Technologies and Architectures)

IEC SyC Smart Cities (Electrotechnical Aspects of Smart Cities)

SEG 15 Joint SEG with ISO -- Metaverse

Addressed EU standardisation priorities and gaps

The European Commission has identified Internet of Things (IoT) as a priority area and an essential building block of the Digital Single Market. The work of IEC JTC 1 SC41 (IoT and Digital Twin) is proving fundamental to the work of many IEC systems committees which address specific technology areas such as Smart Manufacturing, Smart Cities, Communications Technologies. It is important that clear use cases explain how IoT can be deployed in these scenarios and that identified requirements are reflected in appropriate standardisation.

Concerned ICT Standards and contribution to the related landscape

Identifying standardisation gaps and creating road maps is essential for ensuring technology development addresses key problem areas. JTC 1 produces Technology Trend Reports to look at facets of new technology requirements and application and currently a TTR on Metaverse is under development. Similarly, IEC TC100 has formed a new WG to progress Metaverse related standardisation and it is important that concepts, terminology etc. are shared between the two bodies and here the role of the Liaison Officer between JTC 1 and IEC TC100 is very important in supporting collaboration between the various active entities.

Impact (on European SMEs, related projects or in society)

Impact on SMEs

Elaboration of use cases for technology and emerging technology can help SMEs exploit their work in multiple application areas and help ensure that their products are interoperable and accessible.

Impact on Society

Where use cases are used to identify requirements (for example in Active Assisted Living) it is easier to develop standards that can improve the life of many by identifying specific requirements or technology that can make a difference from fall detection to telehealth monitoring of vital signs. IoT is a pervasive technology used across many industries and increasingly it is benefitting consumers by providing access to many systems and facilities from home. It is important that the current moves to online government, banking, shopping etc does not create a digital divide but includes all people.

Has your project directly involved or led to a specific recommendation or proposal for developing new or revised standards?

Not in this initial stage, but I am contributing to NB recommendations to TC100 and JTC 1 May 2024 plenaries and to the strategic directions for standardisation being developed in both IEC TC100 and JTC 1 where I am a liaison officer between the two committees.

Have the standardisation activities in your project led to specific deliverables?

The liaison reports or information exchange between different committees, e.g. JTC 1 and IEC TC100, SC41 and SyC Smart Cities, SC41 and SyC-AAL etc., will all influence the content of forthcoming standards and technical reports. The role of liaison officers in highlighting specific documents to experts ensures that they are considered, and comments provided as necessary.

What future efforts or activities are still necessary for your area of application?

I still see several axes where more effort should be invested. Notably, elaboration of use cases to support new work item proposals and set the context for the work improves the appreciation of the relevance of items of standards work, particularly in fields of emerging technology. Encouraging experts to follow a consistent approach to use cases (such as that being adopted in many IEC committees) allows common requirements and constraints for information exchange between actors to be highlighted and may lead to more collaboration across sectors when addressing similar problems.

Incorporating use cases in NWIPs allows a better understanding of the scope and benefit of the work and allows for recruitment of more technology experts to deliver the final standard. If the use case is only a clause heading in a yet to be developed annex it does not help justify the development of the standard and may lead to ballot abstentions. A two-stage process of a short high level use case covering general application in the NWIP can then be expanded into a more detailed use case as the text is developed and may also concentrate on some very

specific scenarios and requirements. SyC Smart Cities is successfully adopting this approach and has 2 parts to many of their use case SRDs.

Online references related to the fellowship work

 IEC Academy webinar series <https://www.iec.ch/academy/webinars>

- ▶ Project management methodology for developing IEC International Standards
- ▶ Working together: Systems and Technical Committees
- ▶ Standards Collaboration on Data Use in Smart Cities (ISO/IEC JTC 1 workshop)

Multi-Criteria Intelligent Resource Allocation for Sustainable Poly-CSP Environments



Muslim Elkotob

*Principal Solutions Architect and Standardisation Expert,
Vodafone
Germany*

Sector

5G and beyond, 6G

Engaged SDOs, WGs and TCs



ETSI TC INT Core Network and Interoperability Testing (INT)
AFI Autonomic Future Internet
ITU-T ITU-T Focus Group on Testbeds Federations for IMT-2020 and beyond (FG-TBFxG) SG11
IEEE INGR SysOpt (System Optimization) and AI/ML

Role

Chairman of ETSI AFI

Vice chairman of ETSI TC INT and of ITU-T FG-TBFxG

Addressed EU standardisation priorities and gaps

With this fellowship I address the main gap, which is the need in the industry (especially by Operators, but also (software) vendors and smaller players) of solid foundation for standards to be energy efficiency and other green use cases based on optimization, automation, an enhanced reusable (for Standards) workflow backed by software architectural templates and frame we established and recognized in the SDO community and ecosystems (e.g. the TM Forum Open Digital Architecture (ODA))

Another important addressed gap is the lack of a basis for CSPs (Communication Service Providers) to be highly interoperable and avoid high maintenance costs and the lack of adaptability when it comes to static resource switching between multiple stakeholders. This is despite the latter often being steered using a small number of parameters. Thus, with automation and AI-based resource control, this gap shall be closed.

With this work, I focus on enabling collaborative ecosystems and models among ICT stakeholders that allow energy saving and a positive environmental and societal footprint. Bridging use case workflow and ecosystem design in a way that allows data-driven collaboration and performance increments.

With this priority in mind, the key challenge is building workflows for the target use cases in such a way to parametrize energy savings especially their data-driven ecosystem aspects and data in a uniform way to build a common reference model is a challenge. Moreover, Designing the functionality to be granular enough to make a notable difference in performance and align to a standard reference TMF Forum ODA model adds to this challenge.

Aligning CSPs/Operators with different OSS and BSS Architectures to work in a harmonious collaborative manner in the target use cases and achieve with AI and Automation for increased efficiency is a hurdle that needs to be overcome.

Concerned ICT Standards and contribution to the related landscape

There are several ways in which my fellowship project adds value to targeted SDOs and the ICT Standards landscape:

Firstly, The TM Forum will gain large value with me Championing the Catalyst project The Catalyst C23.0.472: AI-powered cooperation for efficient networks driving forward this work and the underlying approach, also allows this funded project to be in a Win-Win relationship with TM Forum, via aligning the Software Modules in the energy saving AI-based use cases and workflows to the TM Forum reference software architecture ODA (Open Digital Architecture).

Secondly, a key beneficiary SDO of this project work is ETSI, especially when it comes to Energy Saving Use Cases and their standardisation with Data Sharing and Telco Data Spaces. I am leading part of the work done in the state of the art in this respect within ETSI INT and ETSI AFI.

Thirdly, it achieved a standards-backed specification for use-case building in Multi-Operator Scenarios. This specification will contain a blueprint model with reference points, a high-level workflow to capture the dynamics of instantiation of AI-based algorithms for efficiency and high onto the ecosystem and underlying use-case, and ways to interconnect and improve inter-stakeholder interactions, which will create a whole array of new opportunities.

Finally, an ETSI based standard ETSI TR 103763 which is matured, widely applicable across ecosystems and stakeholders and specifying the E2E Test Requirements and Methodology/ Approach for Federated Testbeds as well as applying those principles to an instantiated standards-backed Use Case will constitute a significant step on the ICT landscape for Federated Testbeds

Impact (on European SMEs, related projects or in society) Impact on Society

The work done in this funded project has societal impacts such as, improving the business ecosystem and its evolution via collaborative models where stakeholders have win-win approaches for energy saving and collective benefit. It also fosters an inclusive mindset by opening the floor for smaller players, SMEs, and new entrants into the ecosystem to collaborate with the larger players. Finally, it follows a low-carbon and environmentally friendly approach as a business objective and key KPI in the developed scenarios.

Has your project directly involved or led to a specific recommendation or proposal for developing new or revised standards?

Yes, I have contributed to the following standardisation item: BFG-O-077-R1 Technical Report D1.1: Use cases for federated testbeds and business scenarios ITU-T Focus Group on Testbeds Federations (14-16 February 2024).

Have the standardisation activities in your project led to specific deliverables?

Yes, I have contributed to drafting a technical report on a development of a new standard.

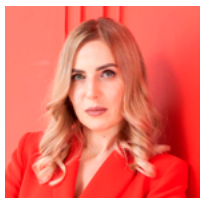
What future efforts or activities are still necessary for your area of application?

I have achieved a successful collaboration in TM Forum leading to an architectural model that can be eventually standardised and backed by a demo for energy sharing as a use case; this work can and should be matured further to be consolidated into the standards of SDOs as ETSI and ITU. Furthermore, the data sharing aspect and the data driven services aspect are continuously evolving areas that would need to be matured further to be better integrated into standards.

Online references related to the fellowship work

 <https://docbox.etsi.org/INT/AFI/70-Draft/AFI11v1.1/>

Advance on-card biometric comparison standards ISO/IEC 24787, ISO/IEC 17839, ISO/IEC 18584 series



Ieva Kersiene

*Senior Software Engineer, Zwiipe AS
Lithuania*

Sector

E-Identification and Trust Services

Engaged SDOs, WGs and TCs



ISO/IEC JTC 1/SC 17/WG 11 - Application of biometrics to cards and personal identification

ISO/IEC JTC 1/SC 37/WG 2 - Biometric technical interfaces (referenced standards)

ISO/IEC JTC 1/SC 37/WG 3 - Biometric data interchange formats (referenced standards)

Role

Member

Addressed EU standardisation priorities and gaps

The ongoing contributions to the Biometric System-on-Card related interindustry ISO/IEC standards address the following three key aspects:

1. Bridging Definition Gaps: The initiative aims to bridge existing gaps in definitions as outlined in the ISO/IEC 17839 series, specifically focusing on core, physical dimensions, and logical information exchange interfaces requirements. This involves a comprehensive examination and comparison with the latest hardware and software advancements prevalent in the market for biometric on-card verification-enabled smart cards. The emphasis is on ensuring that the standards are not solely rooted in theory but are backed by practical use cases.
2. Enhancing Clarity and Consistency: Addressing the ongoing challenge involves maintaining clarity and consistency in any standards revisions developed by ISO/IEC JTC1/SC17/WG11, particularly concerning other Standard Committees (SCs) and Working Groups (WGs) developed standards. This effort includes eliminating ambiguities and ensuring seamless alignment with cross-referenced ISO/IEC JTC1 SC37/WG3 and SC37/WG2 standards on BDIF (Biometric Data Interchange Formats) and CBEFF (Common Biometric Exchange Formats Framework) interfaces and formats.
3. Prioritising Practical Applicability: The standards development process places a significant emphasis on practical applicability by aiming for seamless integration in real-world interoperable scenarios. The main goal is to facilitate the straightforward integration and maintenance of the standard compliant biometric solutions within diverse-scale interindustry biometric systems, which typically accommodate hardware and software components provided by various vendors.

Concerned ICT Standards and contribution to the related landscape

The ongoing contributions encompass the most recent submissions of comments following the balloting process for the development of the following standards:

- ▷ ISO/IEC 17839-1 WD2 - Information technology — Biometric System-on-Card — Part 1: Core requirements.
- ▷ ISO/IEC 17839-3 WD2 - Information technology — Biometric System-on-Card — Part 3: Logical information interchange mechanism.

It is my belief that the technical and general comments submitted address the three key aspects mentioned earlier. The latest revision of ISO/IEC 17839-1 requires updates in core requirements to accommodate two standardised form factors of Biometric System-on-Cards (BSoCs) suitable for both contact-based and contactless, or contactless-only standard-compliant readers deployed globally. The hardware of smart cards (ICCs), power consumption, and flexible biometric sensor technologies have advanced since the publication of the previous revision, with proven implementations evaluated independently in the SC17/WG11 3rd party assessment conducted in 2023. Additionally, some requirements may be primarily theoretical in nature.

Furthermore, the latest revision of ISO/IEC 17839-3 necessitates updates to ensure compliance with the latest edition of the referenced SC17/WG11 Biometric On-Card Comparison (OCC) 24787-x series, as well as ISO/IEC 7816-11 and other normative standards referenced by SC17/WGs (e.g., ISO/IEC 7816-4). The computational complexity of the Biometric System-on-Cards (BSoCs) remains a challenging process. Therefore, well-defined communication between the terminal and card, along with a clear card feedback mechanism, is essential to ensure interoperability between existing or updated terminal infrastructure and standard BSoC solutions at the transport and application protocol layers. Resolving ambiguities and inconsistencies within and across the referenced documents is imperative, encompassing both normative and informative sections of the document.

Impact (on European SMEs, related projects or in society)

Impact on SMEs

Currently, global biometric authentication systems are widely deployed for diverse public and commercial services authorization. Common form factor smart cards, incorporating biometric capture and comparison within the card, offer a secure, sterile, and user-friendly experience for cardholders. Standards for Biometric System-on-Card (BSoC) and On-Card Comparison (OCC) solutions ensure compatibility with deployed interoperable biometric systems, enabling straightforward maintenance and upgrades, while avoiding vendor lock-in and proprietary limitations.

Impact on Society

Smart cards enabled with biometric card holder verification capabilities on a card via either On-Card Comparison (OCC) or full Biometric System-on-Card (BSoC) technology each offer enhanced security, privacy, inclusivity, and public health benefits while reducing fraud and identity theft.

Has your project directly involved or led to a specific recommendation or proposal for developing new or revised standards?

Yes. The ongoing contributions encompass the most recent submissions of comments following the balloting process for the development of the following standards:

- ▷ ISO/IEC 17839-1 WD2 - Information technology — Biometric System-on-Card — Part 1: Core requirements.
- ▷ ISO/IEC 17839-3 WD2 - Information technology — Biometric System-on-Card — Part 3: Logical information interchange mechanism.

Have the standardisation activities in your project led to specific deliverables?

Yes, I have contributed to official comment templates per ISO/IEC 17839-x WD2 series

What future efforts or activities are still necessary for your area of application?

The current fellowship includes contributions on multiple SC17/WG11 standards in progress in different revision stages WD, CD, DIS (now FDIS). Thus, the work is ongoing. Furthermore, certain comments, such as those pertaining to 17839-1/-3, needed to be postponed to the subsequent meeting due to the abundance of valuable input and technical discourse from numerous global experts regarding cutting-edge hardware and software advancements, feasibility of implementation, practical application experiences, and potential expansion to various form factors. Additionally, there is a strong consensus to eliminate purely theoretical requirements, instead favouring reliance on practical third-party independent evaluations, current market demand, as well as feedback from initial proofs of concepts (PoCs), pilots, projects, and vendor experiences.

Online references related to the fellowship work

 <https://www.iso.org/committee/45144.html>

Progress Extensible Minutiae Standard ISO/IEC 39794-2



Robert Mueller

*Independent Expert, Dr. Robert Mueller IT Consulting
Germany*

Sector

E-Identification and Trust Services

Engaged SDOs, WGs and TCs



ISO/IEC SC37 WG3 Biometric data formats

Role

Editor

Addressed EU standardisation priorities and gaps

The data format and compliance standards developed in ISO/IEC SC37 WG3 are used in Europe and world-wide for storing and transferring biometric data. Standardised formats enable interoperability across countries and industrial organisations. The currently published standards from ISO/IEC 19794 series have several flaws with respect to forward and backward compatibility as well as XML and ASN.1 compliance. SC37 therefore decided to develop the ISO/IEC 39794 series specifying extensible formats that are future proof.

With this fellowship I focus on ISO/IEC 39794 Part 2 that specifically covers finger minutiae as one of the most prominent biometric data formats.

The standard ISO/IEC 39794-2 has been brought to publication which was already sponsored by my previous StandICT.eu fellowship (under StandICT.eu 2023 Programme). It has been recognized during the FDIS stage that there is a defect in the standard affecting its backward compatibility. Technical comments were no longer possible according to ISO regulations. The working group SC37 decided that a technical corrigendum should be issued and nominated the applicant unanimously as the editor.

In this role, I focus on collecting comments from national bodies, preparing a proposed disposition, resulting in a new base text for advancing to ballot.

Concerned ICT Standards and contribution to the related landscape

The standardisation landscape for biometrics is evolving due to increased interest in automated identification of citizens for civil and governmental applications.

This has strengthened further during the pandemic avoiding personal contact and automating processes such as border management within the EU. The data formats specified by WG3 are used in various application profiles including also civil applications like e.g. payment or physical access control.

Standardised data formats for biometric data like ISO/IEC 39794-2 are essential for widespread adoption and interoperability. They allow common interfaces and exchanging components for various levels of a technical solution to be exchanged.

Impact (on European SMEs, related projects or in society)

Impact on SMEs

Standardised biometric data formats enable interoperability and exchanging system components like biometric capture devices, algorithms, storage systems. This is of relevance for SMEs who typically provide only a single component rather than an entire solution like industry leading large corporations – which sometimes may rely on proprietary data formats.

Impact on Society

Biometric user authentication is present in many applications. This covers not only smartphone usage but also banking, national ID, healthcare and border management. Citizens in Europe and beyond benefit from the use of open standards in civil and governmental applications allowing transparency, privacy and guaranteed level of service.

Has your project directly involved or led to a specific recommendation or proposal for developing new or revised standards?

Yes, I contribute to technical corrigendum to ISO/IEC 39794-2.

Have the standardisation activities in your project led to specific deliverables?

Yes. ISO/IEC 39794-2 has been published 2023-09. The amendment targeted with this fellowship is still in an early stage of the first working draft.

What future efforts or activities are still necessary for your area of application?

The amendment based on an annex from ISO/IEC 19794-2 will be broadcasted for review and commenting by national bodies as the first working draft and developed over the next few cycles.

Online references related to the fellowship work

 <https://www.iso.org/standard/72153.html>

3. Sustainable Growth



Development of ITS geographic data standardisation for highly automated driving - Phase 3



Loïc Blaive

Independent expert, Loïc Blaive ITS Mobilités Conseils EIRL France

Sector

Intelligent Transport Systems

Engaged SDOs, WGs and TCs



CEN/TC 278 Intelligent Transport systems /WG 7 "ITS spatial data"
ISO/TC 204 Intelligent Transport systems /WG 3 "ITS geographic data"
ISO/TC 211 Geographic information /JWG 11 "Joint ISO/TC 211 - ISO/TC 204 WG: GIS-ITS"

Role

Convenor of CEN/TC 278/WG 7

Expert contributor in ISO/TC 204/WG 3 and ISO/TC 211/JWG 11

Addressed EU standardisation priorities and gaps

With this fellowship, I aim to consolidate the European activities and strengthen the European participation in my ISO work group which is yet too limited. In terms of international developments, the priority has been set to the final consolidation of the ISO 22726 series. It has paved the way for launching the revision of its Part 1 which should start soon. In parallel, some finalisation work has been carried out to launch the DTS ballot about CEN ISO/TS 22726-20

Also, I continue the use case definitions in conjunction with the preliminary work items adopted in May 2023 by ISO/TC 204 about map updates in a satisfying way, as I initiated the revision work of ISO 14296 (of 2016) mainly focused on map data structures for cooperative ITS (C-ITS) that is a basis for the ISO/TS 22726 series. The challenge for this revision is to fit the requirements from the latest developments.

Globally, it is to reinforce the European influence on development to have the European needs and specificities considered by the project editor, and thus to counterbalance the influence of the non-European country leading the works in ISO/TC 204.

Concerned ICT Standards and contribution to the related landscape

With this fellowship, I continued the development of several technical specifications and other initiatives about geographic information applied to ITS and especially to automated driving (MHAD):

- ▷ ISO/TS 22726-1 and CEN ISO/TS 22726-2;
- ▷ Preparatory work to develop the future version of GDF ("Geographic data files") (PWI 5974);
- ▷ Joint task force between ISO/TC 204/WG 3 and CEN/ISO/TC 278/WG 7 about map updates (in association with the TN-ITS Platform and Sensoris ASBL) (PWI 23944-1 and -2).

As well, the revision of CEN/TS 17268 ("TN-ITS specification") has started with the creation of a PWI (december 2023) and intense discussions with the NAPCORE project leaders to define the outline of the revision.

Impact (on European SMEs, related projects or in society) Impact on Society

Standardisation of maps for connected and automated driving systems is a cornerstone for the deployment of such vehicles I see that it will indirectly have societal impacts on two key aspects: firstly, it contributes to the GHG emission reduction through a better use of vehicle engine, and secondly, I will favour societal inclusion of elderly and/or disabled people by keeping their ability to move.

Has your project directly involved or led to a specific recommendation or proposal for developing new or revised standards?

Yes, I contribute to the development of the following standards:

- ▷ CEN/TS 17268 “Intelligent transport systems - ITS spatial data - Data exchange on changes in road attributes” (ed. 2)
- ▷ CEN ISO/TS 22726-2 “Intelligent transport systems — Dynamic data and map database specification for connected and automated driving system applications — Part 2: Logical data model of dynamic data”
- ▷ ISO/TS 22726-1 “Intelligent transport systems — Dynamic data and map database specification for connected and automated driving system applications — Part 1: Architecture and logical data model for harmonisation of static map data” (ed. 2)

Have the standardisation activities in your project led to specific deliverables?

Yes, I have drafted technical specifications.

What future efforts or activities are still necessary for your area of application?

It is necessary to both continue this action and have more European experts involved to strengthen the European position: especially development of GDF 6 (where there is a clear lack of resources even if a collaboration with OGC could be initiated) and the revision of other technical specifications.

Online references related to the fellowship work

 https://standards.cencenelec.eu/dyn/www/f?p=205:7:0:::FSP_ORG_ID:6259&cs=164A194F2D8EB9ACD98538F3DDE9CA11B

 <https://www.iso.org/committee/54706.html>

 <https://www.iso.org/committee/54904.html>

■ Contribute to prISO 16757-5



Pierre-François Jullien

CEO, Atalane

France

Sector

Building Information Modelling

Engaged SDOs, WGs and TCs



CEN TC 442 Building Information Modelling (BIM) WG 2 Exchange information

Role

Convenor of AFNOR CN PPBIM/GE 2 (Mirror committee of CEN TC 442/WG 2)

Addressed EU standardisation priorities and gaps

There is a growing need for information about building services systems during the planning and design of buildings. The designers in building services must execute detailed calculations and simulations to ensure saving of energy and to satisfy hygienic and comfort criteria in heating, ventilation, air conditioning, and sanitary plants. They must provide improved documentation to verify the compliance with these requirements. The resulting designs must describe the complete plants without internal interference or intersection with the building.

These requirements can only be achieved with modern engineering applications like CAD- and CAE-systems, calculation programs, BIM tools, and management software.

Nearly all big manufacturers provide their own software (mostly for free) as electronic catalogues to select, to design, and to calculate their products. Unfortunately, none of these software solutions meets all the requirements of the planner, and each program contains only the product range of its manufacturer.

Required is a uniform, internationally standardised definition for product catalogue data interchange. Such a definition eliminates the need to manage different data formats and to use different software systems to deal with products of different manufacturers, and this leads to a significant reduction of costs for manufacturers and users. Integrating this data into BIM-systems (Building Information Modelling) allows data interchange between IT systems. In addition, to the benefit for planning, there will be a number of advantages for other software solutions, e.g. facility management and life cycle management.

VDI 3805 is the German standard that addresses these objectives in Germany since decades. However, this is an old standard that uses old technologies. Transforming it in an ISO standard, modernising it using recent ISO or EU standards will extend its benefits to the whole European community.

Concerned ICT Standards and contribution to the related landscape

In this fellowship, I contribute to developing further EN ISO 16757 that focuses on the support of manufacturers to provide their product data in standardised electronic product catalogues. Part 1 (Concepts, Architecture and Model) and Part 2 (Geometry) have already been published by ISO TC 59/SC 13/WG 11.

To ensure that the implementation of these principles in Part 5 are in line with existing or emerging BIM standards, the project team of EN ISO 16757 has been working over the last

three years in several standardisation projects mainly on CEN level. These standards form the basis for the modelling of product catalogues in EN ISO 16757:

- ▶ EN ISO 23386 (Building information modelling and other digital processes used in construction - Methodology to describe, author and maintain properties in interconnected data dictionaries)
- ▶ EN ISO 23387 (Building Information Modelling (BIM) - Data templates for construction objects used in the life cycle of any built asset - Concepts and principles (ISO/DIS 23387:2019))
- ▶ EN 17549-2 (Building information modelling – Information structure based on EN ISO 16739-1:2020 to exchange data templates and data sheets for construction objects Part 2: Configurable construction objects and requirements)

These standards form the foundation on which EN ISO 16757 Part 5 will be built. They are now mature enough and contain important aspects which are required for the exchange of complex product catalogues. Therefore, now the time is ripe for starting the specification of the product catalogue exchange mechanisms.

As these underlying standards have been mainly developed by CEN TC 442, the ISO 16757 project team decided to develop Part 5 in CEN TC442 under Vienna agreement, instead of ISO TC 59/SC 13/WG 11.

EN ISO 16757 has been waiting for the publication of EN 17549-2 for many years. It will be the first standard based on it and EN ISO 23386 and EN ISO 12006-3. As such, it is a bit experimental and may constitute a template for future standards.

Impact (on European SMEs, related projects or in society)

Impact on SMEs

This standard will permit the development of HVAC product catalogues that are not dedicated to a single manufacturer, but may include products from both large manufacturers and SMEs. Without such a standard, each manufacturer must develop its own, proprietary, product catalogue, which represents a cost that an SME manufacturer cannot afford.

Impact on Society

The EN ISO 16757-5 standard will enable HVAC product manufacturers to distribute their data on any BIM catalogue that complies with the standard: they will be able to distribute their data on several BIM product catalogues or change product catalogue supplier with minimum effort.

EN ISO 16757-5 will also enable calculation software suppliers to integrate all BIM catalogues complying with the standard, with a single exchange format. This will enable software users to seamlessly browse products described in different product catalogue platforms.

Has your project directly involved or led to a specific recommendation or proposal for developing new or revised standards?

Yes, I contribute to developing a new standard, EN ISO 16757-5.

Have the standardisation activities in your project led to specific deliverables?

The EN ISO 16757-5 Draft International Standard is currently under ballot in CEN and ISO

What future efforts or activities are still necessary for your area of application?

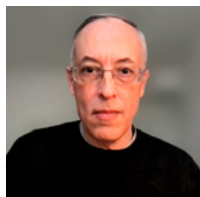
Further efforts will be required to consider the comments made by CEN and ISO on the DIS document, and to further develop the standard up to the FDIS stage.

Online references related to the fellowship work

 <https://www.cencenelec.eu/areas-of-work/cen-sectors/construction/>

 https://standards.cencenelec.eu/dyn/www/f?p=205:7:0:::FSP_ORG_ID:1991542&cs=100E563A3950D53807585F6A443ACB202

An information model for digital product passport information on sustainability and circularity



Leandro Navarro

*Professor, Universitat Politècnica de Catalunya
Spain*

Sector

Circular Economy Including Digital Product Passport

Engaged SDOs, WGs and TCs



Joint ITU-ETSI work items ITU-T SG5/Q7 L.D4PI and ETSI EE-EEPS64 “Information model for digital product information on sustainability and circularity”.

Role

ITU-T co-editor of this work item and coordination role as co-rapporteur of ITU-T Q7/SG5

Addressed EU standardisation priorities and gaps

Within my WG, we address the gap in the link between digitisation and environmental sustainability, and particularly of products and services. Specifically, digital devices and related elements ranging from materials to e-waste are a significant part of our environmental problem. We need reliable data about these digital, ICT, and electronic devices that become e-waste sooner or later. Access to digital data, such as linked data, with access to lists, datasheets, manuals, and guides, can facilitate and automate tasks but it is a big challenge as well with many potential benefits. For instance, it can facilitate circulation (maintenance, repair, reuse, recycling tasks) by providing support information for tasks that contribute to extended use. Helpful sustainability-related information can be about materials, design, usage, maintenance, repair, parts, and ways to dismantle and recycle them. That means information must be easily available, reliable, verified, and verifiable. Having all this information related to sustainability and specifically about circularity in digital and standardised format can facilitate and improve many processes, keep e-waste and devices accountable, etc. This is a central topic of the idea behind the “digital product passport” (DPP), with global references in UN ITU-T and regional initiatives by the EC.

The currently active joint ITU-ETSI work items ITU-T L.D4PI and ETSI EE-EEPS64 “Information model for digital product information on sustainability and circularity” (started in 10/2022), is working on going beyond and complementing that approved global (ITU) and regional (ETSI) standard and develop an information model that can cover different product categories in the domain of ICT products with focus on sustainability and circularity. This is the main priority of my fellowship work.

Concerned ICT Standards and contribution to the related landscape

Building on UN ITU-T L.1070: “Global digital sustainable product passport opportunities to achieve a circular economy” and it’s technically aligned (equivalent, different minor editing details) ETSI TS 103 881 standard (developed between May 2021-June 2023), also supported my previous fellowship by StandICT.eu 2023 Programme in its development back in 2022. In my current work, I continue as editor and expert in the joint ITU-ETSI work items

ITU-T L.D4PI and ETSI EE-EEPS64 “Information model for digital product information on sustainability and circularity”.

Impact (on European SMEs, related projects or in society)

Impact on SMEs

The DPP has the challenge of lowering, not raising (and avoiding additional burden), the barriers to participation by SMEs. It is particularly important to ensure European SMEs are included and supported, which is a major part of circular economy actors. It is particularly important that European SMEs find DPPs a way to communicate the sustainability advantages of their products better and that producing a DPP, and digitalising product information becomes an advantage and not an additional obstacle to SMEs. One of the advantages of ITU and ETSI over other standards development organisations is that these standards will be free and more accessible for SMEs.

Impact on Society

The digitalisation of product-related information has the aim to contribute to a transition to more environmentally sustainable and circular products. The market is huge, with billions of ICT devices produced every year. Having ready access to precise and verifiable product information in digital form allows many efficiencies across the interactions among businesses, public administrations, and citizens, usually called B2B, B2G, B2C, C2C.

Has your project directly involved or led to a specific recommendation or proposal for developing new or revised standards?

Yes, I support in developing new standard items; L.D4PI ITU-T work item and corresponding ETSI EE EEPS work item.

Have the standardisation activities in your project led to specific deliverables?

Yes, I have drafted technical specifications.

What future efforts or activities are still necessary for your area of application?

This work leads to a first consolidated result but there is ample work to develop in coming years. The digital product passport work has just started, and digitalisation is a great opportunity for product information.

Online references related to the fellowship work

 www.itu.int/ITU-T/workprog/wp_item.aspx?isn=18559

Contribution to a new standard for autonomous robotic systems IEEE1872.3



João Manuel Leitão Quintas

Coordinator of RTD unit - Laboratory of Automatics and Systems, Instituto Pedro Nunes

Portugal

Sector

Autonomous Robotics

Engaged SDOs, WGs and TCs



IEEE SA P 1872.3 REMAR - Ontology for reasoning on multiple autonomous robots

IEEE SA P1872.2 Autonomous Robotics (AuR) Ontology Working Group

Role

Expert member

Addressed EU standardisation priorities and gaps

My fellowship aims to contribute to ongoing efforts related to standardisation and European policy, advising on topics related mainly to Robotics and Autonomous Systems and Artificial Intelligence.

The key objective of the proposed activity is to contribute to the discussions and creation of resources that can support and facilitate the dissemination and adoption of standards, policy and guidelines proposed by key opinion leaders involved mainly in the recently created Working Group that is developing the standard project IEEE P1872.3 Standard for Ontology Reasoning on Multiple Robots (<https://standards.ieee.org/ieee/1872.3/11037/>)

In the current state of the art, the implementation of standard ontologies in Robotics and Autonomous Systems is still considered a challenge but is considered necessary. One of the main challenges faced by current working groups is still how to provide a unified way of representing the underlying semantics and defining the vocabulary to be used by the system, thereby allowing precise knowledge transfer for problem-solving and unambiguous communications between heterogeneous, autonomous systems.

The EU Priorities & Gaps identified that will benefit from the work conducted include Sustainable Growth / Robotics and autonomous systems and Societal Challenges / eHealth, healthy living, and ageing.

Concerned ICT Standards and contribution to the related landscape

With this fellowship, I contribute to the development and adoption of the IEEE P1872.3 standard, which is a logical extension to the IEEE 1872.2 and CORA ontology by defining additional ontologies appropriate for Autonomous Robotics (AuR).

This fellowship allows me a more effective participation of a European expert, and I can bring knowledge and perspectives from the European RTD ecosystem related to robotics and automation but also with the application domain of ICT for Health and Active and Assisted Living. From the application perspective, my work addresses “ICT for Healthcare” and “eHealth, healthy living and ageing”. Moreover, this activity is expected to influence the preparation of a technology-oriented standard by sharing concerns and requirements that

may be relevant for future adoption of the standard in concrete solutions targeting these sectors.

Impact (on European SMEs, related projects or in society)

Impact on SMEs

SMEs related to robotics and/or developing artificial agents with a certain degree of autonomy can be impacted by this contribution, as the standard being developed aims to bring added value for integration and interoperability in solutions based on robotic and autonomous systems.

Impact on Society

We are heading into a future where it is plausible that autonomous robots will be more affordable and available and have the capacity to support and help people carrying out several tasks related to personal assistance. This will be important for building solutions addressing the challenges emerging from societal demographic change. Solutions integrating robotics and autonomous systems that adhere to the standard should result in more interoperable, intelligent, sustainable, and cost-effective technologies.

Has your project directly involved or led to a specific recommendation or proposal for developing new or revised standards?

Yes. I contribute to IEEE P1872.3 that is a work in progress development of a new standard under IEEE Standard Association. Currently it has an active PAR (Project Authorization Request).

Have the standardisation activities in your project led to specific deliverables?

Yes, I have drafted technical reports on recommendations for this new standards.

What future efforts or activities are still necessary for your area of application?

The overall standardisation in terms of knowledge representations for Robotics and Autonomous Systems (RAS) are not sufficiently addressed, hence the motivation and need to continue creating new standardisation projects (e.g., IEEE P1872.3). Moreover, in spite of the existing active standards we can still observe a lack of adoption. Possibly because some RAS applications did not become yet mainstream, but this may be changing within the next 5 to 10 years, as other related fields evolve and societal challenges pressing demand for new technology-based solutions to be developed. Hence, it is my opinion that the state of maturity for the topic I am addressing is still in preliminary stage and requires a continuation of action.

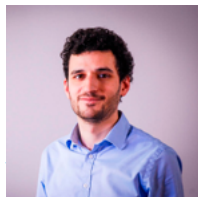
Online references related to the fellowship work

 https://standards.ieee.org/project/1872_2.html

 <https://standards.ieee.org/ieee/1872.3/11037>

 <https://github.com/joaquintas/aurora>

Bridging the gap between EU R&I ecosystem and worldwide standardisation on Smart Energy



Olivier Genest
Director, Trialog
France

Sector

Smart Grids And Smart Metering

Engaged SDOs, WGs and TCs



IEC SyC Smart Energy JWG3
IEC SyC Smart Energy CAG
ISO/IEC JTC1/SC41 Internet of things and digital twin AG6 Digital Twin
CEN/CLC/ ETSI CG-SG

Role

Co-convenor of IEC SyC JWG3 “Smart Energy Roadmap”, and member in others

Addressed EU standardisation priorities and gaps

My fellowship contributes to the following three focus areas: public sector information and big data, Internet of things, and smart grids and smart metering.

In the field of public sector information, open data and big data, I contribute to promote standardisation and support standardisation activities. Also, with my involvement in several European research and innovation projects, we aim at bridging the gap between the EU R&I ecosystem and IEC standardisation

In the field of Internet of Things, I have several objectives, including:

- ▷ Continue ongoing work in the area of semantic standards [...]
- ▷ Provide standards that can be used for compliance for IoT products, systems, applications and processes
- ▷ Promote the development and foster the adoption of the international Reference Architecture for IoT developed in ISO/IEC JTC 1/SC 41
- ▷ Further outreach to verticals to the Energy vertical
- ▷ Define the technical common ground of the Common European Data Spaces: Two EU projects where I am included, BRIDGE and IntNET will foster the cooperation between the 5 Energy Data Spaces projects.

In the field of smart grids and smart metering I focus on the following actions:

- ▷ Incorporation of SAREF into the full demand-side flexibility chain: SAREF is considered in BRIDGE and in IEC TS 63417 project.
- ▷ Collaboration with H2020 where the INTERCONNECT project is part of the BRIDGE network.
- ▷ Collaboration with HE projects on Energy Dataspace; where the BRIDGE network and IntNET are supporting the Energy Dataspace projects
- ▷ Development of the needed standards to support Alternative Fuels (incl. EVs): IEC TS 63460 will support the grid integration of EV charging infrastructure.

From IEC SyC Smart Energy perspective, the following challenges are tackled:

- ▶ Integration of new challenges such as virtualisation, digital twin, EV integration: into the smart energy roadmap (IEC 63097)
- ▶ Alignment of the e-mobility and grid perspectives to enable EV-based grid support functions: mapping of existing standards & standardisation gaps (IEC 63460)

Concerned ICT Standards and contribution to the related landscape

With my fellowship, I contribute to the IEC System Committee Smart Energy that deals with systems level standardisation, coordination and guidance in the areas of Smart Grid and Smart Energy.

The JWG3 “Smart Energy Roadmap” is a joint Working Group between the IEC SyC Smart Energy and the ISO/IEC JTC1/SC41 focusing on the Internet of Things and Digital Twin.

The purpose of this JWG is to map the existing standards with the relevant systems’ architectures, identify the standardisation gaps, and recommend the development of new standards by TCs. With its systemic approach, the JWG also supports the introduction of IoT and Digital Twin concepts into the smart energy domain and coordinates their integration into Smart Energy standardisation.

Two main standards are currently under development/revision within the JWG3:

- ▶ IEC TR 63097 Smart Energy Roadmap: the ongoing work aims to update this standard (dated 2017) the standards mapping and gap analysis, including novel technology trends such as virtualisation or digital twin, and identify new required standardisation efforts for smart energy.
- ▶ IEC SRD 63460 Architecture and use-cases for EVs to provide grid support functions: the purpose of this new standard is to define a common end-to-end architecture for EVs as DER/DESS, consistently with on-going activities from TCs such as TC69/120/57/..., and then to specify grid support functions to map them to existing standards and to identify standardisation gaps.

As co-convenor of this JWG3, I am leading the work on IEC TR 63097 update and following the work on IEC TS 63460. I have also been appointed by France as an expert to contribute to the IEC SRD 63460 project. In addition, I am making sure that the EU R&I results/experience from BRIDGE, ETIP SNET, OPEN-DEI and int:net is considered at worldwide standardisation level, with the support of CEN/CLC/ETSI CG-SG, and I am disseminating the relevant on-going standardisation activities to the four above mentioned initiatives.

Impact (on European SMEs, related projects or in society)

Impact on SMEs

The impact on European SMEs is twofold:

Firstly, my company (Trialog) is a European SME, which is impacted by my contribution. My activities in IEC SyC Smart Energy and ISO/IEC JTC1/SC41 allow me to be aware of on-going standards development in the field of IoT and Smart Energy, which is crucial for a company providing consulting and expertise on innovation. Also, my activities in the EU R&I ecosystem allow me to share experience based on our R&I projects and to learn from the experience of other projects and actors.

Secondly The European SMEs from the smart energy sector, in particular those involved in EU R&I projects, are impacted by my contribution on two aspects:

- ▶ Worldwide standards are better aligned with the EU R&I ecosystem, making it easier for European SMEs to make business at worldwide level (less specific development).
- ▶ The EU R&I ecosystem, including SMEs, is better aware of the standards, so its players can develop solutions which are already aligned to worldwide practices.

Impact on Society

My work supports the development of smart energy grids, allowing to integrate a high share

of renewable energy sources and to support new usages such as transports electrification (e-mobility). Smart energy grids also enable a more efficient operation of the energy systems (i.e. less energy losses) and foster an active commitment of grid users (i.e. consumers or prosumers) towards the energy transition.

Has your project directly involved or led to a specific recommendation or proposal for developing new or revised standards?

Yes, I contribute to the revision of an existing standard, IEC TR 63097 Smart Energy Roadmap, as well as to the development of a new standard IEC SRD 63460 Architecture and use-cases for EVs to provide grid-support function.

Have the standardisation activities in your project led to specific deliverables?

Yes, I have contributed to drafting a technical report.

What future efforts or activities are still necessary for your area of application?

The cross-fertilization between EU R&I ecosystem and worldwide standardisation on Smart Energy needs to be pursued. BRIDGE has launched in 2021 an action on "BRIDGE contribution to standardisation": the continuation of my work will allow to support the newly created BRIDGE Standards User Group, both by pushing EU R&I results to standardisation and by ensuring that EU R&I is aware of worldwide standardisation activities and results.

The update work of IEC 63097 is on-going, based on a methodology and supporting tools defined to enable iterative writing, validation, and publication of the updated content. Three first batches have already been completed and published. This work should be continued.

Finally, regarding the development of IEC 63460, the work started in September 2022 and discussions are ongoing to align the EU approach together with the US and JP perspectives. The finalisation of the document should occur in 2024.

Online references related to the fellowship work

 <https://www.iso.org/committee/6483279.html>

 https://www.iec.ch/dyn/www/f?p=103:14:204261071240084:::FSP_ORG_ID,FSP_LANG_ID:12621,34

 <https://syc-se.iec.ch/iec-63097-smart-energy-roadmap/>

Rapid Electromagnetic Emission Check of Fixed Installations



Marco Azpúrua

*CISPR Expert, Technical Assessor CISPR A JWG9, Universitat Politècnica de Catalunya
Spain*

Sector

Smart Grids And Smart Metering

Engaged SDOs, WGs and TCs



IEC TC 82 WG6 Solar photovoltaic energy systems
CENELEC TC219 Power Line Communications
CISPR A/B/H JWG 9; CISPR/CIS/B/WG 1, CISPR/CIS/B/WG 7, CISPR:
International special committee on radio interference.

Role

Member

Addressed EU standardisation priorities and gaps

There is a lack of standard procedures installers can employ to determine whether their installation work has caused new electromagnetic interference problems. The challenge is to develop guidelines to help detect major emissions problems in the field early to fix them promptly, in a proactive and preventive manner that are complementary and coherent with standard emissions tests as part of compliance assessment. The priority is to enable the appropriate test and measurement methodologies that, at the same time, help protect radio services while facilitating the deployment of installations like those from photovoltaic systems.

The second related gap concerns sophisticated, and expensive instruments used for typical EMC testing are not suitable for Rapid Emissions Checks on installations. Here the challenge is to provide recommendations regarding affordable and compact/portable EMI measuring instruments since installers are unlikely to invest in expensive equipment. In this sense, the priority would be the “Rapid Emissions Check” goal is intended to detect cases where installations emit noise significantly above the limits and give advice when more accurate measurements are required.

Finally, the third concerned gap relates to the difficulties in transferring knowledge from EU funded projects in the metrology domain into EMC standards. Here the challenge is to promote state-of-the-art emissions measurement methods based on time-domain techniques developed or under investigation in metrology-related EU-funded R&D projects from the different EURAMET's programs. In this regard, a very meaningful use case will be investigated: the emissions from PLC (power line communication) signals used on PV systems to remotely control the inverter, and optimizers. This will be carried out in collaboration with IEC TC82 – CLC TC219 (CENELEC).

Concerned ICT Standards and contribution to the related landscape

The Industrial, Scientific and Medical (ISM) sector is the primary beneficiary of the initiative to develop new EMC standards and guidelines in the form of technical reports for fixed installations. The main target project supported is the Rapid Emissions Checks, but also

many of the experts involved in CISPR A/B/H JWG 9 participate in the writing of the new CISPR 37 and in the maintenance of CISPR 11, all together are expected to have a broader influence on applications such as renewables and power chargers.

The development of the respective EMC standards for installations can improve the certification of PV farms, which will benefit end-users economically by reducing their energy consumption and allowing them to produce their clean energy. The production of new EMC standards can benefit companies that provide PV infrastructure and support the move to a low-carbon economy.

The validation and procedures developed will allow for faster certification and increased confidence in being compliant with European Directives. The use of standardised, repeatable, and traceable methods for in-situ EMC testing of installations and large-size/high-power equipment can lead to reliable test results for a wide variety of locations. This will benefit manufacturers, conformity assessment bodies, and consumers by improving compliance processes with the European EMC Directive 2014/30/ EU.

Through agile communication and coordinated interaction with the target committees CISPR\CIS\A (Radio-interference measurements and statistical methods), CISPR\CIS\B (interference in industrial, scientific, and medical RF apparatus), CISPR\CIS\H (Limits for the protection of radio services), the results from the project are being presented in the form of meeting presentations, reports, and datasets. Moreover, the collaboration with the IEC TC82 – CLC TC219 (CENELEC) contributes to the investigation of low-frequency, magnetic field emissions, from PLC signals in PV systems.

Impact (on European SMEs, related projects or in society)

Impact on SMEs

Firstly, there are specialised firms in the field of EMC, many of which can be categorised as SMEs. They stand to experience growth by offering novel testing services aligned with alternative procedures for demonstrating compliance with the EMC directive. This paves the way for the development of an entirely new business sector. Based on my personal experience as the founder of EMC BARCELONA, a company in this sector, I can attest to the demand from clients in Catalonia and Spain seeking on-site or specific location testing services. Moreover, Rapid Emissions Checks will become a new type of service. Training/ consultancy in that regard becomes business opportunities.

Secondly, the alternative test methods proposed in the standards I contribute to benefit both SMEs and larger enterprises during their product certification processes, resulting in reduced costs, diminished noncompliance risks, and accelerated time-to-market for their products.

Finally, I have been informed that my work as part of this fellowship has inspired colleagues from other European universities working on EMC, and they now want to create their own companies to address emerging needs for EMC testing and standard compliance assessment, which is a type of impact I was not expecting to encourage beforehand. Has your project directly involved or led to a specific recommendation or proposal for developing new or revised standards?

Yes. Have the standardisation activities in your project led to specific deliverables?

No, but technical reports, papers, presentations and datasets have been produced for the internal use of the working groups. Such information is shared internally through the IEC collaboration platform.

What future efforts or activities are still necessary for your area of application?

The growth of wireless connected devices and an increase in the sources of electromagnetic disturbances are changing the electromagnetic landscape. This can compromise the exploitation of the radio spectrum for enabling next generation connectivity technologies. Future efforts for the proper characterization of electromagnetic environments are necessary so we can set adequate protection limits and compatibility levels in standards.

Online references related to the fellowship work

 https://www.iec.ch/dyn/www/f?p=103:7:0::::FSP_ORG_ID,FSP_LANG_ID:1276,25

4. Innovation for Digital Single Market



Enhanced Interoperability of Spatio-Temporal Datacubes



Peter Baumann

ISO standard editor, rasdaman GmbH
Germany

Sector

Big Data

Engaged SDOs, WGs and TCs



ISO TC211 WG6 Geographic Imagery

Role

Member

Addressed EU standardisation priorities and gaps

My fellowship tackles the gap related to the insufficient models for achieving analysis-ready geo data. Here the priority is adding the OGC CIS 1.1 General Grid Coverage to 19213-2. The main challenge is to find an agreement across all stakeholders involved as datacubes have found wide interest as a cornerstone for analysis-ready data.

Concerned ICT Standards and contribution to the related landscape

A **coverage** in standardisation describes spatio-temporally extended phenomena, like temperature, wind, and magnetic fields, but also satellite image time series, among many others. Technically, it is the common abstraction unifying regular and irregular grids (aka datacubes), point clouds, and general meshes.

In ISO, 19123-1 (also edited by me) describes the concepts and terminology of coverage data that have been laid down whereas the concrete, interoperable coverage structures are defined in 19123-2. This 19123-2 was originally derived from OGC Coverage Implementation Schema (CIS) 1.0 following the common strategy of keeping OGC and ISO standards in sync. Meantime, however, OGC has advanced to CIS 1.1 introducing the **General Grid Coverage** structure which accomplishes simpler, yet more powerful handling of spatio-temporal datacubes.

With this fellowship, I focus on carrying over the General Grid Coverage definition from OGC CIS 1.1 into ISO 19123-2. This is technically well understood and not very controversial, therefore a smooth adoption process can be expected. WG6 has determined me to be both project lead and editor.

I am collaborating in an international team of experts with the following primary goals of creating technically sound, practically useful, implementation-proven specifications which are harmonised across the relevant bodies.

Impact (on European SMEs, related projects or in society)

Impact on SMEs

SMEs benefit from these standards as they give guidance for implementation and allow products to be interoperable with the tools available in the market. As SMEs typically do not commercialise huge complete suites but niche products, such interoperability and the capability to seamlessly integrate in overall solutions is critical. The ISO 19123-2 standard

defines interoperable data structures for spatio-temporal Big Data ready for consumption by further tools, such as AI.

Impact on Society

Never was it so easy to obtain information about land, water, atmosphere, as well as human impact on these. For such Big Earth Data, the concept of spatio-temporal datacubes is an established cornerstone.

This standards work is of highest practical relevance and visibility, with significant impact on the interoperability of geo data infrastructures and, ultimately, increased understanding of our planet and the impact we have on it.

Has your project directly involved or led to a specific recommendation or proposal for developing new or revised standards?

Yes, I am contributing to the revision of ISO IS 19123-2 Coverage Implementation Schema.

Have the standardisation activities in your project led to specific deliverables?

Work is in progress and is expected to result in an update of ISO 19123-2.

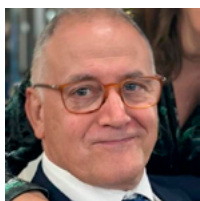
What future efforts or activities are still necessary for your area of application?

Following agreement among the ISO editing team which I lead the document can be submitted for ballot to become an adopted ISO standard.

Online references related to the fellowship work

 <https://committee.iso.org/sites/tc211/home/projects/projects---complete-list/iso-19123-2.html>

Standards for building simulation: a new ontology for building simulation O4BSIM



Pablo Vicente Legazpi

*Project Manager, Building Digital Twin Association, BDTA
Spain*

Sector

Digitisation Of European Industry

Engaged SDOs, WGs and TCs



CEN442 Building Information Modelling WG9 Building Digital Twins
UNE CTN332 SC1 and SC2

Role

Expert member

Addressed EU standardisation priorities and gaps

Mathematical simulation (or object-oriented simulation) is not economic due to the time-consuming process of modelling MEP equipment. Having MEP equipment modelled and standardised could make this process economic and a disruptive market technology. The final objective is to develop an initial ontology oriented to simulation in buildings.

A standard ontology representation (called O4BSIM) would be used to create a knowledge node between different platforms. Not only BIM models or IFC against simulation. If that ontology is open source and certified, use of the models is safe and compliant with AI regulations in the EU.

This “Standards for building simulation” would be the base for a new technical specification to be presented at CEN442 WG9 (Building Digital Twins).

Concerned ICT Standards and contribution to the related landscape

Today simulation in real time for construction is governed by industry de-facto standards, like FMI or OPC UA. Both are oriented to co-simulation integration (FMI, based on input-outputs) and communications with PLSs or SCADA systems (case of OPC UA). An ontology could be solving two main problems. First, the interoperability between open BIM (IFC schema) and simulation platforms. And second, the standardisation of mathematical methods to be used in models. This last approach would be an up-stream, mathematically oriented, and abstract standardisation, looking for comparable methodologies used for fluids, simplified equations or simulation connectors.

Impact (on European SMEs, related projects or in society)

Impact on SMEs

Simulation is at the top of functionalities in buildings or smart cities. It is an AI model-based approach, compatible with the European values and the AI Act, recently approved at the European Parliament. Standards for simulation will allow the use of these techniques, providing an increased knowledge and future AI implementations of governance. It will open new markets and services.

Impact on Society

Mathematical simulation can be a revolutionary tool for the renovation wave and new buildings design, but it needs a supporting standard for the components, which must be well defined, certified, and validated. We propose to represent this standard by using ontologies or semantic web technologies.

Has your project directly involved or led to a specific recommendation or proposal for developing new or revised standards?

Yes, very likely as the O4BSIM will be hopefully a technical specification presented at CEN442 WG9.

Have the standardisation activities in your project led to specific deliverables?

Not yet.

What future efforts or activities are still necessary for your area of application?

The ontology development is already in progress and first drafts are already done. The ontology will be presented at LDAC in June to software developers, to gain consensus and re-project scope and domains.

Online references related to the fellowship work

 https://standards.cencenelec.eu/dyn/www/f?p=205:7:0:::FSP_ORG_ID:3106339&cs=117003A1A52A114CEEE223DD2004335D7

Core Standards for Blockchain and Distributed Ledger Technology and Digital Currencies



Geoffrey Goodell

Lecturer, University College London
England

Sector

Blockchain And Distributed Ledger Technologies

Engaged SDOs, WGs and TCs



ISO/TC 307 Blockchain and DLT /WG 1 “Foundations”
ISO/TC 46 Information and documentation
/SC 11/JWG 1 “Blockchain”
ISO/TC 307/AG 3 “Digital Currencies”
ISO/TC 68 Financial Services
CEN/CLC/JTC 19 Blockchain and DLT

Role

Convenor of ISO/TC 307/WG 1

Co-convenor of ISO/TC 46/SC 11/JWG 1 “Blockchain”

Convenor of ISO/TC 307/AG 3 “Digital Currencies”

Head of UK mirror committee ISO/TC 307

Expert in other groups

Addressed EU standardisation priorities and gaps

In addition to having a direct impact on the ‘Blockchain and Distributed Ledger Technologies’ topic area, since our work items directly underpin EU objectives in this area, our work implicitly relates to ‘Fintech and Regtech Standardisation’, particularly in the context of digital currencies, for which we have specifically proposed a Vocabulary standard. This work also supports ‘Citizen centric digital public services’, ‘ePrivacy’, ‘Identity Management and Anonymisation’, ‘Privacy protection’, and ‘Smart Contracts’, all of which will be supported by our Vocabulary (ISO 22739:2024). The technical report on Blockchain and Distributed Ledger Technology in relation to authoritative records, records systems, and records management (ISO/WD TR 24332) will address challenges related to determination of the legal status of records in DLT systems and their suitability for institutional record management. Our newly proposed work item on Vocabulary for Digital Currencies (ISO/NP 24982), addresses a major challenge facing businesses and governments around the world concerning consistency of language for describing the technology and infrastructure underlying digital currencies (including CBDC) and decentralised finance.

Concerned ICT Standards and contribution to the related landscape

Through this fellowship project, I am directly pursuing the development, approval, and publication of the following standards:

- ▶ ISO 22739:2024 ‘Blockchain and Distributed Ledger Technologies – Vocabulary’, which was developed by a working group that I convened (ISO/TC 307/WG 1) and published in January 2024.

- ▷ ISO/TR 24332 'Blockchain and Distributed Ledger Technology in relation to authoritative records, records systems, and records management', for which I convene the working group (ISO/TC 46/SC 11/JWG 1) that has reached consensus to advance its most recent draft to Enquiry (DTR) stage.
- ▷ ISO/NP 24982 'Digital currencies – Vocabulary', which is currently under NP ballot, and which would be assigned to a new JWG between ISO/TC 68 and ISO/TC 307.

Impact (on European SMEs, related projects or in society)

Impact on SMEs

The standards that we are developing in the ISO WGs support the use of distributed ledgers, which are a core enabling technology for a plethora of applications that are useful to businesses and institutions. Such applications include tracking the provenance of assets, achieving decentralised agreement in creating documents, streamlining the reconciliation of transactions, and facilitating the transfer of value via tokenisation. DLT supports applications ranging from digital marketplaces to supply chain provenance and much more. These applications facilitate and enhance a wide variety of commercial activities among European businesses and feature prominently in active development of European regulations, including but not limited to eIDAS, EBSI, and some ECB initiatives on the development of a digital euro. Systems for payments and identity management will ultimately require regulation, which in turn will rely upon our efforts.

Impact on Society

Distributed ledger technology offers an opportunity to promote better management of data within public services, including for accounting and records management, as well as for electronic payments, particularly in the context of digital currencies, which represent an opportunity for central banks and financial regulators to provide a public payment mechanism that citizen-consumers can use independently of potentially exclusive custodial relationships. To provide citizen-consumers with democratic, cash-like bearer instruments, the value of tokenisation should not be understated, as the use of cash in much of the EU is declining, raising the question of whether our cash infrastructure will be economically sustainable over the long-term.

Distributed ledger technology facilitates the creation of digital bearer instruments through tokenisation, leveraging the immutability characteristic of the ledger that arises as an emergent property of agreement among participants in a decentralised system. There is an opportunity, therefore, to create digital tokens that can be held outside custodial accounts, which in turn allows for a cash-like means of payment that can be used in digital contexts, such as e-commerce and cashless retail point-of-sale systems.

Has your project directly involved or led to a specific recommendation or proposal for developing new or revised standards?

Yes. I have supported the approval of a new work item, Digital Currencies – Vocabulary (ISO/NP 24982). In my WGs, I also support, in the fullness of time, a new work item on Digital Currencies – Taxonomy and Ontology. For the avoidance of doubt, this work, which we have not yet proposed, should not be confused with any related work that might be ongoing on the further elaboration of ISO 10962 (Classification of Financial Instruments).

Have the standardisation activities in your project led to specific deliverables?

We published ISO 22739:2024, the revision to Blockchain and Distributed Ledger Technology -- Vocabulary.

Within ISO/TC 46/SC 11/JWG 1 Archives/records management – Blockchain, we agreed to advance ISO/TR 24332 to the DTR stage; we understand that the DTR ballot shall commence shortly. We expect to publish this technical report in 3Q 2024.

Within the context of TC 307/AG 3 Blockchain and distributed ledger technologies – Digital currencies, we socialised and promoted the idea of a new work item on Digital Currencies -- Vocabulary. This work item has been approved by TC 68 and we intend for the work to be done in a new JWG between TC 68 and TC 307.

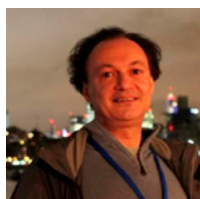
What future efforts or activities are still necessary for your area of application?

Next, within the concerned WGs, we must finish the task of responding to comments on the DTR ballot for ISO/WD TR 24332. Separately, we must finalise the election of Convenors and Project Leaders for the new JWG between TC 68 and TC 307 for digital currencies and its new project, Digital Currencies -- Vocabulary. Once this is done, we must begin work on the Vocabulary, with the possibility of producing a PAS along the way.

Online references related to the fellowship work

 <https://www.iso.org/committee/6266604.html>

Advancing ISO/IEC 23000-23 Decentralised Media Rights Application Format



Panos Kudumakis

*Senior Advisor, Independent Consultant
United Kingdom*

Sector

Blockchain And Distributed Ledger Technologies

Engaged SDOs, WGs and TCs



**ISO/IEC JTC1/SC29/WG03 MPEG Systems Smart Contracts for Media
Subgroup Reference standards**

Role

Chair of ISO/IEC JTC1/SC29/WG03 MPEG Systems Smart Contracts for Media Subgroup
Head of UK Delegation of ISO/IEC JTC1/SC29 (MPEG & JPEG)

Addressed EU standardisation priorities and gaps

Copyright legislation has continuously evolved so that fair, timely and transparent revenues are returned to artists and rights holders, e.g., US Music Modernisation Act and EU Digital Single Market Copyright Directive. Meanwhile, several key artists and media companies have turned their hopes for resolving these issues to blockchain, e.g., Open Music initiative by Berklee ICE in US and Mycelia by Imogen Heap in UK.

The EC Rolling Plan for ICT Standardisation (2024) also reveals that the most critical areas of blockchain standardisation for IPR management are interoperability, identity, and smart contracts.

The recently published ISO/IEC 21000-23 Smart Contracts for Media has already enriched DLT environments with inference and reasoning capabilities inherently associated with ontologies bridging the interoperability gap towards a semantic media blockchain. This standard will greatly assist the media stakeholders in achieving effective interoperability for exchanging verified contractual data between different DLTs. Such a process in turn will increase trust among the stakeholders for sharing high-value data (e.g., music rights) in the ecosystem.

Moreover, work has been initiated on ISO/IEC 23000-23 Decentralised Media Rights Application Format with aim to provide the means (e.g., APIs) towards enabling a fairer marketplace for rights holders and remuneration of authors and performers based on widely deployed MPEG technologies (e.g., audio-visual codecs, file formats, streaming protocols, and smart contracts) and non-MPEG technologies (e.g., DLTs, content and creator IDs). Such a decentralised media ecosystem has the potential to unlock the Semantic Web and in turn the creative economy; drive a shift of power in the media value chain (e.g., from the intermediaries to artists and rights holders); and facilitate greater fan interactivity and engagement, e.g., fans could be a partial owner of new works and even become creators of new derivative works.

Concerned ICT Standards and contribution to the related landscape

The MPEG Systems Smart Contracts for Media Subgroup, which I chair, has already published ISO/IEC 21000-23 Smart Contracts for Media in Nov. 2022. The latter supported by rich semantic copyright models can be handy when data-based decisions need to be derived by evidence and logic, leading to new business models that can be efficiently deployed on decentralised digital media platforms.

With respect to the latter, an additional challenge has been identified: the interoperability of such platforms beyond smart contracts. Thus, work has been initiated on ISO/IEC 23000-23 Decentralised Media Rights Application Format standard with scope to provide the means (e.g., APIs) towards enabling a fairer marketplace for rights holders based on MPEG technologies (e.g., audio-visual codecs, file formats, streaming protocols, and smart contracts) and non-MPEG technologies (e.g., DLTs, content and creator IDs). Its components will include: 1) smart contracts and DLTs (e.g., ISO/IEC 21000-23 Smart Contracts for Media); 2) rights metadata management (e.g., ingestion and queries); 3) content and creator IDs (e.g., ISCC – Content Codes and ISNI – Name Identifier); and, 4) file formats and streaming protocols (e.g., Tech Emmy® award winning ISO/IEC 14496-12 ISO Base Media File Format and ISO/IEC 23009 Dynamic Adaptive Streaming over HTTP). The focus will be on ISO/BMFF derived and widely deployed ISO/IEC 23000-23 Interactive Music Application Format and ISO/IEC 23000-19 Common Media Application Format for decentralised music and video applications, respectively.

ISO/IEC 21000-23 Smart Contracts for Media has bridged the interoperability gap towards a semantic media blockchain. ISO/IEC 23000-23 Decentralised Media Rights Application Format, built around DLT-agnostic ISO/IEC 21000-23 Smart Contracts for Media, is envisaged to unlock both the Semantic Web and in turn the creative economy.

Impact (on European SMEs, related projects or in society)

Impact on SMEs

EU Digital Single Market Copyright Directive aims to facilitate a fairer marketplace for rightsholders. Effective IP rights management in the digital environment is key to support the competitiveness of creative SMEs. Thus, creative SMEs need to be empowered to make better decisions and deploy more advanced solutions based on insights gleaned from data. ISO/IEC 21000-23 Smart Contracts for Media supported by rich semantic copyright models can be handy when data-based decisions need to be derived by evidence and logic, leading to new business models that can be efficiently deployed on decentralised digital media platforms.

Moreover, the interoperability of such platforms is addressed by ISO/IEC 23000-23 Decentralised Media Rights Application Format which building around DLT-agnostic ISO/IEC 21000-23 Smart Contracts for Media has the potential to unlock both the Semantic Web and in turn the creative economy.

Impact on Society

ISO/IEC 23000-23 Decentralised Media Rights Application Format building around DLT-agnostic ISO/IEC 21000-23 Smart Contracts for Media has the potential to unlock both the Semantic Web and in turn the creative economy. The latter is not only one of the most rapidly growing sectors of the world economy, but also a highly transformative one in terms of income-generation, job creation, export earnings, quality of life and social cohesion. Recent studies have shown that the creative sector is contributing 4.4 % to the EU GDP, while providing quality jobs to 8.3 million people across EU27.

However, the creative economy sector is highly mobile, representing both a risk and an opportunity. With the right investment, policy, regulatory and immigration regime, the EU could reap the rewards as a leader in this field. Get it wrong, and swathes of this highly internationalised workforce will relocate to Canada and the US, whose governments are working hard to create attractive conditions for growth.

Has your project directly involved or led to a specific recommendation or proposal for developing new or revised standards?

This project, towards enabling a fairer marketplace for rights holders and remuneration of authors and performers, initiated work on a new standard ISO/IEC 23000-23 Decentralised Media Rights Application Format currently at the Working Draft (WD) stage.

A revised standard ISO/IEC 21000-3 Digital Item Identification (2nd Edition) has also been

produced, consolidating its two amendments, and leaving out the associated registration authority to the discretion of stakeholders. The latter is currently at the Final Draft International Standard (FDIS) stage.

Have the standardisation activities in your project led to specific deliverables?

Yes, I have contributed to two technical reports, including:

- ▶ SC29/WG3/N1132 - WD of ISO/IEC 23000-23 Decentralised Media Rights Application Format
- ▶ SC29/WG3/N1089 - Text of ISO/IEC FDIS 21000-3 Digital Item Identification (2nd Ed)

What future efforts or activities are still necessary for your area of application?

ISO/IEC 14496-12 ISO Based Media File Format (ISO/BMFF) and ISO/IEC 23009 Dynamic Adaptive Streaming over HTTP (DASH) are widely deployed and Tech Emmy® Award winning standards. ISO/IEC 23000-23 Decentralised Media Rights Application Format is focusing on co-working of these standards with DLT-agnostic ISO/IEC 21000-23 Smart Contracts for Media, towards enabling a fairer marketplace for rights holders and remuneration of authors and performers. Thus, the future activities of the MPEG Systems Smart Contracts for Media Subgroup are concentrated on:

- ▶ Solicit further industry participation and contributions in the areas: 1) smart contracts and DLTs, 2) rights and metadata management, 3) content and creator IDs, and 4) file formats and streaming protocols, taking into consideration the latest developments on copyright and AI markings with respect to relevant regulations.
- ▶ Enhance collaboration with liaisons (e.g., ISO/TC 307/WG3, ITU-T Q.22/SG16, INATBA, W3C DIDs, ISO/TC46/SC9/WG18 ISCC and the European Commission) and conduct further dissemination activities (e.g., Digital Asset Management WG - Metaverse Standards Forum).

Of course, the competition is fierce (e.g., de jure vs de facto standards) and such efforts and activities require both media industry consensus and significant resources.

Online references related to the fellowship work

Resources for ISO/IEC 23000-23 Decentralised Media Rights Application Format

- 📄 Standard Specification: <https://www.iso.org/standard/86437.html> (Under development)
- 📄 Working Draft of ISO/IEC 23000-23: <https://tinyurl.com/y63zbfju>
- 📄 Technologies under Consideration for ISO/IEC 23000-23 <https://tinyurl.com/yc6snmtx>
- 📄 Join MPEG Systems Smart Contracts for Media Subgroup: <https://tinyurl.com/2bbukxfs>

Resources for ISO/IEC 21000-23 Smart Contracts for Media

- 📄 Standard Specification: <https://www.iso.org/standard/82527.html>
- 📄 Reference Software: <https://tinyurl.com/mrdfs9t>
- 📄 White paper (incl. slides): <https://tinyurl.com/2ne769wn>
- 📄 Short article: <https://tinyurl.com/57tmxcd4> (StandICT.eu Success Story)

Developing the ISO/TC307 Technical Committee Strategy for Standards Development in Blockchain & DLT



Paul Ferris

*Technical Expert, European Distributed Computing Association
Greece*

Sector

Blockchain And Distributed Ledger Technologies

Engaged SDOs, WGs and TCs



ISO/TC 307/WG5 Governance
ISO/TC 307/WG6 Use Case
ISO/TC 307/JWG4 Security
ISO/TC307/AG1 Strategic Business Plan RAG

Role

Convenor of ISO/TC 307/AG 1 SBP Review Advisory Group and expert in the other groups

Addressed EU standardisation priorities and gaps

This fellowship project has prioritised 'gap areas' where the lack of adequate DLT/Blockchain standards is slowing the formulation of government regulations and cross border agencies, or where ambiguity of language is causing confusion or slowing integration of distributed systems.

The related challenge to the specific topic areas have already been proposed that reflect the state of DLT/blockchain including Security, Value Transfer (incl. CBDC), NFTs, Identity, Metaverse, AI, Digital Product Passport, and Privacy. These will be approached in a way that reflects the EU's IT planning approach and strategy.

It is necessary that ISO/TC307 future planning encompasses a strong European perspective that brings (for instance) GDPR and eIDAS priorities to global and regional standards. The European Interoperability Framework has already been proposed as an organising model for the development of DLT/Blockchain standards. The urgent need for support of regulation with global standards is particularly keenly felt in the European, multilateral context. The EU has a particular interest in such standards and will benefit from strong regulations based on Global standards incorporating European values and norms.

This project is necessary in a quickly changing and developing technological landscape to meet the challenges of establishing a reliable digital trust framework. For example, the role of notaries, auditors and custodian services in distributed systems.

Moreover, there are growing concerns that trust of the security and privacy of identity management is being challenged by:

- ▷ Gaps that allow identity fraud, hacking of industrial control systems, financial crime and other cybersecurity attacks need to be addressed quickly.
- ▷ Issues addressing privacy (eg: GDPR, eIDAS, EBSI) and data mining (e.g. Cambridge Analytica) on a massive scale
- ▷ Global tech giants vision of a "metaverse" using AI and big data applied to profiling platforms where instead of viewing content, people are the content.

Concerned ICT Standards and contribution to the related landscape

With this fellowship, I contribute to the ICT Standards landscape by enabling the necessary time to be made available to plan and develop a strategy and business plan for the ISO/TC307 Technical Committee.

Blockchain and distributed ledger technologies standards Affected by this project:

- ▷ ISO/TR 3242:2022 - Use cases
- ▷ ISO/TR 6039:2023 - Identifiers of subjects and objects for the design of blockchain systems
- ▷ ISO 22739:2020 - Vocabulary
- ▷ ISO/TR 23244:2020 - Privacy and personally identifiable information protection considerations
- ▷ ISO/TR 23249:2022 - Overview of existing DLT systems for identity management
- ▷ ISO 23257:2022 - Reference architecture
- ▷ ISO/TS 23258:2021 - Taxonomy and Ontology
- ▷ ISO/TR 23455:2019 - Overview of and interactions between smart contracts in blockchain and distributed ledger technology systems
- ▷ ISO/TR 23576:2020 - Security management of digital asset custodians
- ▷ ISO/TS 23635:2022 - Guidelines for governance
- ▷ ISO/TR 23644:2023 - Overview of trust anchors for DLT-based identity management
- ▷ ISO/AWI 20435 Representing Physical Assets using Non-Fungible Tokens -
- ▷ ISO/PWI 24875 Secure Smart Contracts
- ▷ ISO/AWI TS 23353 on Auditing guidelines -
- ▷ ISO/WD TS 23516 on Interoperability Framework -
- ▷ ISO/WD TR 24332 on authoritative records, records systems, and records management
- ▷ ISO/AWI PAS 24874 on Use of Smart Contracts in Contributing to the Sustainable Development Goals -
- ▷ ISO/AWI TR 24878 on DLT/Blockchain Use Cases -

Impact (on European SMEs, related projects or in society)

Impact on SMEs

As an example, positive security is often quoted as justification for the use of DLT/blockchain systems but without quantifying or fully justified reasons. It may be the case that positive security impacts are only available where diverse organisations are aiming to share the same system. Alternatively, it may be that such systems would be more secure if they applied more traditional or alternative approaches to achieve similar ends. There are a confusing range of possibilities that SMEs are unlikely to be equipped to assess without a set of dependent standards to guide them. The criterion for making such decisions needs examination, and the approach comparative measurement needs standards to be effective. This project makes the links between the SMEs operating in the business arena and the standards development to support their operations.

Impact on Society

DLT/Blockchain technology is often referred to as 'the technology of trust'. This ISO features on my work at ISO/TC 307 and AG1 and explains the societal impacts of trust across finance, supply chains, digital trust, data provenance, Energy trading, records management, Anti-counterfeit pharma and food safety and provenance.

Has your project directly involved or led to a specific recommendation or proposal for developing new or revised standards?

The purpose of this work is to headline the priorities and justification for new standards. As convenor of TC307/AG1, the aim of this work is to produce a viable strategy for the whole technical committee, and so impacts all standards in process or coming up for review. I shall be making specific recommendations to the technical committee chair regarding which standards require development priority.

Have the standardisation activities in your project led to specific deliverables?

Yes, I have drafted technical specifications and technical reports on a developpement of a new standard and on reference material.

What future efforts or activities are still necessary for your area of application?

The involvement from the far East has grown over the years and in particular from China. In order to cover all the work in this committee, more experts from the EU are required. This is a particular issue in ISO/TC 307 since the fundamentals of distributed computing cover a very broad range of expert areas in technology, law, social impact and environmental issues.

Online references related to the fellowship work

 www.iso.org/news/isofocus_142-5.html

 <https://www.iso.org/standard/86280.html>

 <https://www.iso.org/standard/88312.html>

 <https://www.iso.org/standard/87416.html>

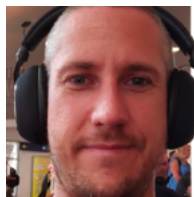
 <https://www.iso.org/standard/82098.html>

 <https://www.iso.org/standard/78465.html>

 <https://www.iso.org/standard/88312.html>

 <https://www.iso.org/standard/88315.html>

Consumer-Centric Blockchain Standards: A Holistic Approach to DLT Identity and Security Protocols



Christian Grafenauer

*Consumer Representative, DIN Verbraucherrat e.V.
Germany*

Sector

Blockchain And Distributed Ledger Technologies

Engaged SDOs, WGs and TCs



ISO/TC 307 Blockchain and distributed ledger technologies
CEN/CLC JTC 19 Blockchain and Distributed Ledger Technologies -
WG2 "Environmental sustainability"

Role

Expert and Consumer Representative for Blockchain and distributed ledger technologies

Lead Editor of consumer-related subsection of "Blockchain and distributed ledger technologies - Auditing guidelines"

Addressed EU standardisation priorities and gaps

Blockchain technology is poised to play a fundamental role in democratising internet technology, offering decentralised solutions that prioritise transparency, security, and user empowerment. In this context, the standardisation activity enabled through the StandICT.eu funding program has been instrumental. By addressing key priorities and gaps in blockchain and DLT integration, the experts' work lays a crucial foundation for the widespread adoption of this transformative technology. Their contributions not only bridge fragmented efforts but also foster a deeper understanding of blockchain's potential and provide essential guidelines for its responsible and effective use. These efforts pave the road for blockchain technology's adoption, ensuring that it aligns with European values and serves the interests of consumers and industries alike.

Important contributions and comments have been made to various projects improving the representation of consumer interests, consumer-centric design of technology and the protection of fundamental rights of users through trustworthy design and implementation guidelines.

Concerned ICT Standards and contribution to the related landscape

With this fellowship, I contribute to the development of several blockchain standards to improve the representation of consumers' interests. These include the following standardisation items:

- ▷ ISO/PWI 23095: 27002 for Distributed Ledger Services
- ▷ ISO/PWI 12833: Re-identification and Privacy Vulnerabilities in Blockchain
- ▷ ISO/PWI 23042 Decentralised identity
- ▷ ISO/NP TS 23353: Auditing Guidelines for Blockchain and Distributed Ledger Technology
- ▷ ISO/DTR TR 6277 Data Flows
- ▷ ISO/AWI TR 24878 New and emerging Blockchain and Distributed Ledger Technology Use

Cases

- ▷ ISO/AWI 24946 Requirements and guidance for improving, preserving, and assessing the privacy capability of DLT systems
- ▷ ISO/PWI 24875 Secure smart contracts
- ▷ ISO/PWI 24876 Privacy considerations for trust anchors in DLT-based Identity Management

Impact (on European SMEs, related projects or in society)

Impact on SMEs

The impact of the standardisation activity on European SMEs is achieved by aligning international standards with European directives, like GDPR, helping SMEs gain clarity and confidence in navigating regulatory landscapes, fostering an environment conducive to innovation and compliance. This clarity enhances trust among consumers and businesses, bolstering the reputation of SMEs and facilitating market expansion. Moreover, harmonised standards provide SMEs with a competitive edge in global markets, as they can offer products and services that adhere to both European and international standards. Additionally, the promotion of collaboration among stakeholders through the activity fosters synergy and prevents fragmentation, enabling SMEs to leverage collective expertise and resources effectively. Ultimately, the impact extends beyond immediate standardisation efforts, empowering SMEs to thrive in an increasingly interconnected and competitive digital landscape.

Impact on Society

By focusing on the standardisation of practices within blockchain and Distributed Ledger Technology (DLT), the activity directly addresses key areas impacting European consumers, industries, and public sectors. This ensures that the integration of these transformative technologies into mainstream industries is conducted responsibly and ethically. Secondly, this does not only strengthen Europe's economic leadership in the ICT sector, but also fosters job creation and sustainable growth. Thirdly, by prioritising consumer protection, the standardisation activity ensures that the rights and interests of European consumers are upheld as blockchain and DLT reshape industries. Standardised practices guarantee that consumer interests related to privacy, security, and usability remain paramount, thereby enhancing trust and confidence in these technologies. Fourthly, by emphasising interoperability and harmonisation, the standardisation activity facilitates seamless integration and collaboration across member states. This reduces friction and promotes a smooth digital single market experience for businesses and consumers alike, driving efficiency and competitiveness within the European market. Lastly, by addressing governance and regulatory alignment, the standardisation activity ensures that the decentralised nature of blockchain and DLT aligns with European governance and regulatory norms. This promotes transparency, accountability, and democratic values, safeguarding societal interests while embracing technological advancements. In conclusion, the impact of the standardisation activity on society is multifaceted, laying the groundwork for responsible, inclusive, and sustainable technological progress that benefits European citizens and society as a whole.

Has your project directly involved or led to a specific recommendation or proposal for developing new or revised standards?

This project has led to multiple contributions and comments, which have been welcomed by industry representatives and international experts and have been approved and integrated in the following standards:

- ▷ ISO/PWI 12833: Re-identification and Privacy Vulnerabilities in Blockchain
- ▷ ISO/PWI 23042: Decentralised identity
- ▷ ISO/NP TS 23353: Auditing Guidelines for Blockchain and Distributed Ledger Technology
- ▷ ISO/AWI 24946 Requirements and guidance for improving, preserving, and assessing the privacy capability of DLT systems

- ▷ ISO/PWI 24875 Secure smart contracts
- ▷ ISO/PWI 24876 Privacy considerations for trust anchors in DLT-based Identity Management

Have the standardisation activities in your project led to specific deliverables?

As a fundamental part of this project reports have been created by the expert to support the German consumer council at DIN Verbraucherrat e.V. so they can monitor and track the strategic direction international and European standardisation is taking.

Concrete contributions have been made to the projects “ISO/NP TS 23353: Auditing Guidelines for Blockchain and Distributed Ledger Technology” and very young project on “Environmental Sustainability” in CEN/CLC JTC 19 WG 2. Further contributions are already planned and have been discussed with the responsible experts in other projects, where contributions on consumer-centric aspects of technology standards have been explicitly requested by the technical experts. These contributions are being worked on and will be finalised and delivered shortly.

What future efforts or activities are still necessary for your area of application?

Consumer-centric and trustworthy technology design is still quite underrepresented in many areas of standardisation. Young technologies, like Blockchain and AI technology, are growing and developing so fast that the workload required to keep up with the multitude of new projects started and worked on in parallel is practically impossible on an exclusively voluntary basis. The continued funding of experts representing consumer interests and providing the other technical experts with reliable, in-depth contributions is required to further improve and maintain the level of quality of the overall work in European and international standardisation. Consumer interests and the sufficient protection of fundamental rights is a trend that has been supported with the StandICT.eu program and needs to be continued to ensure sufficient representation and influence of the civil society stakeholder group in standardisation.

Online references related to the fellowship work

 [ISO/TC 307 Blockchain and distributed ledger technologies](#)

 [CEN JTC 19 - Blockchain and distributed ledger technologies](#)

ISO/DIS 24138 – ISCC – International Standard Content Code



Sebastian Posth

Convenor, ISCC Foundation
Netherlands

Sector

Artificial Intelligence

Engaged SDOs, WGs and TCs



ISO/TC 46/SC 9/WG 18 – NP 24138 International Standard Content Code

DIN NID 09 NA 009 - 00 09 AA – Normenausschuss Information und Dokumentation

Role

Expert member

Addressed EU standardisation priorities and gaps

The main distinguishing feature of the ISCC in comparison to the existing media identifiers is the fact that the ISCC is generated from the media file itself. The ISCC can be generated by anyone with access to the media file without the need for centralised registries or other authorities that (manually) manage and assign the identifiers. The decentralised content identification is a major innovation for the media industries and the creative community.

Furthermore, the ISCC, as a content-derived identifier, bridges the gap between manually managed, higher-level content identifiers like work and product identifiers and their relations to digitally encoded manifestations of content. It is also a complementary standard to other content identifiers; ISCC can be used to support discoverability of other identifiers and metadata based on digital content. Currently, there is no decentralised, content-derived identifier standard for digital media assets with content matching capabilities (lightweight fingerprinting).

Concerned ICT Standards and contribution to the related landscape

In the context of this fellowship, I have been working solely on ISO/CD 24138, the International Standard Content Code. The ISCC is part of "ISO/TC 46/SC 9 Identification and description". Thus, the ISCC will become a sister standard to well known media identifiers, such as ISBN, DOI, ISSN, ISRC, ISWC, ISAN, and others. Representatives from registration authorities of these existing ISO standards are experts of WG 18 and actively contributing to the working draft.

Impact (on European SMEs, related projects or in society)

Impact on SMEs

An ever-increasing amount of digital content online is managed by large, mostly US-based corporations. In lack of an international standard those corporations use their own proprietary identifiers (Amazon ASIN, Google GKey/Content-ID, Apple-ID ...) to manage creator or user-generated content. This is inefficient, costly and creates a vendor lock-in.

The ISCC is designed as an open identifier standard to manage digital content in decentralised media environments. This is a fundamental prerequisite for efficient or automated content

licensing transactions online. The ISCC will support SMEs, i.e. creators, media organisations, retailers, platforms, collecting societies and other stakeholder from all media sectors in Europe, to claim rights to copyright protected works, prevent misappropriation and abuse online, to provide metadata and rights management information, support identification and authentication of original content and counter fake news and disinformation.

Impact on Society

One relevant use case for the ISCC is that it supports creators and rights holders to make declarations of digital media content together with proper metadata and credentials. This way, users and or online platforms can verify digital media content online, identify original content, distinguish it from disinformation and fake news, discover whether the content has been altered or maliciously manipulated, identify the original source and rightsholder of the content or get access to metadata and other information for context of the publication. A future ISCC standard may lead to a more secure and trustworthy online media environment.

Has your project directly involved or led to a specific recommendation or proposal for developing new or revised standards?

Yes, I have contributed to developing ISO/CD 24138, the International Standard Content Code.

Have the standardisation activities in your project led to specific deliverables?

Yes, to a technical report.

What future efforts or activities are still necessary for your area of application?

The standard is expected to be published as ISO 24138 in April 2024.

Online references related to the fellowship work

 <https://www.iso.org/committee/48836.html>.

 <https://www.iso.org/standard/77899.html>

 <https://core.iscc.codes/>

 <https://github.com/iscc/>.

Technical Editor ISO/IEC 27566 Age Assurance Systems - Framework



Tony Allen

Chief Executive, AVID Certification Services Ltd
England

Sector

Fin Tech and Reg Tech Standardisation

Engaged SDOs, WGs and TCs



ISO/IEC JTC1 SC27 WG5 - Identity and Privacy Management

Role

Technical Editor - ISO Project

Addressed EU standardisation priorities and gaps

This work feeds into the EU call for standardisation on age verification. The Commission have established a Digital Services Act: Task Force on Age Verification | Shaping Europe's digital future³. This includes a current call for standardisation Topic 12 SMP-STAND-2023-ESOS-01-IBA Age verification online. It is likely that this will be taken forward by a call for experts issued by ETSI, which I have been nominated to attend by BSI in the UK.

Concerned ICT Standards and contribution to the related landscape

This is a project with ISO/IEC JTC 1/SC 27/WG 5 addressing Identity Management and Privacy Technologies. It feeds into broader standardisation activity around digital identity (including the EUDI Wallet), child protection, prevention of exploitation and abuse, data minimisation, privacy preservation and security objectives.

Impact (on European SMEs, related projects or in society)

Impact on SMEs

European SMEs have been involved in European iterations of the IEEE 2089 project on age-appropriate design through a CEN/CENELEC working group. This helps to apply protections associated with the processing of children's data under GDPR, the implementation of the Audio-Visual Media Services Directive, the Digital Services Act, the AI Act and provisions relating to the control of age restricted goods, such as tobacco, pyrotechnics, alcohol and weapons.

Impact on Society

The development of international standards on age assurance ensures uniformity in verifying age across borders, fostering trust in various sectors like healthcare, education, and online services. This consistency enhances child protection measures, promotes safer online environments, facilitates age-appropriate content access, and strengthens accountability in age-sensitive industries, benefiting society globally.

3 <https://digital-strategy.ec.europa.eu/en/news/digital-services-act-task-force-age-verification-0>

Has your project directly involved or led to a specific recommendation or proposal for developing new or revised standards?

The project is currently working on three documents:

- ▷ ISO/IEC AWI 27566-1 – Age Assurance Systems – Part 1: Framework. This is likely to progress to CD Ballot in the Summer of 2024. We are aiming for publication in Spring 2025
- ▷ ISO/IEC AWI 27566-2 – Age Assurance Systems – Part 2: Benchmarks for Benchmarking Analysis. This is currently at Working Draft Stage and will be progressed through 2024 with likely publication in late 2025
- ▷ ISO/IEC PWI 27566-3 – Age Assurance Systems – Part 3: Interoperability, Technical Architecture and Guidelines for Use. This project is at preliminary work item stage, with a new project ballot likely to take place in May 2024. It is likely this document will work towards publication in 2027.

Have the standardisation activities in your project led to specific deliverables?

Yes, I am contributing to several technical reports within my WG. This work also engaged with ITU-T SG 17, on their new correspondence group relating to children's online protection (CG-COG), and with Specialist Task Force (STF) 681 (Reference Body TC HF) on AGE Verification Pre-Standardisation – VERIFY AGE project

What future efforts or activities are still necessary for your area of application?

There is still a long way to go with this project. Once the ISO/IEC standard is established, it needs to go through EU and national adoption processes. In addition, there remains work to be done on conformity assessment activities, the development of certification schemes and how the standards support and underpin regulatory outcomes.

The major forthcoming activity is a [Global Age Assurance Standards Summit \(ringcentral.com\)](https://ringcentral.com) in Manchester, UK in April 2024.

Online references related to the fellowship work

- 📍 The [Global Age Assurance Standards Summit \(ringcentral.com\)](https://ringcentral.com) is taking place on April 8 – 12, in Manchester, UK. It has attracted over 450 delegates, including 200 in person. The five-day summit is developed around five themed days – Monday – Setting Standards; Tuesday – Driving Improvement; Wednesday – Reducing Risk; Thursday – Discovering Innovation; and Friday – Delivering a Safer Online.

5. Societal Challenges



Navigating AI Ethics: Insights on AI Nudges, AI Competencies, Trust and Ethics Roadmap in EU



Enrico Panai

AI & Data Ethicist, Sardus France
France

Sector

Artificial Intelligence

Engaged SDOs, WGs and TCs



CEN/CENELEC JTC21 AI WG2 Operational aspects
CEN/CENELEC JTC 21 AI WG4 Foundational and societal aspects
ISO/IEC SC 42 JTC1 WG3 on "AI trustworthiness", "Ethics"
AFNOR Ethics committee on AI

Role

Co-convenor of CEN/CENELEC JTC 21 of WG4 "Foundational and societal aspects"

CEN-CENELEC JTC21 WG4 TG2 editor: "AI-enhanced nudging"

CEN-CENELEC JTC21 WG4 TG4 co-editor: "Competence Requirements for AI Ethicists Professionals"

CEN-CENELEC JTC21 WG4 TG5 contributor: "Ethics Roadmap"

Addressed EU standardisation priorities and gaps

As the co-convenor of JTC21 WG4, my role involves promoting collaboration between different stakeholders, guaranteeing that all projects adhere to CEN CENELEC's standards regarding ethics, sustainability, and European rights, and ensuring that the outcomes of these projects are in harmony with the global strategy of JTC21. In WG4, our focus is on the pivotal AI trustworthiness framework project, poised to become a harmonised standard underpinning the AI Act. The convenor's responsibility is paramount in creating this standard within the designated time and to a quality that meets the requirements of the European common market.

In the framework of this fellowship, I have addressed several critical gaps concerning ethics and the implementation of AI technologies in a way that aligns with European values and principles in:

- ▶ AI-Enhanced Nudging: There is a notable gap in current regulations and standards concerning AI-enabled nudges, particularly those that might undermine the dignity and safety of individuals, especially protected groups. This gap highlights the need for standards that specifically address the ethical use of AI nudges.
- ▶ Competence Requirements for AI Ethicists: The absence of unified qualifications for AI ethicists is a significant gap, impeding the integration of consistent ethical oversight into AI developments and deployments across different entities.
- ▶ Integrating European Values into AI Standardisation: Ensuring that European values, societal perspectives, and basic rights are consistently incorporated into JTC21's standardisation processes is a challenge, particularly when aiming to make these principles clear and understandable to stakeholders in the AI industry.

Concerned ICT Standards and contribution to the related landscape

As the co-convenor of WG4, I led the collaborative efforts across all projects, with a special focus on supporting the AI Trustworthiness Framework, which is essential for enforcing the EU AI Act. My goal is to achieve qualitative consistency across the other JTC21 Working Groups.

As the editor for “AI-enhanced nudging (TG2)”, I worked to build an international consensus towards a parallel development with ISO lead. By fostering collaboration and consensus among international stakeholders, the aim is to ensure that the development of standards for AI-enhanced nudging not only meets the highest ethical benchmarks, but also aligns seamlessly with global best practices as outlined by ISO. This approach underscores the necessity of synchronised efforts in standardisation to address the complex ethical, social, and technical challenges posed by AI technologies, ensuring their responsible deployment and use worldwide. In my capacity as co-editor of the “Competence Requirements for AI Ethicists Professionals (TG4)”, I contributed to build the body of knowledge and involve experts in the group. Furthermore, as a contributor to the “Ethics Roadmap (TG5)”, I worked actively for an alignment with the work produced in JTC21 with the ISO/IEC JTC1 SC42 WG3 on Ethical Aspect.

Impact (on European SMEs, related projects or in society)

Impact on SMEs

The work on ethics helps SME to apply guidelines or choose qualified professionals in the AI ethics field. The work on the AI trustworthiness Framework has a direct relevance with the EU AI ACT. In addition, my dedication to employing transparent and comprehensible language is central to making the standards accessible and practical, thereby fostering an ethical and human-focused artificial intelligence (AI) environment across Europe. This clarity in communication is crucial; it serves as a safeguard against misunderstandings in the application of AI technologies and helps SMEs to comply with European ethical principles.

Impact on Society

AI-powered nudges, especially when targeted at vulnerable demographics like children and seniors, introduce unique ethical challenges due to their potential to sway human actions. New challenges also arise from the misuse of nudges on the workforce. Thus, establishing a uniform language, processes, and ethical methods to regulate their application is paramount to avert unintentional harm. I aim to build a consensus-driven taxonomy around AI-enhanced nudging, incorporating perspectives from diverse sectors. This initiative aspires to foster a responsible environment with integrated mechanisms for feedback, evaluation, and oversight, enhancing AI trustworthiness throughout Europe. This standard can serve as a bridge between data quality, risk evaluation, and trustworthiness under the JTC21 umbrella.

Has your project directly involved or led to a specific recommendation or proposal for developing new or revised standards?

Yes, in the framework of this fellowship, my contribute to the development of several new standards, including the following efforts:

- ▶ CEN-CENELEC JTC21 WG4 TG2 editor: “AI-enhanced nudging”
- ▶ TG4 co-editor: “Competence Requirements for AI Ethicists Professionals”
- ▶ TG3 “AI trustworthiness Framework”
- ▶ TG1 “Green and Sustainable AI”

Have the standardisation activities in your project led to specific deliverables?

The fellowship is in process, and I have not delivered any deliverables yet.

What future efforts or activities are still necessary for your area of application?

For all the concerned standardisation items, the working draft is in progress or the ballot is under publication.

Online references related to the fellowship work

 https://standards.cencenelec.eu/dyn/www/f?p=205:22:0:::FSP_ORG_ID,FSP_LANG_ID:2916257,25&cs=1827B89DA69577BF3631EE2B6070F207D

Bias testing expert in CEN/CLC/JTC 21 AI Working Groups 2-4 at national and international level



Jurriaan Parie

*AI bias testing expert, Stichting Algorithm Audit
Netherlands*

Sector

Artificial Intelligence

Engaged SDOs, WGs and TCs



CEN/CLC/JTC 21 “Artificial Intelligence” WG 2-4 Operational,
Engineering, Foundational and Societal aspects

Role

Member JTC21 WG1, WG2, WG3 and WG4

Addressed EU standardisation priorities and gaps

The AI Act turns towards internal auditing obligations to protect, among others, fundamental rights in AI systems. There is however currently limited knowledge and experience how such audits can be conducted effectively in practice. When validating an AI system, one soon runs into difficulties. Which of the multiple available metrics should be used for measuring the fairness of data and algorithms? How can normative issues relating to proxy-discrimination and explainability requirements be resolved? These techno-ethical issues pose hurdles realising effective auditing mechanisms and supervision of auditing by first-, second- and third parties. To resolve these issues, gaining case-based experience in dealing with concrete normative dilemmas in AI systems is key. Since these dilemmas involve ethical considerations and trade-offs, they cannot be solved by technical standards only, but must involve collective deliberation by all stakeholders. Therefore, I am advocating for the inclusion of stakeholder panels in the procedures currently developed to assess fundamental rights in AI risk management systems (WG2), bias management systems (WG3) and trustworthiness frameworks (WG4). In these standardisation activities, I am advocating that resolving fundamental rights tensions is a context-dependent exercise and cannot be standardised. Rather procedural standards should be developed to discuss fundamental rights tensions in an open and inclusive manner within democratic sight.

Concerned ICT Standards and contribution to the related landscape

ICT Standards funding enables me to attend JTC21 WG1, WG2, WG3 and WG4 meetings and national commission gatherings of NEN (Dutch standardisation body). For me, as a newcomer to the field of standardisation, attending various international and national standardisation-related meetings is insightful. From my day-to-day work at NGO Algorithm Audit, I bring bottom-up knowledge to the world of standardisation how stakeholder panels can play a role to resolve difficult fundamental rights tensions in AI systems, for instance about bias testing. For JTC21 WG2's NWIP on Risk Management, I make contributions to defining where in risk management procedures fundamental rights should be assessed and resolved, and how AI model owners should communicate about these procedures. For JTC21's WG3, I contribute to the technical discussion of what exactly constitutes bias and how bias can be measured. For JTC21's WG4, I do preliminary work (PWI) to ultimately define a European standard for a

Fundamental Rights Impact Assessment (FRIA) for AI systems that are aligned with norms and values of the European Union.

Over the last months, I have given various presentations about the state-of-the-art stakeholder panels we are convening with NGO Algorithm Audit. I presented among others during:

- ▶ Algorithm Audit's Webinar on Standards for AI bias testing under the AI Act on Nov-17th 2023 with invited speakers of the European Commission and Dutch standardisation organisation NEN;
- ▶ ANEC's webinar on AI Act standards on Dec-6th 2023;
- ▶ JTC21's WG3 NWIP Bias requirements for managing bias in AI systems gathering on Dec-18th 2023;
- ▶ JTC21's WG1 Task Group "Inclusiveness" 6th meeting on Jan-8th 2024
- ▶ During the Plenary of JTC21 in Dublin 12-14th February 2024, I gave an in-person 10 minute presentation and Q&A about the role stakeholder panels play in resolving ethical issues when developing and deploying AI systems and argued that this way of working can be considered state-of-the-art.

Impact (on European SMEs, related projects or in society)

Impact on SMEs

European SMEs benefit from my work advocating for the inclusion of stakeholder panels to assess and resolve fundamental rights tensions in AI systems because our work contributes to legal certainty, thereby contributing to a stable and predictable environment for conducting business. The public knowledge coming forth from diverse and inclusive stakeholder panels of Algorithm Audit shed light in resolving complex fundamental rights tensions. Publicly available knowledge provides SMEs with useful guidance on how to self-assess high-risk AI systems, as mandated under the AI Act.

Impact on Society

European societies benefit from the inclusion of stakeholder panels in AI deployment as it places normative questions about AI in democratic sight, bringing normative questions about AI and technology to the political arena to debate different viewpoints in a free and open manner. As exemplified by Algorithm Audit's work in The Netherlands on (in)eligible input variables fed to machine learning-driven risk profiling methods and corresponding explainability requirements, society benefits when these types of normative questions underlying data modelling are 'demystified' and resolved within democratic sight.

Has your project directly involved or led to a specific recommendation or proposal for developing new or revised standards?

Yes, my project about the inclusion of stakeholder panels is directly involved in the development of new standards. Specifically, my contributions to JTC21 WG1-4 relate to the standardisation request of the European Commission on among others risk management systems for AI systems, on governance and quality of datasets used to build AI systems, on human oversight of AI systems and conformity assessment for AI systems.

Have the standardisation activities in your project led to specific deliverables?

My standardisation activities have led to multiple deliverables of which two are discussed in detail below.

The first deliverable concerns a case repository in which bottom-up case-based advice about normative questions, relating to proxy discrimination and organisational check and balances for responsible usage of AI, are mapped to the 10 harmonised norms as requested by the European Commission. This case repository links specific parts of existing algorithm validations by Algorithm Audit to among others risk management systems, data quality systems and accuracy specifications.

The second deliverable is the start of an AI Act standardisation cohort. In this cohort 4 other AI experts participate on behalf of Algorithm Audit to contribute to standard writing in WG2, WG3 and WG4 of JTC21. Given my experiences from the last 6 months contributing to these WGs, I help AI experts who are new to the world of standardisation with onboarding JTC21, providing guidance to use the ISO documents system and ultimately working together to write standards. The cohort officially starts on Apr-15th and last to the end of 2024.

What future efforts or activities are still necessary for your area of application?

To have useful standards that can be used when the AI Act comes into force, efforts must be stepped up in writing standards. Effective project management coordinated and dedicated involvement of AI experts is key to realise this. The idea behind initiating an AI Act standardisation cohort on behalf of Algorithm Audit aims to engage new AI experts to the world of AI standardisation and collectively contribute to standard writing.

Online references related to the fellowship work

📁 Case repository with harmonised standards being part of audit criteria: <https://algorithmaudit.eu/algoprudence/>

📁 AI Act standardisation cohort: <https://algorithmaudit.eu/knowledge-platform/standards/>

Standards for the next generation of information for Healthcare and Research, AI-Language Models-based



Carlos Luis Parra-Calderón

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Spain*

Sector

Artificial Intelligence

Engaged SDOs, WGs and TCs



ISO TC 215 Health Informatics WG1 Architecture, Frameworks and Models

Role

Member

Addressed EU standardisation priorities and gaps

My fellowship tackles the following gap, the standardisation of clinical information, as clinical information must be standardised to ensure the secure and effective use of language models in electronic health records (EHRs). This includes further work on mapping FHIR to ISO13606 and ISO 13940 based on the work of ISO/AWI TR 24305, with the goal of harmonising health informatics guidelines to implement HL7/FHIR based on these standards.

It is important to identify interoperability needs to meet the requirements of AI standards, specifically about the reference framework (ISO/IEC 23053:2022) and ISO/IEC AWI TR 18988 "Artificial Intelligence - Application of AI technologies in health informatics."

Current clinical information standards have not explicitly addressed biomedical knowledge representation and interoperability for healthcare and healthcare research applications, especially in adopting language models in healthcare.

Priorities:

This fellowship project aims to progress the harmonisation of standards, focusing on AWI-ISO 24305, between FHIR, ISO 13606, and ISO 13940. This includes addressing gaps in standards that will feed future revisions.

The aim is to implement the European Health Data Space by providing a standardisation resource for adoption at all European levels. This ensures that clinical, phenotypic, and epidemiological information is ready for use in language model architectures.

Also, with this work, I focus on the adoption of AI and linguistic models in EHRs. The aim is to establish a roadmap for health information and AI standards to ensure the effective and secure adoption of linguistic models in EHRs.

Finally, the work will address mapping challenges in ISO/AWI TR 24305 with a methodological impact on developing the European Health Data Space. This involves analysing each AWI work package's status, progress, and elements that require more substantial challenges.

Concerned ICT Standards and contribution to the related landscape

With this fellowship, I contribute significantly to the development of ISO/IEC AWI TR 18988 in several key areas, focusing on harmonising and advancing standards related to Artificial Intelligence (AI) technologies in health informatics.

My activity aims to advance the harmonisation between different clinical information standards, such as FHIR, ISO 13606, and ISO 13940, focusing on the new AI standards in ISO. This harmonisation is critical for the safe and effective use of language models in electronic health records (EHRs), a primary concern of ISO/IEC AWI TR 18988.

The activity also highlights the existing gap in standards that do not explicitly address representation, interoperability, and biomedical knowledge for healthcare and health research applications. By focusing on these areas, the project aligns with the objectives of ISO/IEC AWI TR 18988 by ensuring that standards address the evolving needs of healthcare informatics in the context of AI adoption.

My fellowship project identifies and analyses existing standardisation initiatives on AI language models for healthcare, their level of maturity, and their alignment with the European regulation on AI. This analysis will serve as a basis for developing and revising AI standards in health informatics, directly impacting the scope and direction of ISO/IEC AWI TR 18988.

I contribute to developing a Roadmap for the Harmonization of Health Information, AI, and Language Model Standards. This strategic planning document outlines the future direction of health informatics and AI standards development to ensure they are aligned and can effectively support the integration of AI technologies into healthcare applications, a core objective of ISO/IEC AWI TR 18988. Finally, it demonstrates the ability to navigate between independently developed clinical information standards and improve interoperability between them, in line with the objectives of ISO/IEC AWI TR 18988.

Impact (on European SMEs, related projects or in society)

Impact on SMEs

This contribution is intended to impact the development of new, more competitive AI-based Electronic Health Record products offered by European vendors.

Impact on Society

The contribution aims to align clinical information standards with AI advances in their application in healthcare and biomedicine to impact societal health and research significantly. By focusing on the interoperability of electronic health records and aligning various standards (FHIR, ISO 13606, ISO 13940) with new standards for AI adoption, the project contributes to developing standards for next-generation health information. This initiative is crucial to improve the use of data in AI models and make them safer and more efficient. The expected outcome is a standardised framework to support the effective implementation of AI in healthcare, facilitating the standardisation of interoperable, AI-ready patient data across Europe by fostering the implementation of the European Health Data Space.

Has your project directly involved or led to a specific recommendation or proposal for developing new or revised standards?

Yes, I am contributing to the development of a new standard, ISO/IEC AWI TR 18988 "Artificial intelligence - Application of AI technologies in health informatics".

Have the standardisation activities in your project led to specific deliverables?

This activity includes three reports as specific deliverables: one on language models in healthcare and their relationship with health information standards, one on contributions of such standards to established and developing AI standards, and one on a roadmap for harmonisation of health information standards, AI standards, and language models.

This activity does not plan to lead specific deliverables within standardisation projects within the SDOs involved.

What future efforts or activities are still necessary for your area of application?

The activity proposes an agenda for the future evolution of standards in the health information and AI domain to maximise the value of AI in healthcare and health research. Standards from ISO/IEC technical committees, such as ISO/IEC JTC 1/SC 42 Artificial Intelligence, ISO TC 215, and HL7 FHIR, will be considered. The level of fulfilment of these standards with European AI regulations and the European Healthcare Data Space will also be explored.

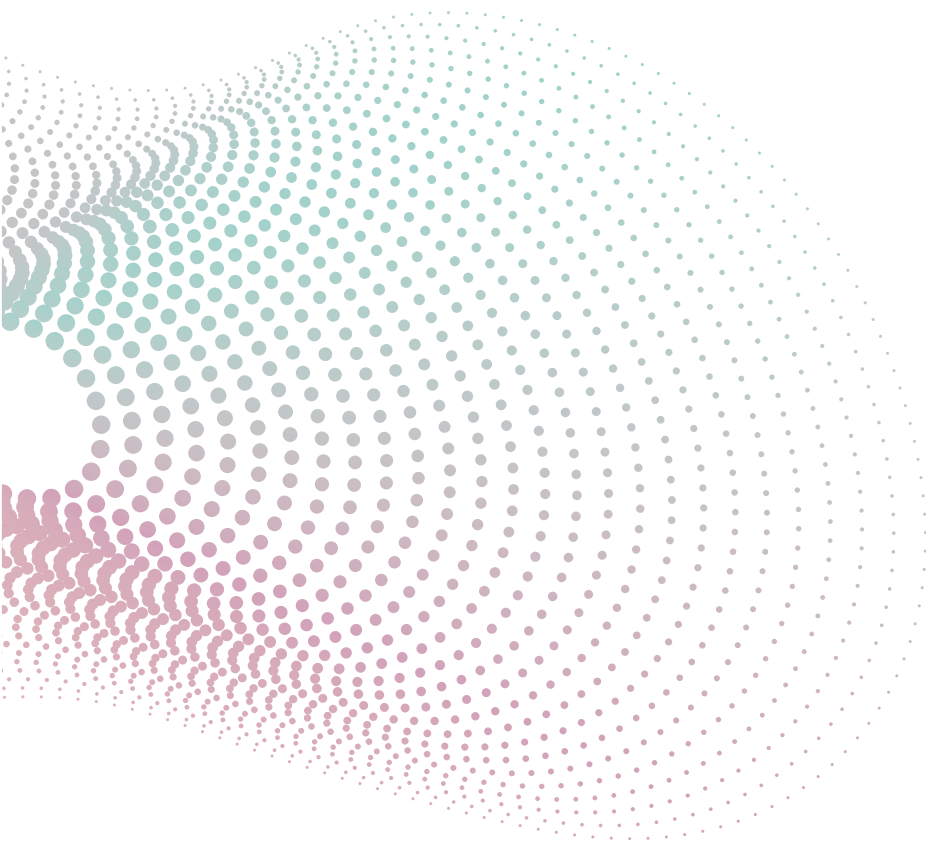
Online references related to the fellowship work

 <https://www.iso.org/committee/54960.html>

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

 <https://www.iso.org/standard/85602.html>

 <https://www.iso.org/standard/78390.html>





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