

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**

Third 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

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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 third 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 third open call.

Our team is delighted to showcase the third 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 2026 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 3rd 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 third 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 for ICT Standardisation, the SDOs, and even beyond, with all interested actors of our ever-growing StandICT.eu community.

In this funding batch, in total, **35 fellowships** were granted, tackling the five policy areas as defined in the Rolling plan for ICT Standardisation:¹

- ▶ **Foundational drivers: 7 fellowships** focusing on Cybersecurity Network and Information Security (5 fellowships), and e-Privacy (2).
- ▶ **Key enablers and security: 20 fellowships** focusing on Artificial Intelligence (7 fellowships), 5G/6G (2), electronic identification (5), Internet of Things (4), Quantum technology (2) and e-Infrastructures (1).
- ▶ **Innovation for Digital Single Market: 3 fellowships** focusing on Blockchain and DLT (2), and Metaverse (1).
- ▶ **Sustainable growth: 5 fellowships** focusing on Smart Grids, Smart Cities, Circular Economy, including Digital Product Passport as well as Robotics and autonomous systems.

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

Overview of the Open Call #3

The third open call was running from the 30th of November 2023 until the 9th of January 2024. It received 115 applications out of which 35 were selected for funding, with an overall 322,158 Euro granted.

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

The funded applications offer a large geographic spectrum with 11 different EU or associated countries (with most experts from Belgium, France, Italy, and Austria). 23% of the funded experts were female, reflecting the wider context of ICT professionals where the majority of the workers are male, and especially in the ICT standardisation context. Moreover, 34% of the fellows are new to the StandICT.eu programme, and the remainder are returning fellows who have already benefited from a funded StandICT.eu fellowship.

The retained fellowships are represented with a 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 the figure here below, a major part of the granted fellows have chosen their focus across a varied range of horizontal and vertical ICT areas; the most popular areas in this batch include artificial intelligence, cybersecurity, electronic identification as well as internet of things. Moreover, this funding batch is marked by a great variety of vertical ICT areas covered by the fellowships, namely in the field of digital product passport.

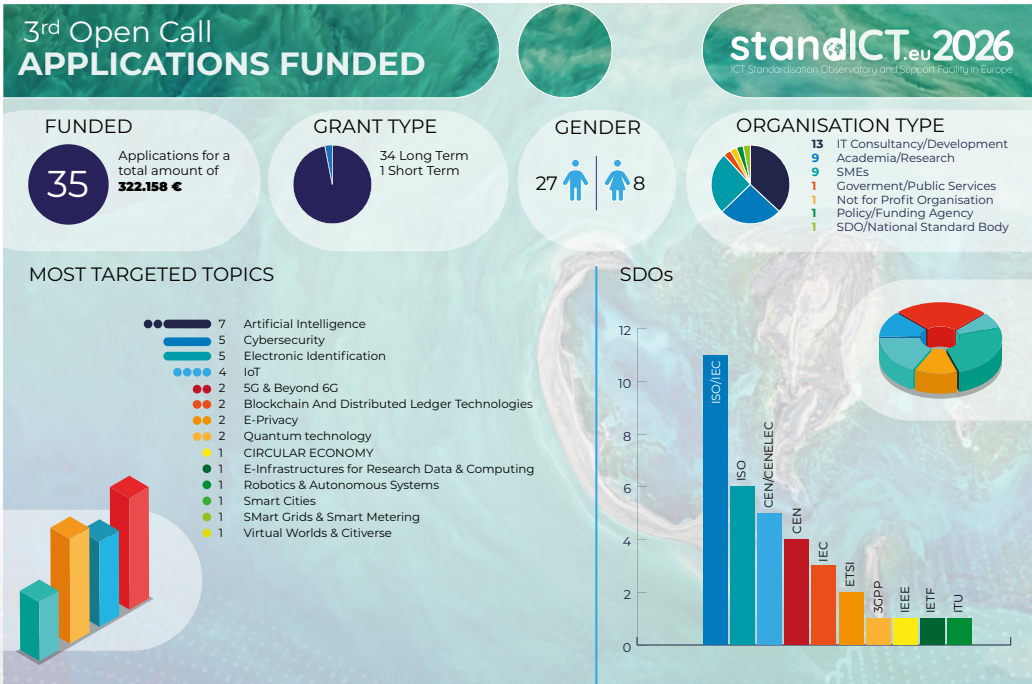


Figure 1 - Overview of the #3 Open Call key results and insights

Engaged SDOs, Organisations and European Projects

66% 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, 17 European funded and innovation research projects (see Table 1) are related to the engaged work in the OC#3 fellowships, with a focus on different horizontal and vertical technologies.

Table 1 – EU Projects related to OC#3 Fellowships

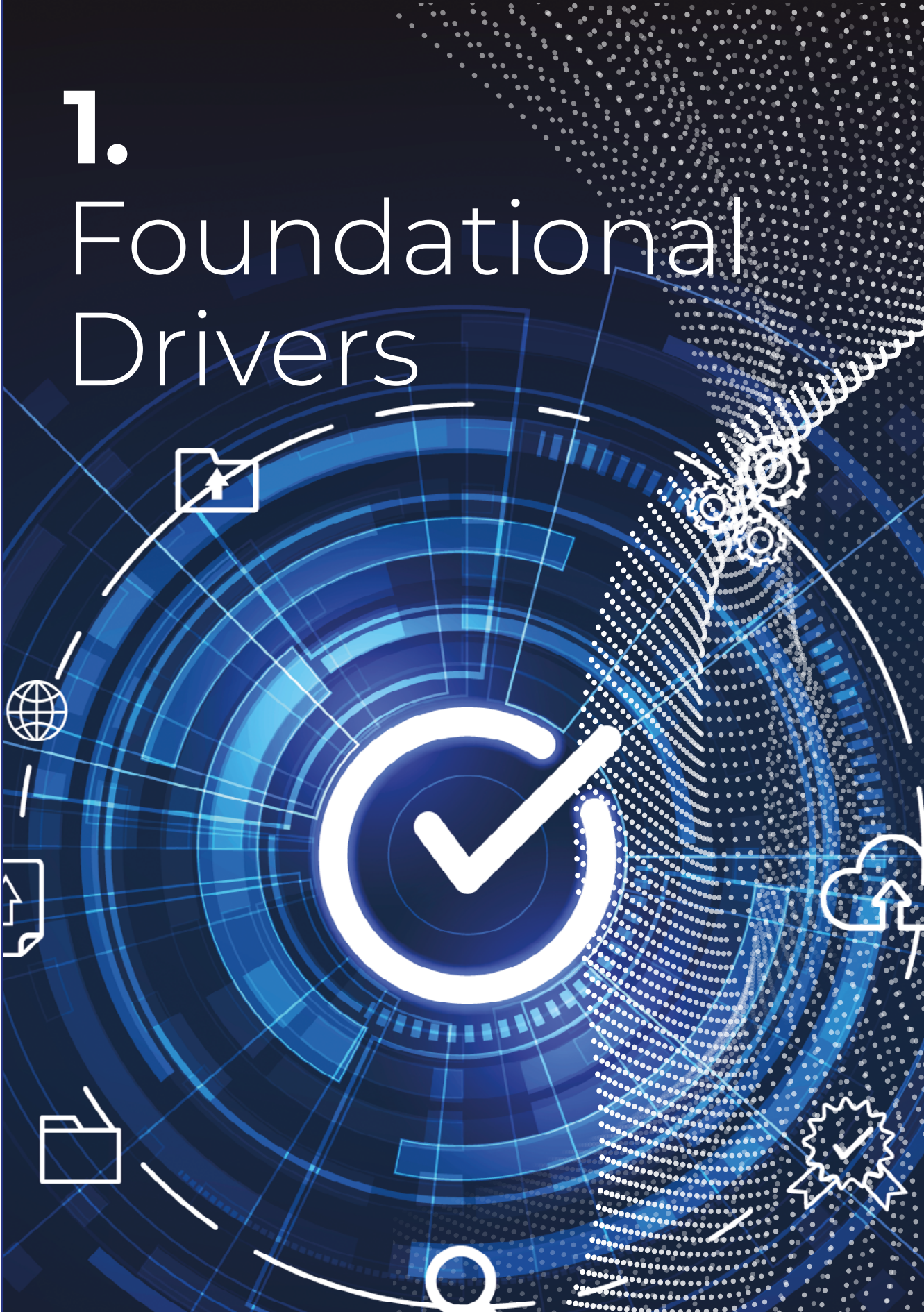
Project	ICT Area	Funding Programme	Related StandICT.eu Fellow
SOLARIS	ICT Governance	HEurope	Piercosma Bisconti Lucidi
LUCIA	eHealth	HEurope	
AI4HOPE	Artificial intelligence	HEurope	
SYNTHEMA	eHealth	HEurope	
InterConnect	Smart Grids and energy	H2020	Olivier Genest
GIFT		H2020	
SENDER		H2020	
MAESHA		H2020	
ENERGICA		HEurope	
ENERSHARE		HEurope	
SCALE		HEurope	
RESONANCE		HEurope	
PARMENIDES		HEurope	
HEDGE-IoT	Internet of things	HEurope	Witold Jacak
Quantum Random Numbers Generators JURAND	Quantum technologies	Polish National Centre for Research and Development project	
QU Test Horizon	Quantum technologies	HEurope	
ACCRA	Robotics	H2020	Amelie Gyrard

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



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



Christophe Stenuit

Viewconcept.be

Belgium

Sector

Cybersecurity Network and Information Security

Engaged SDOs, WGs and TCs



CEN/CLC/JTC 13 WG5 on Data Protection, Privacy and Identity Management
ISO/IEC JTC 1/SC 27 WG5 on Identity management and privacy technologies

Role

Editor of and contributor to standards related to identity, identification, authentication and privacy protection at SDO CEN/CLC/JTC 13 WG5 and SDO ISO/IEC JTC 1/SC 27 WG5

Addressed EU standardisation priorities and gaps

With this fellowship, I aim 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. This activity enhanced existing references, and encouraged promoting the use of these references through adoption at the European market.

Concerned ICT Standards and contribution to the related landscape

With this fellowship, I continued my engagement in fostering harmonisation of e-identity and privacy protection standardisation in Europe, contributing to ease the implementation of e-identity and e-privacy developments.

The scope of my funded activity includes proposing/revising/amending/reviewing standards. 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 29115 about Entity authentication assurance framework
- ▶ Integration of the referred standards with their amendments
- ▶ Adoption of the referred standards as prEN

I also did other supporting activities, for example, contributions on supporting standardisation activities in relation to, as part of the ISO JTC1 SC27 WG5:

- ▶ AG5 on strategy
- ▶ Development of threats associated with digital authentication and possible controls

- 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

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 therefore creating a difference in awareness of the consequences that may fall down improper compliance to good practices. Good standard references helped confidence establishment and maturity improvement in matters yesterday far from SMEs' concerns.

Impact on Society

The activity tackles societal challenges in three different axes:

Firstly, it supports secure societies by 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 citizens and societies are in place before authorised access to services is provided without compromising their privacy. Secondly, in the areas of 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. Thirdly, it enhances 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?

Yes. Part of the objectives of the project is to support systematic reviews, revisions, and amendments of existing work items. Another objective is to support the adoption and the publicity of these work items in the EU market, thereby guaranteeing the sustainability of existing references in a changing world.

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

Yes, I have contributed to several technical reports on common terminology, reference materials and recommendations for new and revised standards.

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

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 throughout 2024, producing publications during 2024 and 2025.

Online references related to the fellowship work

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

🔗 <https://committee.iso.org/home/jtc1sc27/>

■ Revision of ISO/IEC 15408-1:2022



Elzbieta Andrukiewicz

*Project Leader, National Institute of Telecommunications
Poland*

Sector

Cybersecurity Network and Information Security

Engaged SDOs, WGs and TCs



ISO/IEC JTC1/SC27 Information security, cybersecurity and privacy protection /WG3 Security evaluation, testing and specification

Role

Expert member

Addressed EU standardisation priorities and gaps

The Commission Implementing Regulation Act 2024/482 which introduces the EUCC - first European Cybersecurity Certification Scheme - sets up the operation starting date to 27 of February 2025.

Early and fast revision of reference standards is crucial for proper operation of national schemes gathered under the SOG-IS mutual agreement still being in use in 2024, and for the EUCC starting its operation at the beginning of 2025.

Using erroneous versions of reference standards could have adverse impact on the European cybersecurity certification market introducing unnecessary confusion, misunderstanding and in consequence, block the Single Digital Market growth which is one of the goals set up by the EU strategies.

The biggest challenge for the revision process is to meet the deadlines. Assuming the development of drafts would be faster than typical ISO stages, which usually are within 18 months, the SC27 can approve upgrading the project from the preparatory stage (20) directly to the enquiry stage (40), which is possible according to the JTC1 procedures. In that way the process of revision could be completed according to the plan and revised versions of ISO/IEC 15408 (multipart) and ISO/IEC 18045 – published by the end of 2024.

Concerned ICT Standards and contribution to the related landscape

Following the Cybersecurity Act delegation, the European Commission has published the Implementing Regulation 2024/482 that lays down rules for the application of Regulation (EU) 2019/881 of the European Parliament and of the Council as regards the adoption of the European Common Criteria-based cybersecurity certification scheme (EUCC)". Reference standards are indicated in Art. 3: Evaluation standards.

The following standards shall apply to evaluations performed under the EUCC scheme: the Common Criteria; and the Common Evaluation Methodology, which are equivalent to ISO standards.

- ▶ (1) 'Common Criteria' mean the Common Criteria for Information Technology Security Evaluation, as set out in ISO standard EN ISO/IEC 15408;
- ▶ (2) 'Common Evaluation Methodology' means the Common Methodology for Information Technology Security Evaluation, as set out in ISO standard EN ISO/IEC 18045;"ISO/IEC 15408 (multipart) and ISO/IEC 18045, versions from 2022, are under the revision.

Once the revision is finished Common Criteria and Common Evaluation Methodology (CC/CEM) will be published on the CCRA website², based on the agreement between the ISO Central Secretariat and several IPR stakeholders being participants of the CCRA arrangement.

Additionally, it is assumed that the adoption process for incorporating ISO/IEC 15408/18045 as European standards will be performed in synchronisation with the ISO processes of developing the revised versions.

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

Impact on SMEs

The goal set up in the revision plan is strongly supported by sound reference standards. The assessments can be repeatable and comparable, creating the basis for wide recognition of results which usually appear as certificates respected by all EU Member States.

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 ISO/IEC 15408:2022 (all parts) and ISO/IEC 18045:2022 that are assumed to be fast to cover urgent needs of the global market and expectations related to the opening of the EUCC in near future.

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

Yes, my fellowship contribution will result in the Updated document ISO/IEC DIS 15408-1.

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

Once the revision is done, we will disseminate it across the different stakeholders, and it will allow the community:

- ▶ to learn the newest editions of widely recognised international standards that support the cybersecurity certification and technical aspects of the process of revision;
- ▶ to show how the application of widely recognised international standards could support EU legislation related to cybersecurity certifications and possibly various certification schemes that would emerge in the future as the result of implementation of legal provisions (namely, Cybersecurity Act, Cyber Resilience Act, the European Chips Act, NIS2 Directive, among others);
- ▶ to apply the standards to security evaluation of the newest innovative technologies such as quantum key distribution and post quantum cryptographic algorithms.

Online references related to the fellowship work

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

² <https://www.commoncriteriaportal.org/cc/index.cfm>

Adaptive Context-Based Access Management for Critical Infrastructure



Samia Oukemeni

*Standardisation Expert, Vodafone
Germany*

Sector

Cybersecurity Network and Information Security

Engaged SDOs, WGs and TCs



IEEE INGR Security
IEEE INGR System Optimisation

Role

Expert member

Addressed EU standardisation priorities and gaps

With this fellowship I addressed several gaps related to cybersecurity standardisation. There is a lack in traditional AC systems of the dynamic adaptability necessary for addressing evolving cybersecurity threats and the lack of smooth transitioning between access technologies for seamless authentication backed by industry and researchers. Also, implementing ZTA, despite its effectiveness, is complex and resource-intensive. Transitioning existing frameworks to this more secure model presents significant challenges, especially when coordinating across diverse technologies within the 5G ecosystem. In addition, there is a pressing need for standardised Access Control as a Service (ACaaS) models. Existing AC mechanisms vary widely across different platforms and technologies, lacking a unified approach that ensures consistency and interoperability.

Consequently, the priority of this work is to contribute in developing a standardised ACaaS framework, providing a blueprint and architectural guidelines and to advancing the Zero Trust model in a modular way specific to critical infrastructure by ensuring rigorous verification and necessity-based access, significantly minimising vulnerabilities.

I can see several challenges in this work. Firstly, different industry players must endorse a standardised method. Secondly, enhancing the autonomy of Access Control systems by integrating behaviour analysis and risk threat intelligence presents a multifaceted challenge involving the development of sophisticated algorithms, seamless integration into existing infrastructures, continuous updates to address new threats and adherence to strict data privacy regulations.

Concerned ICT Standards and contribution to the related landscape

My work is based on IETF RFC 2903 and ITU-T X.812 and additional contributions standards will be part of IEEE standards.

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

Impact on SMEs

This standardisation project, where I am contributing to, will significantly impact European SMEs and societies by enhancing cybersecurity in critical infrastructures through the standardisation of ACaaS. By integrating ZTA, the project allows for more secure, scalable, and flexible access control mechanisms, which are crucial for the protection of sensitive

data and systems against evolving cyber threats. This approach reduces potential data breaches and security incidents, promoting a safer digital environment.

Furthermore, the project aligns with the EU's ICT Rolling Plan, supporting the EU's focus on improving cybersecurity and developing a resilient digital infrastructure. By adapting dynamic AC systems, the project enables SMEs to safeguard their technologies without significant upfront costs. This enhances their competitiveness and resilience, contributing to a more secure and innovative European digital market.

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

No.

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

Yes, I have drafted a white paper providing detailed explanations and descriptions of all the requirements and features necessary for the successful implementation and integration of ACaaS into the 5G ecosystem. The white paper will serve as a valuable resource for stakeholders, guiding them through the deployment and adoption of ACaaS within their systems.

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

After publication of this white paper, I will continue my engagements within IEEE and beyond to advance the field of access control and contribute to the seamless integration of ACaaS into the 5G ecosystem.

Online references related to the fellowship work

 <https://futurenetworks.ieee.org/roadmap>

Quantum Key Distribution (QKD) and Post Quantum Cryptography (PQC) : An equitable analysis



Angie Qarry Jaegermann

Founder & CEO/CTO, QDeepTech
Austria

Sector

Cybersecurity Network and Information Security

Engaged SDOs, WGs and TCs



CEN/CENELEC/ JTC 22 / WG 4 Quantum Communication and Quantum Cryptography

Role

Expert member

Addressed EU standardisation priorities and gaps

Quantum Key Distribution (QKD) and Post Quantum Cryptography (PQC) are two technologies that aim to protect / secure information processing, including protection against the quantum threat- the ability of quantum computing to break the current asymmetric key encryption and speed up the symmetric key encryption, both encryption primitives upon which our internet security is build. Therefore, they address partially overlapping market needs. The two technologies may be partially complementary and partly competing. Questions regularly arise about how the two technologies relate to each other at the EC policy and EU country levels, and how individual organisations make technological adoption decisions.

The gaps arise due to two reasons: firstly, multiple positions exist that have an implicit or explicit bias that reflects the organisation's interest's political, strategic, and national roadmap; secondly, great confusion in the market and among stakeholders about which technology provides Quantum Safe Cryptography solutions (QSC).

The challenges are the lack of a detailed analysis of their implementation and deployment due to the relative novelty of each technology and the fact that vulnerabilities and attacks are still under investigation.

With my fellowship, I work on a Technical Report (TR) that aims to provide an “equitable” analysis of how the two technologies relate to each other from a security point of view. The priorities to achieve the goals are to :

- ▶ Provide a detailed description of the two technologies: their theoretical foundations, their relation to the Information security landscape, their protocols and implementation, and their application scenarios.
- ▶ Demonstrate the complementary nature of the two technologies in relationship to each other;
- ▶ Demonstrate the advantages and the disadvantages of each technology.
- ▶ Demonstrate the hybrid/composite approach application scenarios (PQC - QKD),
- ▶ Provide Analysis of Application Scenarios.
- ▶ Provide the security measure of each possible application.

Concerned ICT Standards and contribution to the related landscape

QKD and PQC technologies are supported by (upcoming) standards from multiple standardisation organisations, including ISO/IEC, ITU-T, ETSI, NIST, and others.

Founded in 2022, the CEN/CLC/JTC 22 on Quantum Technologies has started its work, building upon two deliverables from the CEN and CENELEC Focus Group on Quantum Technologies (FGQT, 2020-2023): Standardisation Roadmap on Quantum Technologies and Quantum Technologies Use Cases. The CEN/CLC/JTC 22 shall produce standardisation deliverables in the field of quantum technologies. This field includes quantum enabling technologies, quantum sub-systems, quantum platforms & systems, quantum composite systems and applications. Under the JTC22, there are four Working Groups (WG) 1. WG1- Strategic Advisory Group(SAG); 2. WG2- Quantum Metrology, Sensing and Enhanced Imaging, and Quantum Enabling Technologies; 3. WG3- Quantum Computing and Simulation; 4. WG4- Quantum Communication and Quantum Cryptography.

My fellowship focuses on one of the working Items (WI) in WG4. It has been accepted and has been under development since November 2023.

WG4-Quantum Communication and Quantum Cryptography has the following Working Items: 1. Gap analysis of current quantum communication and cryptography standards; 2. Quantum network best practices; 3. QKD and PQC - An equitable analysis.

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

This technical report, resulting from my fellowship's contributions, is an equitable analysis of the relationship between Quantum Key Distribution (QKD) and Post-quantum Cryptography (PQC) technologies. It describes the two technologies' complementary nature and highlights their potential advantages and benefits.

The European Cybersecurity Act underscores the crucial role of the EU market in relation to emergent technologies such as AI and quantum computation, which pose a threat vector to information security. Recognising this, the European Commission invests significantly in developing a QKD European Network, and the European Space Agency is actively involved in numerous free space QKD communication projects.

The development of this standard is significant to the European market, mainly because Europe is pushing very hard for the development of QKD while NIST favours PQC.

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

Yes, my fellowship focuses on one of the working Items (WI) in WG4 of CEN/CENELEC/JTC22, which aims to develop a new standard for QKD-related technologies.

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

Yes, I am working on a technical report that is an equitable analysis of how the Quantum Key Distribution (QKD) and Post-quantum Cryptography (PQC) technologies relate, and it lays the foundation for future standards.

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

The development of standards for quantum technologies under the CEN/CENELEC/JTC22 started in March 2023 in a plenary meeting in Berlin in DIN offices. The structure of the whole committee was decided, and the work was divided into four working groups. The work started in September 2023 and was first reported in November 2023 in a plenary meeting in Turin. The structure of the technical report for the proposed project was

accepted, and the work started. The status is a work in progress. The explanatory part of each technology is mainly finalised separately. The terminology of the life cycle is still under discussion. A consensus on the terminology also means a clear path towards the analysis.

Online references related to the fellowship work

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

AI & Cybersecurity Standards in Education: A Collaborative approach for Safer Learning Environments



Sandra Feliciano

*Invited Adjunct Professor, AESTAS INSIGNIS - Investigação e Suportes de Apoio à Gestão, Unipessoal, Lda.
Portugal*

Sector

Cybersecurity Network and Information Security

Engaged SDOs, WGs and TCs



ISO/TC 232 Education and learning Services
CEN/TC 353 Information and Communication Technologies for Learning, Education and Training
IPQ/CT 187 Formal, non-formal and informal learning

Role

Head of Delegation at ISO/TC 232 Education and learning Services

Head of Delegation at CEN/TC 353 Information and Communication Technologies for Learning, Education and Training

Chair of IPQ/CT 187 Formal, non-formal and informal learning

Addressed EU standardisation priorities and gaps

My fellowship focuses on several priorities and key gaps related to AI and cybersecurity standards applied in education. These include the following:

- ▶ **Standardisation Gap in AI Implementation:** There is a lack of standardised guidelines for implementing AI in educational settings. This project aims to fill this gap by developing guidelines that ensure a harmonised approach across countries.
- ▶ **Cybersecurity Risks in Education:** Educational institutions are increasingly becoming targets of cyber threats. This project addresses the challenge of safeguarding sensitive educational data and ensuring the privacy and security of students and staff in the digital environment.
- ▶ **Educator Preparedness:** As per Rose Luckin's insights, there is a significant gap in educators' confidence in understanding and safeguarding against AI threats. This project aims to equip educators with the necessary skills and knowledge to confidently use AI tools in a secure manner.
- ▶ **Ethical Use of AI:** The project addresses the challenge of ensuring ethical AI usage in education, focusing on issues like transparency, accountability, and bias. This is crucial in maintaining trust in AI technologies among educators, students, and parents.
- ▶ **Diverse Educational Landscapes:** Europe's diverse educational landscape presents a challenge in implementing a one-size-fits-all approach. This project aims to develop flexible guidelines that can be adapted to different educational systems and cultural contexts within Europe.
- ▶ **Keeping Pace with Technological Advancements:** AI is a rapidly evolving field. The project addresses the challenge of keeping educational standards up-to-date with these advancements, ensuring that educators and students are prepared for the future.

Concerned ICT Standards and contribution to the related landscape

This project proposes the development of two new standardisation documents, namely two new ISO International Workshop Agreements (IWA) with guidelines on how to implement

- ▶ ISO 27001 - Information security management system - requirements
- ▶ ISO 42001 - Artificial intelligence management system - requirements in educational organisations.

It therefore contributes to the ICT Standards landscape by, on one hand, adding two IWA to the ISO catalogue and, on the other, contributing to market adoption of both ISO 27001 and ISO 42001 by providing sector-specific guidelines.

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

Impact on SMEs

It impacts educational organisations in any country and of all legal forms and sizes (including SME), and also includes training departments of SMEs from other economic sectors.

Impact on Society

My fellowship is focused on developing sector-specific guidelines for the implementation of AI and cybersecurity standards in educational organisations, and it aligns closely with the major priority of “Foundational driver - Cybersecurity/Network and Information Security”, intersecting significantly with the secondary priorities of “Foundational driver - E-Privacy,” “Societal change - Digital Skills,” and “Key enabler - Artificial Intelligence.

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

Yes, my fellowship project proposes the development of two new work items to IPQ and ISO: Two International Workshop Agreements (IWA) with guidelines on how to implement ISO 27001 and ISO 42001 in educational organisations.

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

Yes, I contributed to drafting two International Workshop Agreements (IWA) with guidelines on how to implement ISO 27001 and ISO 42001 in educational organisations.

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

The work is ongoing, and we continue to develop ISO International Workshop Agreements (IWA), to overcome the issues with scope and competence.

Online references related to the fellowship work

📄 <https://www.iso.org/committee/537864.html>

📄 https://standards.cencenelec.eu/dyn/www/f?p=205:7:0:::FSP_ORG_ID:580446&cs=IA6FFC6E92A2A55F2CA96600009719A4E

Strengthening security and privacy of biometrics applications through standards



Julien Bringer

CTO, Kallistech

France

Sector

E-Privacy

Engaged SDOs, WGs and TCs



ISO/IEC JTC 1/SC 27 Information security, cybersecurity and privacy protection

ISO/IEC JTC 1/SC 27/WG3 Security evaluation, testing and specification

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

ISO/IEC JTC 1/SC 37 Biometrics/WG 5 Biometric testing and reporting

ISO/IEC JTC 1/SC 37/WG3 Biometric data interchange formats

CEN/CNLC JTC 13 Cybersecurity and data protection

Role

Member, and project leader of ISO/IEC 27553-2 and of ISO/IEC 19792

Addressed EU standardisation priorities and gaps

My fellowship addresses privacy protection, cybersecurity, identity protection, and potential applications of biometric technologies. It leads and contributes to on-going projects in ISO/IEC JTC 1/SC 27 and SC 37 related to biometrics authentication and identification to enforce highest security and privacy requirements to protect end-users following the core principles of EU personal data protection regulation, and even further by enforcing security and privacy by technical design. ISO/IEC JTC 1/SC27 has published a new standard (late 2022) 27553-1 on security and privacy requirements for biometrics authentication towards remote services when biometrics information remains on a mobile device. However, there are already many deployed solutions for which some biometrics information are sent remotely, without clear guidelines or requirements, thus leading to huge risks for end-users. SC27 has thus also initiated a new project 27553-2 for the cases where some info is sent to remote services. It is critical to support this project with a strong basis to lead the way toward privacy and security by technical design and to enforce the highest practices for a better protection of end-users. The activity aims to lead the development of the next drafts (aiming for DIS stage in the next 12 months) for this project.

In parallel to 27553-2, there are other biometrics-related standards in development with security and privacy challenges. The EU has a strong position on privacy of personal data, and among that, information biometrics are seen as among the most sensitive ones. Based on GDPR and the standards developed in WG5 of SC27 (privacy standards, authentication assurance standards, and security evaluation standards), it is important to ensure that the standards developed for specific business/domain remain consistent with these principles, including high assurance approaches for security evaluation, and even more, that they rely on up-to-date privacy and security enhancing technologies.

Concerned ICT Standards and contribution to the related landscape

This fellowship is a follow-up activity to my previous fellowship funded under StandICT.eu Open Call 1. The current activity led to the development of the final phases of 27553-2 and 19792. In addition, the activity includes other on-going or anticipated projects related to biometrics, security and privacy. The master goal is to ensure security and privacy of sensitive data are better taken into account, to ensure consistency with the highest standards, and also taking in account recent progresses in privacy enhancing technologies. This will enable it to be aligned with the high requirements from the EU market, at least, and even to reach additional protection by technical design. Given the increased use cases and demands for biometrics, security requirements are also becoming higher, thus there are discussions for potentially updating other security evaluation standards (or creating new ones). There is thus an evolving need to ensure a high level of assurance and consistency among different approaches.

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

Impact on SMEs

The developed standards lead toward the development of EU-friendly solutions for biometrics-based services, employing strong privacy enhancing technologies, thus going further contractual and organisational requirements, to ensure privacy and security by design. Promoting the use of the newest privacy enhancing technologies is in particular very important as sharing or leaking biometric information without appropriate protection can be very critical. This will support innovation in the EU market and a common approach between the member states. It will also help the EU providers to be ahead of the competitors internationally.

Similarly for security evaluation, alignment and consistency and to take in account latest threats is required. This will impact the EU solution providers and vendors and capability to ensure the appropriate level of security and privacy protection in the EU.

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

Yes. I contributed to revising several existing standards related to biometrics, especially this fellowship that led to the development of the final phases of 27553-2 and 19792. In addition, based on feedback from the market, I suggested and explained the needs to revise the 19989 security evaluation framework, where the presence of additional EU experts will help to align with EU schemes. Revision of ISO/IEC 19989-1 (2020) Information security — Criteria and methodology for security evaluation of biometric systems - Part 1: Framework has been approved by SC27 in April 2024.

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

The fellowship was related to standards revisions projects where I contributed to commenting and providing technical inputs, but final publications are expected later this year.

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

The revision work of the concerned standards is in progress, and we expect to finalise the revisions of 27553-2 and 19792. The contributions on those projects are long term and on-going contributions, where I contribute to both content and leadership.

Online references related to the fellowship work

 www.iso.org/committee/45306.html

 www.iso.org/committee/313770.html

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

Build certification scheme for En17926 (refining ISO27701 in EU context) complying with art 42 GDPR



Matthieu Briottet
IT Consultant, TRAX
France

Sector

E-Privacy

Engaged SDOs, WGs and TCs



CEN-CLC/JTC 13 'Cybersecurity and Data Protection', Working Group 5 'Data Protection, Privacy and Identity Management'
ISO/IEC JTC 1/SC 27/WG 5 Identity management and privacy technologies

Role

Member

Addressed EU standardisation priorities and gaps

The assurance certification provided to stakeholders relies on the requirements that its mechanisms comply with, for instance, the requirements for certification bodies (accreditation), and the certification schemes to ensure consistency and repeatability. Once available, prEN 17926 will allow market stakeholders to greatly benefit from the high level of assurance offered by compliance to such requirements.

Indeed, stakeholders need to be assured about the solidity and consistency of conformity assessment processes in the privacy field: data controllers and processors, data subjects, and regulators. The proposed standard will specify the requirements needed for certification schemes to achieve that level of assurance regarding data processing operations against prEN 17926. Once the proposed standard is developed, it will be possible to propose it for approval as a certification criterion, as foreseen by GDPR article 42. Such a proposal could be made by an organisation willing to take the role of scheme owner and to propose it to the appropriate authorities for approval.

Concerned ICT Standards and contribution to the related landscape.

In order to apply its requirements in a European Context, CEN and CENELEC JTC 13 on 'Cybersecurity and Data Protection' is working on developing a new standard: prEN 17926.

My fellowship targets to provide PrEN 17926 with a certification scheme making it possible to propose it for approval as a certification criterion, as foreseen by GDPR article 42. The following ISO standards are used as reference documentation: ISO 27701, ISO 27001-1, and ISO 27006-2. In addition, ISO 17065 and ISO 17021 are cited as normative references in the JT013068. Finally, JT013068 is related to PrEN 17926 as its certification scheme candidate.

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

The expected impact of the project is to provide stakeholders with a certification as defined in article 42 of the GDPR, thus improving trust between actors in a context of PII processing. It will provide PII principals with a recognised benchmark for compliance to GDPR, helping to identify trusted stakeholders whenever PII processing is involved.

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

This project targets to provide PrEN 17926 with a certification scheme making possible to propose it for approval as a certification criterion, as foreseen by GDPR article 42.

As PrEN 17926 is relying on ISO 27701, itself under revision, we recommended reviewing PrEN 17926 as well so we can work directly with a stable version of it. A Work Item Proposal has hence been drafted and submitted to PrEN 17926's editor to this extent.

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

For the time being, a roadmap of the project (with an expected end for Q4 2026) and a draft version of the standard (WD JT013068 ndoc 324) have been documented and are still subject to comments (filed in a Disposition of Comments) to establish a working draft. This draft stage has de facto been prolonged by the necessary revision of PrEN1926 due to the revision of ISO 27701.been

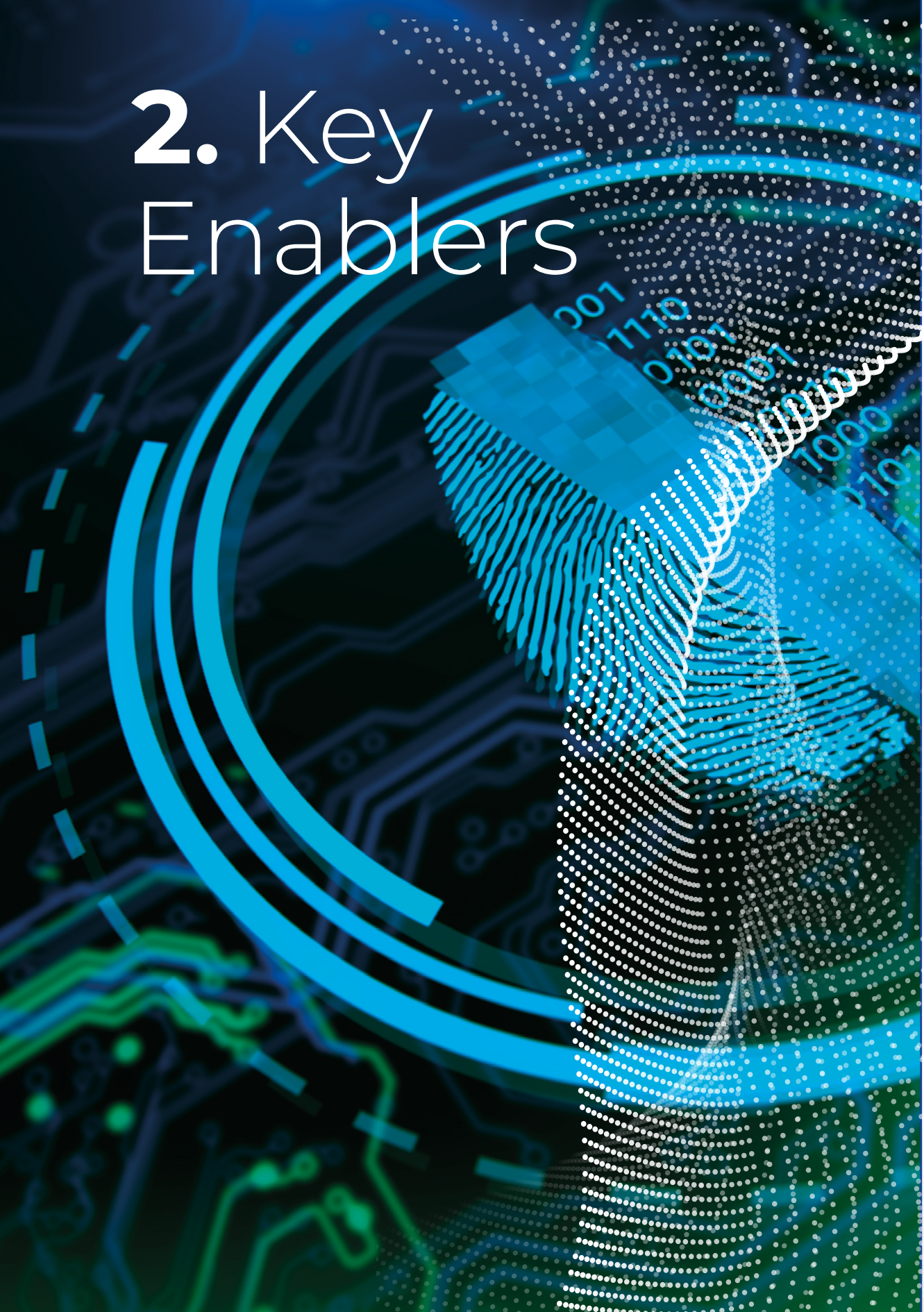
What future efforts or activities are still necessary for your area of application?

The first step is the final review of ISO 27701 and the subsequent review of PrEN 17926, to finish the Draft process. There will then be a need for scheme owner, in charge of proposing the certification scheme to the European Data Protection Board for approval as a valid certification criterion as foreseen in GDPR article 42.

Online references related to the fellowship work

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

2. Key Enablers



IEEE P7018 - Requirements for trustworthiness and security of pretrained AI generative models (LLM)



Andrea Basso

CTO, Synesthesia s.r.l.

Italy

Sector

Artificial Intelligence

Engaged SDOs, WGs and TCs



IEEE P7018 WG - Standard for Security and Trustworthiness Requirements in Generative Pretrained Artificial Intelligence (AI) Models

Role

Member

Addressed EU standardisation priorities and gaps

My fellowship tackles five priority areas. Firstly, it focuses on the fragmentation in AI Standards. Currently, there is a lack of standardised practices for the security and trustworthiness of AI generative models. This fragmentation hinders the development of a cohesive and interoperable AI landscape. The proposed standards address this gap by providing a unified framework that spans the entire lifecycle of AI models.

Secondly, it treats the privacy Concerns and GDPR Compliance. Privacy concerns are paramount in the European context, given the stringent GDPR regulations. The proposed standards tackle the challenge of privacy leakage by establishing guidelines for responsible data handling and anonymisation, ensuring compliance with existing and emerging data protection regulations.

Thirdly, it looks into Public Trust and Market Acceptance: Building public trust in AI technologies is essential for widespread market acceptance and adoption. The lack of clear standards contributes to scepticism and uncertainty among users. By defining criteria for transparency, interpretability, and explainability, the standards enhance the explainability of AI models, addressing the challenge of gaining public trust.

Fourthly, it covers aspects of Cross-Sectoral Integration: Different sectors in Europe are at different stages of AI adoption, leading to diverse AI practices. The proposed standards bridge this gap by offering a versatile framework applicable across sectors, ensuring that AI generative pretrained models adhere to consistent security and trustworthiness standards.

Finally, it considers Global Competitiveness: In the global race for AI dominance, Europe faces competition from other regions. Standardisation in AI not only fosters internal cohesion but also positions European industries competitively on the global stage. It ensures that AI innovations from Europe meet international standards, contributing to the region's influence in the global AI landscape.

Concerned ICT Standards and contribution to the related landscape

My fellowship contributes to the standardisation on trustworthiness and security of AI generative pretrained models to establish a robust framework that addresses the escalating concerns surrounding the security risks and privacy implications associated with the development, deployment, and utilisation of these advanced AI models. IEEE P7018, CEN CENELEC

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

Impact on Society

As AI generative models become increasingly sophisticated and pervasive in various applications, the potential risks they pose in terms of security breaches, privacy violations, and ethical concerns have grown significantly. The lack of a standardised approach to address these challenges has led to a fragmented landscape with varying levels of security and privacy practices across different models and applications. This inconsistency not only exposes users and organisations to potential vulnerabilities but also hampers the responsible and ethical development of AI technologies. The necessity for standardisation arises from the urgency to provide a comprehensive and unified framework that can guide developers, organisations, and policymakers in mitigating these risks. It aims to instil trust in the market and the users of AI systems and ensure that the technology is developed and deployed in a manner that aligns with ethical principles and regulatory requirements.

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

Yes, the standard is IEEE P7018. The proposed standardisation aims to propose a comprehensive framework that covers the entire lifecycle of generative AI models focusing in:

- ▶ Mitigating Security Risks: Define and categorise security risks associated with AI generative models.
- ▶ Privacy Protection: Develop guidelines for protecting user privacy by addressing issues related to data handling, anonymisation, and the responsible use of AI.
- ▶ Functional and Non-functional Requirements: Specify both functional and non-functional requirements to ensure security, reliability, and ethical behaviour.
- ▶ Evaluation Metrics: Introduce standardised metrics for evaluating the transparency, interpretability, and explainability of AI models.
- ▶ Guidance for Deployment: Provide guidelines for secure deployment practices,
- ▶ Regulatory Compliance: Align the framework with existing and emerging regulations to ensure that AI generative pretrained models comply with legal and ethical standards.

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

Yes, the resulting deliverable is the compliance framework that is built on the stakeholder requirements, a gap analysis as well as task force feedback.

Online references related to the fellowship work

 <https://standards.ieee.org/ieee/7018/11306/>

Building trustworthiness for artificial intelligence



Piercosma Bisconti Lucidi

Researcher in AI Ethics, Co-Founder of DEXAI – Artificial Ethics, Italian Interuniversity Consortium for Computer Science
Italy

Sector

Artificial Intelligence

Engaged SDOs, WGs and TCs



CEN-CENELEC JTC21 Artificial Intelligence WG4 Foundational and societal aspects

Role

Project leader and editor of the 'AI Trustworthiness Framework'

Addressed EU standardisation priorities and gaps

With this fellowship, I am addressing the standardisation of AI systems, with particular focus on the standardisation request of the EU Commission in relation to the AI Act. The grace period given to high-risk AI systems under the AI Act is 24 months, and CEN-CENELEC standardisation activities need to work at a fast pace in order to meet the deadline with standards ensuring AI Act practical implementation. This is an outstanding challenge I am currently addressing being the project leader of the overarching "AI Trustworthiness Framework". The development of this standard represents a priority in the AI standardisation landscape in order to provide companies, organisations, and SMEs with an entry point to the standards for AI in the EU, and delivering the high-level requirements that will ensure the protection of fundamental rights. The second challenge is the gaps between standards under development inside the CEN-CENELEC, and the complexity of their interplay. This issue might constitute an outstanding barrier for CEN-CENELEC standards toward a full coverage of the EU AI Act. In fact, some provisions might remain unaddressed, ultimately delaying or hindering the full application of the AI Act in the EU environment. The "AI Trustworthiness Framework" aims to fill these gaps by putting forth those requirements that remained unaddressed in order to cover the AI Act provisions, and examine the interplay between the different requirements of other standards, to understand if there are overlaps or contradictions that need to be addressed. Moreover, AI ethics is a field that is still highly qualitative and poorly systematic. I am contributing in the standardisation activities of AI Ethics to provide the EU environment with clear methodologies to address ethical challenges of AI systems.

Concerned ICT Standards and contribution to the related landscape

In my role as project leader and editor of the 'AI Trustworthiness Framework', I am guiding this crucial task group to establish an overarching standard. This standard is intended to serve as the industry entry point for the 10 items specified in the standardisation request. The concept of trustworthiness, central since the High-Level Expert Group on AI's White Paper 'Ethics guidelines for trustworthy AI', defines our approach. To ensure trustworthiness in Artificial Intelligence means that AI systems are capable of 'meeting stakeholders' expectations in a verifiable way'. In the EU context, this entails that AI

systems will respect and reflect EU values and fundamental rights. The objective of this task group is to support the AI standardisation request by providing guidance and requirements to stakeholders. This guidance will inform the use of standards identified in the Architecture of Standards. The project's aim is to develop a standard on the AI trustworthiness framework that ensures actionability for all stakeholders and sectors. Its goal is to bring consistency, comprehensiveness, and alignment to high-level horizontal requirements. To achieve this, the following objectives have been set:

1. To put forth high level horizontal requirements for AI systems.
2. We will work toward bringing consistency and harmonisation between the different standards developed under JTC21, to fill the current gaps in order to support the EU AI Act.
3. We will develop a contextualisation methodology to contextualise high-level horizontal requirements to specific domains of applications or stakeholders. This methodology will be a guidance on how to tailor the horizontal requirements to specific domains of applications that might require additional measures to ensure trustworthiness.

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

Impact on SMEs

Industries and SMEs in the EU are facilitated in adopting standards. One of the main barriers for standard adoption is the complexity of the standardisation processes. In order to claim conformity, multiple requirements coming from multiple standards should be met. The AI Trustworthiness Framework will serve as an entry point for industries and SMEs in order to facilitate this process, fostering conformity and facilitating industry competitiveness.

Impact on Society

Trustworthiness fosters social acceptance. One of the outstanding barriers in the deployment of innovative technologies is social acceptance. This barrier damages both the economic benefits and the social benefits of designing innovative AI systems. The AI Trustworthiness Framework will reinforce social trust in AI systems, by providing companies, consumers and ultimately citizens with a clear understanding of the fundamental requirements for trustworthy AI.

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

Yes, My project successfully proposed a new standard: the AI Trustworthiness Framework passed the ballot under the duration of my project.

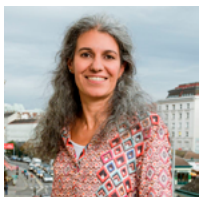
Have the standardisation activities in your project led to specific deliverables?

Yes, I have led the effort to draft two key deliverables: the "AI trustworthiness framework" and the "AI Ethics Framework", which will be the basis for future standards.

Online references related to the fellowship work

 https://standards.cencenelec.eu/dyn/www/f?p=205:7:0:::FSP_ORG_ID:3125029&cs=1CDB8428250A957109C1F6B857D56B8A6

Accuracy and evaluation methods in the context of NLP systems



Rania Wazir

Co-founder and CTO, leiwand AI gmbh
Austria

Sector

Artificial Intelligence

Engaged SDOs, WGs and TCs



ISO/IEC JTC1/SC42 JWG5 “Natural language processing” (Joint WG with ISO/TC 37); CEN/CENELEC JTC21 WG3 “Engineering aspects”

Role

Project Editor of ISO/IEC 23282 “Evaluation methods for accurate natural language processing systems”

Addressed EU standardisation priorities and gaps

The main focus of the activity lies in preparation of the standard ISO/IEC 23282 “Evaluation methods for accurate natural language processing systems”.

The related gaps concerning previous work within CEN/CLC had identified that existing international standards projects (such as ISO/IEC 23053 and ISO/IEC TS 4213) cover evaluation metrics only for AI systems using classification or regression. Many NLP systems do not fall neatly into those categories, and this standard is intended to fill in the gap. The project will use the framework of NLP tasks being developed in a separate CEN/CLC technical report, to map tasks to appropriate evaluation methods.

The fellowship’s priority is related to the European Commission’s standardisation request to CEN/CLC includes a request for “accuracy” standards (SR6), where “accuracy” is understood as a measure of how well the AI system performs its given task. Timely development of a standard on NLP evaluation methods is thus a priority both at EU level, and at CEN/CLC level. Given the breadth of possible tasks that fall into the NLP domain and the wide range of possible evaluation methods, the priority will be on producing a standard that provides guidance mapping tasks to appropriate evaluation methods, together with any necessary specifications on implementations to make evaluations reproducible.

In this sense, the challenges concerning NLP systems, and in particular large language models and chatbots, have become ubiquitous. The very wide range of possible tasks means that the standard has to pull in expertise from a variety of experts, and finding a common language and approach is a significant hurdle. Furthermore, the fast pace of development in the NLP field means that the standardisation process has to keep up with a fast-evolving state of the art, and this is a mode of operation that is often antithetical to the slow, deliberative approach of traditional standardisation efforts.

Concerned ICT Standards and contribution to the related landscape

The main focus of the fellowship lies in preparation of an ISO/IEC Standard on evaluation of AI systems based on natural language processing (NLP): ISO/IEC 23282 “Evaluation methods for accurate natural language processing systems”. This work is hosted in ISO/IEC JTC1/SC42 JWG5, and my role is Project Editor. In parallel, I will do additional ICT contributions as:

- ▷ Project editor of ISO/IEC 12792 “Transparency taxonomy of AI systems”
- ▷ Contributor to ISO/IEC TR 23281 “Overview of AI tasks and functionalities related to natural language processing”
- ▷ Contributor to ISO/IEC 12791 “Treatment of unwanted bias in classification and regression machine learning tasks”
- ▷ Contributor to CEN/CLC JTC21 project “AI trustworthiness framework”

I will also be a contributing expert to the newly approved CEN/CLC JTC21 project on “Managing bias”.

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

Impact on SMEs

As co-founder of an AI start-up, and also as consortium partner in research projects involving other SMEs, I am very aware of the importance of clear and simple guidelines that can help smaller organisations comply with regulations. The lack of evaluation methods beyond classification and regression in the existing standards corpus renders compliance with the AI Act difficult for producers of NLP systems, especially for SMEs that do not have the resources to identify the appropriate methods through extensive research themselves. This project should therefore have a positive impact on the ability of SMEs to produce and assess quality NLP systems, and should simplify compliance with the AI Act requirements. It should also have a positive impact on auditors, regulators, and users, by providing them with the means to understand NLP system tests, and make informed decisions on the performance and applicability of such systems.

Impact on Society

The NLP evaluation project is one part of the European standardisation effort to fulfil the European Commission’s standardisation request relating to accuracy of high risk AI systems (SR 6). It provides definitions and requirements for task-specific evaluation metrics, and gives guidance on how and when the metrics should be used.

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

Yes. The main focus of the activity lies in the development of an ISO/IEC Standard on evaluation of AI systems based on natural language processing (NLP): ISO/IEC 23282 “Evaluation methods for accurate natural language processing systems”. This work is hosted in ISO/IEC JTC1/SC42 JWG5, and my role is Project Editor.

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

Yes, as the project editor I contribute to preparing a lot of relevant documents for the standardisation process (committee drafts, DIS Ballot).

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

This standardisation project was officially approved as a new standardisation project in October 2023, and was actually approved for parallel development by ISO/IEC and CEN/CLC with ISO lead, under the Vienna Agreement. Delays on the ISO/IEC JTC1/SC42 secretariat side led to a late project start, in late January 2024. The project is now in drafting mode, and collecting contributions from experts.

Online references related to the fellowship work

 <https://www.iso.org/standard/87387.html>

Progressing the “Competence Requirements for AI Ethicists Professionals” to the Working Draft stage



Alessio Tartaro

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Italy*

Sector

Artificial Intelligence

Engaged SDOs, WGs and TCs



CEN-CENELEC JTC 21 Artificial intelligence WG 4 - Foundational and social aspects

Role

Project leader

Addressed EU standardisation priorities and gaps

The landscape of technical standards for artificial intelligence (AI) is shifting. Once focused solely on technical specifications, standards are now evolving to encompass ethical and societal issues and governance processes, reflecting the growing recognition of AI's social impact and ethical implications.

While existing standards outline processes for considering ethical and social concerns in AI development, a critical gap remains: a lack of defined competency requirements for the individuals tasked with implementing these processes across different organisations.

My fellowship aims to bridge this gap by establishing a framework for AI ethicist competencies. AI ethicists are an emerging role within the AI ecosystem, responsible for overseeing and integrating ethical considerations throughout the AI development lifecycle.

The primary challenge lies in effectively integrating ethical considerations within a traditionally technical environment. Additionally, the relatively recent inclusion of ethics in standardisation efforts has led to a knowledge gap within technical committees, sometimes resulting in resistance to these topics.

The development of trustworthy AI systems is a key policy priority in Europe, with soft law instruments like the Ethics Guidelines for Trustworthy AI and emerging regulations such as the AI Act promoting AI systems that respect European values and fundamental rights.

Clearly defined competencies for AI ethicists offer a powerful tool to achieve this European objective. On the one hand, defined competencies equip AI ethicists with the necessary knowledge and skills to navigate these complex issues. On the other hand, such definitions create trust in the market for these professionals, empowering them to uphold European values and fundamental rights throughout all stages of AI development and use.

Concerned ICT Standards and contribution to the related landscape

My fellowship project recognises AI systems as inherently sociotechnical, meaning they involve a complex interplay between human and technical components. To ensure optimal functioning, specifications are necessary for both. Standardisation traditionally focuses on the technical side, and this project fills the gap by addressing the human aspect.

Standardising the human element is crucial for the ICT Standards landscape. It fosters seamless integration of both technical and human components within AI sociotechnical systems. More specifically, my project defines the competency requirements for professionals in AI ethics. These professionals play a critical role in analysing and addressing the ethical and social concerns that arise during the design, development, and use of AI systems.

By incorporating the human element, this project broadens the scope of ICT Standards beyond purely technical matters. This expansion is essential in today's world, where information and communication technologies, particularly AI systems, significantly impact our lives, values, and fundamental rights. A broader view within ICT Standards allows for more comprehensive integration of complex technological ecosystems. Focusing solely on technical specifications is inadequate for building trust in AI systems.

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

Impact on SMEs

This fellowship directly impacts SMEs within the European AI landscape. Its focus on defining AI ethicist competencies aligns with the European push for Trustworthy AI. For SMEs, the benefits are twofold:

1. Clear Reference Point: The established standard provides SMEs with a clear framework for evaluating AI ethicist competency. This is crucial, especially for companies without the resources to hire a full-time AI ethicist.
2. Informed Decision-Making: When seeking external consultations on ethical and social implications of their AI systems, SMEs can leverage the standard as a reference point. It empowers them to make informed decisions when selecting qualified consultants, ensuring their AI development aligns with European ethical principles.

By establishing a competency framework, this project empowers SMEs to actively participate in the responsible development and deployment of AI within the European market.

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

Yes. My project involves developing the working draft of the work item JT021019 - prEN XXX - "Competence Requirements for AI Ethicists Professionals" in CEN-CENELEC JTC21 WG4.


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

Yes, I am leading the project writing "Competence Requirements for AI Ethicists Professionals" resulting in a Working Draft for CIB ballot.

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

As project editor, I am coordinating the activities for drafting the working draft to be sent for the ballot. I also participate as a technical expert providing contributions to be included in the working draft, and I aim to have the presentation of the Working Draft for the CIB ballot ready in August 2024.

Online references related to the fellowship work

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

AI-CoE: Artificial Intelligence for Business powered by Center of Excellence. TR standard



Javier Peris

ICT Senior Advisor, Consultant and Trainer, Business, Technology & Best Practices, S.L. Spain

Sector

Artificial Intelligence

Engaged SDOs, WGs and TCs



UNE ICT mirror subcommittees for: ISO/IEC JTC 1 (ICT) SC40 (ICT Management) and ISO JTC1 SC42 (Artificial Intelligence)

Role

Expert

Addressed EU standardisation priorities and gaps

The main priority of my fellowship focuses on helping organisations to drive innovation and technological transformation using the Centre of Excellence (CoE) as the best management mechanism in a context of a shortage of professional profiles with expertise in Artificial Intelligence and other disruptive technologies.

There are barriers to AI expansion sharing knowledge across projects and areas in organisations. Successful AI projects have a strong unexpected over-demand for knowledge sharing, which pulls them to failure in the next project. Also, AI projects are scattered and do not follow a common pattern. Each initiative has to reinvent how to work.

With regards to centres of excellence, the concept of sharing expertise and success stories through a Center of Excellence is unknown and not on the agenda of executives. A poorly structured and managed Center of Excellence can degenerate into bureaucracy, costs, and loss of value.

Concerned ICT Standards and contribution to the related landscape

In the framework of this fellowship, I am working on the creation of a new standard that facilitates AI adoption. This new standard on CoE in AI will enable companies to improve in two key areas: to early expand AI utilisation and to reduce the high risk of failure of AI initiatives. Today, there are no international standards that address how to apply AI successfully across an organisation's multiple activities. This CoE on AI adoption will be useful specifically for small organisations, but also for large corporations.

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

Impact on SMEs

European small organisations do not have the experts or economic resources to hire specialised AI consultants, so they must postpone the application of AI in their businesses. This generates a new delay in their innovation gap. The main opportunity for SMEs is their

incorporation to a future CoE-collective, sectoral cluster type, laboratory of a City Hall and other potential movements of knowledge collectivisation.

Therefore, the goal of this fellowship is the promotion of a set of standards focused on identifying best practices for the success of CoE in AI (state-of-the-art Technical Report) and for the subsequent definition of the CoE model to be used (work model Technical Specification).

My vision is that creating a standard on how to constitute and manage an AI Center of Excellence enables European small companies and sectors to have a higher success rate in AI innovation initiatives, making them easier to realise and reducing risk.

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

Yes, I contribute to the creation of a new standard that facilitates AI adoption via the use of the Centre of Excellence management model to centralise and share expertise. This new standard does not have a name up to now, but the title could be: "Artificial Intelligence for Business adoption powered by Center of Excellence Standard".

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

Yes, I drafted a technical report on the state of the art of Artificial Intelligence driven by CoE.

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

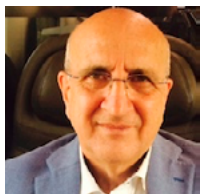
The initiative is positively following the work plan set out in the planning, the goal is to have the report ready for approval to the subcommittee in August 2024.

Online references related to the fellowship work

 www.en.une.org/encuentra-tu-norma/comites-tecnicos-de-normalizacion/comite?c=CTN+71/SC+40

 www.une.org/encuentra-tu-norma/comites-tecnicos-de-normalizacion/comite?c=CTN+71/SC+42

Completion of TR “Data Governance & Quality for AI in EU context” including Quality in use



Domenico Natale
Independent expert
Italy

Sector

Artificial Intelligence

Engaged SDOs, WGs and TCs



CEN/CENELEC JTC21 AI WG3 Engineering Aspects
CEN/CENELEC JTC21 AI WG2 Operational aspects
ISO/IEC SC7 WG6 Product quality
ISO/IEC SC42 AI WG3 Trustworthiness
ISO/IEC SC42 AI WG2 Data

Role

Expert member

Addressed EU standardisation priorities and gaps

My fellowship is related to the main gap in ISO that was addressed developing the standard ISO/IEC 25012: 2008 as editor, because the standard on data quality didn't exist. In 2003 during the interim meeting SC7/WG6 in Lannion, France, the realisation of the first ISO standard started to define the data quality model. In 2008, after 5 years of intensive work, the ISO/IEC 25012 “Data quality model” was approved unanimously and published, composed of 15 quality characteristics. The model is still now recognised by the international community and in Italy included in some public documents. In 2015 was published in addition the complimentary ISO/IEC 25024 “Measurement of data quality”.

One of the key priorities of my current work is to share this knowledge on data with Italian authorities (AgID-Agency for Italian digitalisation). In 2013 the Agency AgID recommended applying the standard 25012 to the big database for national interest of public administration. The standard is included in the Italian Plan of digitalisation. Moving the activity from national goal to international ones (ISO and CEN CENELEC) the standard 25012 has been proposed (and accepted) to ISO/IEC 5259-2 “Data quality measures” and also in the activities of CEN CENELEC JTC21 for AI.

A particular challenge now is also dissemination and adoption of the principles of quality in use (ISO/IEC 25019:2023), to monitor the post-market product according to the recent regulation of EU AI Act, giving attention to acceptance by stakeholders. The mitigation of risks is defined for environment, social impact, health, human life, economics, food, water.

Considering the publication of the AI Act, in the next months a challenge will be given to supporting the application of the EU Regulation with a complete vision of existing standards, giving also some orientations to individuate possible new standardisation requests where needed.

Concerned ICT Standards and contribution to the related landscape

This fellowship supports my contributions to the technical report “Data governance and quality for AI in the European context”, following standardisation requests. This report

provides an overview on AI standards developed in SC42 and possibly adopted in CEN-CENELEC/JTC21, collecting documents in the European context and in the ISO environment offering an overview to users of agencies, enterprises, developers, universities, researchers, focus groups, and other stakeholders. It addresses particularly data governance, data quality, and elements for data and datasets quality properties for training AI systems.

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

Impact on SMEs and Society

Important and relevant standards on AI quoted and described in the TR are essential to help the Italian and European societies to start the application of AI Act regulation. The time is precious, because a lot of enterprises are already developing AI systems, applying when possible, the obligations of new regulations. The interest in enterprises to try the self-assessment, before the possibility of requesting quality certification (not ready) from third parties relating to processes and products, is considering priority.

Hence, the technical report that I work on will:

- ▶ Incentivise the data production for machine learning reducing the import of data from outside Europe
- ▶ Disseminate the ethics of use of data
- ▶ Reinforce the human centric management of AI Europe needs;
- ▶ Monitor adequately the growing AI applications
- ▶ Help the organisations and authorities for control and governance

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

Not directly. The produced technical report underlined some different approaches producing standards, with risks of duplications between CEN WGs. Also, my participation in different SDOs and WGs enables me to track terms and methods of work. The state of art at the moment suggest to define a guideline to collect a common language in the European countries relating to:

- ▶ Support quality engineering, such as governance, management, processes, products, methods, techniques, measurements, measures;
- ▶ Connect quality engineering to life cycle processes; *
- ▶ Relationship between quality engineering, software engineering, systems engineering, data engineering, testing, quality assurance;
- ▶ Collection of several International and European standards offering an integrated vision, harmonised with the AI Act

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

Yes, as mentioned above, I drafted a technical report on “Data governance and quality for AI in the European context”.

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

In these months the AI standards and regulations landscape evolves a lot, impacting all ongoing AI-related projects, such as my fellowship project. In the next steps, my plan is to publish information about the TR “Data Governance and quality for AI in the European context, because I think that could be useful for European SMEs so that they can acquire a global perspective about Data Governance. I also will spread information about already existing standards supporting EU AI ACT.

Online references related to the fellowship work

 <https://www.iso.org/committee/45086.html>

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

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

ITU-T FG-TBFxG Testbeds Federations Reference Model APIs Invocations Framework & Security Framework



Ranganai Chaparadza

*Senior Advanced ICT Technologies Consultant and
Standardisation Expert, Altran Capgemini
Germany*

Sector

5G and beyond, 6G

Engaged SDOs, WGs and TCs



ITU-T Focus Group FG-TBFxG on on Testbeds Federations for 5G and Beyond

ETSI TC Core Network and Interoperability Testing (INT)

ETSI Autonomic Management and Control (AMC)

ETSI Intelligence for Self-Managed Fixed & Mobile Integrated Networks (AFI)

NIST Multi-Domain Knowledge Planes for Service Federation for 5G & Beyond Public Working Group (MDKP-PWG)

IEEE INGR Future Networks Initiative Systems Optimisation WG

IEEE Testbeds WG

IEEE Standardisation Building Blocks (SBB) WG

Role

Expert member

Addressed EU standardisation priorities and gaps

The targeted Technical Specification Standard that describes the APIs Invocations Framework for clarifying how Generic APIs defined and specified in ITU-T Recommendation Q.4068 should invoke Testbed-specific specialised APIs during Testbeds Federation Operation and Usage has the following impact: The work helps foster effectively some testing activities on 5G and 6G in Europe and globally that help provide for the acceleration of the maturity of 5G and 6G standards, Use cases and technologies through the use of Testbeds Federations. The work also helps stimulate the creation of standards and APIs for the associated ecosystem on Testbeds Federations for 5G and Beyond (including “Testbed as Service concept”, Business Models and Monetisation potential for Testbeds). The following are examples on perspectives that justify the need for Testbeds Federations:

The recent technological developments require more realistic tests and new use cases to be validated in real conditions (testbeds become more important as never).

There is a need for testbed federation and interconnection between testbeds – Reference Model and relevant APIs are needed.

Vertical industry needs to experiment and pilot their “5G enabled” business case before moving to commercial.

There is a need to standardise a generic 5G and beyond application testing and validation framework which validates the vertical application in a systematic manner under different 5G technology choices.

Concerned ICT Standards and contribution to the related landscape

With this fellowship, I continue contributing to Standards for Testbeds Federations for 5G and Beyond Landscape. Industry needs to experiment and pilot their “5G enabled” business case before moving to commercial. The ITU-T Focus Group FG-TBFXG collaborates with SDOs/Fora, Research Communities, Researchers on IMT-2020 and beyond, Industry Users of Testbeds, Testbeds Suppliers for IMT-2020 Testbeds and other Testbeds, CSPs, Network Operators, Infrastructure Vendors/Suppliers for ICT and Verticals, Open Source & Open Hardware Projects, Regulators.

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

Impact on SMEs

New Business Models for Testbeds Owners or Suppliers shall emerge as derived from the Testbeds Federations Reference Model (ITU-T Recommendation Q.4068) and associated APIs, such as “Testbed-as-a Service” (TaaS) Business Model.

The targeted Standard (ITU-T FG-TBFXG-TS-D3.1) that describes the APIs Invocations Framework for clarifying how Generic APIs defined and specified in Recommendation Q.4068 should invoke Testbed-specific specialised APIs during Testbeds Federation Operation and Usage has the following impact: The work helps foster effectively some testing activities on 5G and 6G in Europe and globally that help provide for the acceleration of the maturity of 5G and 6G standards, Use cases and technologies through the use of Testbeds Federations. The work also helps stimulate the creation of standards and APIs for the associated ecosystem on Testbeds Federations for 5G and Beyond (including “Testbed as Service concept”, Business Models and Monetisation potential for Testbeds).

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

Yes, within my ITU-T working group, we focus on developing a new standard; ITU-T FG-TBFXG-TS-D3.1 Evolution of the Testbeds Federations Reference Model.

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

Yes, I am the editor of the technical specification ITU-T FG-TBFXG-TS-D3.1 Evolution of the Testbeds Federations Reference Model.

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

The ITU-T Focus Group FG TBFXG held their meeting 10-12 April to advance all the deliverables towards completion. The work has led to the pre-publication of the targeted standard as output of the ITU-T Focus Group FG-TBFXG. There may be some editorial aspects that may be spotted to need fixing before final publication and this expert as Rapporteur shall support in that process. The Standard document (ITU-T FG-TBFXG-TS-D3.1 Evolution of the Testbeds Federations Reference Model) that is now in pre-publication state is available online³.

Also, I continue supporting the liaisons established between FG-TBFXG and other organisations such as IEEE INGR Future Networks Testbeds WG and SysOpt WG, to disseminate the FG-TBFXG deliverables once finalised and published by ITU-T soon, so as to get the ideas advanced by the deliverables incorporated in their roadmaps.

3 <https://www.itu.int/en/ITU-T/focusgroups/tbfxg/Documents/Deliverables/FG-TBFXG-TS-D3.1.docx>
<https://www.etsi.org/committee/1401-int>

Online references related to the fellowship work

 www.itu.int/en/ITU-T/focusgroups/tbfxg/Pages/default.aspx

 <https://futurenetworks.ieee.org/roadmap/systems-optimisation-working-group?highlight=WyJjaGFvdWl1XQ==>

 www.nist.gov/programs-projects/multi-domain-knowledge-planes-service-federation-5g-beyond-public-working-group

■ ITU-T SG13 2024



Alojz Hudobivnik
AH.TS Alojz Hudobivnik s.p.
Slovenia

Sector

5G and beyond, 6G

Engaged SDOs, WGs and TCs



ITU-T SG13 - Future networks and emerging network technologies ;
WP1/13 "IMT-2020 and Beyond: Networks & Systems"

Role

ITU-T SG13 WP1 vice-chair

Addressed EU standardisation priorities and gaps

In this fellowship I tackle IMT-2020 (5G) and beyond network aspects: Studies on the requirements and capabilities for networks based on the service scenarios of IMT-2020 and beyond. This includes development of recommendations on the framework and architecture design including also network-related aspects of reliability, quality of service (QoS) and security. Furthermore, it includes interworking with current networks, including IMT-Advanced, etc. Standardisation work continues with the integration of new technologies, new insights, and new requirements of different verticals. It is very important that EU science, industry, and also users are well represented and engaged in this process.

Concerned ICT Standards and contribution to the related landscape

This fellowship supports my role as the vice-chair of ITU-T SG13 - Future networks and emerging network technologies. During this fellowship period, we have conducted a lot of varied efforts to progress with the ongoing standardisation projects.

I attended the ITU-T SG13 meeting (March 2024, ITU Office Geneva), where I chaired the SG13 WP1 meeting plenary. I also attended JCA-IMT 2020 and beyond meetings to synchronise further steps for improving IMT-2020 and beyond the roadmap.

Now, I have several ongoing responsibilities:

- ▶ Editor of Revision 4 of Supplement 59 to ITU-T Y-series Recommendations ITU-T Y.3100-series "IMT-2020 and beyond standardisation roadmap".
- ▶ Review of Y.3073 Amd 1 "Framework for service function chaining in information-centric networking".
- ▶ Commenting contribution related to Y.ICN-INP "Information-centric networking in networks beyond IMT-2020: Requirements and capabilities of node to support in-network processing", Y.ICN-ILE "Requirements and functional framework of Information Centric Networking to support immersive live experience services", Y.ICN-ML "Information centric networking in networks beyond IMT-2020: Requirements and functional framework enhancement to support machine learning". Y.ICN-Det "Information centric networking in networks beyond IMT-2020: Requirements and functional framework enhancement to support deterministic communication services" to find the best way to improve the text by the editors.

In addition I am also an SG13 mentor, and I offer a regular newcomer session presentation.

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

Impact on SMEs

Well defined and globally standardised 5G ecosystem is important for operators and all suppliers of SW and HW components which gradually develops. Additionally, the EU Rolling Plan for ICT (2024) clearly defines the importance of 5G infrastructure for verticals and defines needed standardisation actions. I hope I can contribute with my work to fulfil these goals.

Impact on Society

Recently, delegates propose more than 40 new proposals for new standards at each meeting due to the rapid development of technology and application in various verticals. Proposals are subject to expert consideration and I will personally support all proposals that are crucial for Europe at the moment and where Europe members have the content of good practice to be included in the emerging standard.

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

Yes, I contribute to developing new standards, including:

- ▶ Y.3073 Amd 1 “Framework for service function chaining in information-centric networking”
- ▶ Y.ICN-INP “Information-centric networking in networks beyond IMT-2020: Requirements and capabilities of node to support in-network processing”
- ▶ Y.ICN-ILE “Requirements and functional framework of Information Centric Networking to support immersive live experience services”
- ▶ Y.ICN-ML “Information centric networking in networks beyond IMT-2020: Requirements and functional framework enhancement to support machine learning”
- ▶ Y.ICN-Det “Information centric networking in networks beyond IMT-2020: Requirements and functional framework enhancement to support deterministic communication services”

In addition, I support the revision 4 of Supplement 59 to ITU-T Y-series Recommendations ITU-T Y.3100-series “IMT-2020 and beyond standardisation roadmap”.

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

Yes, I contribute drafting, revising and commenting to standardisation work of ITU-T Y3100 series.

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

Revision 4 of Supplement 59 to ITU-T Y-series Recommendations ITU-T Y.3100-series was opened as NWI at 3/2024 Meeting based on my contribution. I am now the editor and the plan is to finalise the document by the July 2024 meeting. Y.3073 Amd 1 was finalised and consented at March 15, 2024 Meeting and is now in Members approval procedure.

Y.ICN-ILE, Y.ICN-ML and Y.ICN-Det working documents were revised at 3/2024 Meeting and are candidates for decision at July 2024 meeting.

Online references related to the fellowship work

📎 <https://www.itu.int/en/ITU-T/studygroups/2022-2024/13/Pages/default.aspx>

📎 <https://www.itu.int/rec/T-REC-Y.3100/en>

IoT Semantic Interoperability for stress management, good health and well-being



Amelie Gyrard

Principal Research & Innovation Consultant, Trialog France

Sector

Internet of Things

Engaged SDOs, WGs and TCs



ISO SC41 IoT and Digital Twin
ISO TC215 Health Informatics

Role

Member

Addressed EU standardisation priorities and gaps

With this fellowship, I contribute, as an expert, to the standardisation of IoT Interoperability by ensuring integration of SAREF: SAREF-Core, SAREF4EHAW (eHealth /Ageing-well) and SARE4WEAR (SAREF for wearables) and other European contributions into ISO SC41 IoT and Digital Twin: ISO SC 41 – NWIP on IoT for Stress Management, Good health & Well-being for TC 215.

Concerned ICT Standards and contribution to the related landscape

The objective of this fellowship is to include European contributions on viable methodologies on semantic interoperability in ISO standards: ISO SC41 IoT and Digital Twin, with a focus on practical use cases in the domains of health/well-being. As a contributing expert, I have sent my contributions to ISO SC 41 – NWIP on IoT for Stress Management, Good health & Well-being for TC 215. It is a new standard focusing on stress management.

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

These new standards on IoT Stress will improve well-being by monitoring health parameters using IoT technology and wellness devices. It supports the creation of a semantic Repository which is a counterpart to the data space repository.

More generally, standardisation facilitates the interoperability, compatibility, reliability, security and efficiency of operations on a global scale among different technical solutions, stimulating industry innovation and providing greater clarity to technology evolution.

Whereas, interoperability between IoT networks operated by different companies along the value chain opens up opportunities to address EU Policy objectives, e.g. greater resource efficiency for a more circular economy, sustainable and responsible supply chains through transparency and traceability, and others.

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 within ISO SC41 IoT and Digital Twin: ISO SC 41 – NWIP on IoT for Stress Management, Good health & Well-being for TC 215.

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

Yes, I have contributed to drafting practical use cases for the NWIP.

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

This standard is still in process following the ISO standards adaptation methods.

Online references related to the fellowship work

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

 https://www.iec.ch/dyn/www/f?p=103:30:514393920981555:::FSP_ORG_ID,FSP_LANG_ID:20486,25

CrowdWireless++: Further Promoting Crowd Wireless Energy Sharing



Theofanis Raptis

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Italy*

Sector

Internet of Things

Engaged SDOs, WGs and TCs



**ITU-T Study Group 20 IoT and smart cities and communities
Question 5 Study of emerging digital technologies, terminology
and definitions**

Role

ITU-T Work Item Lead Editor Qi standard, Wireless PowerShare

Addressed EU standardisation priorities and gaps

The aim of the analysis within ITU is to identify existing gaps and market needs in the area of P2P crowd charging systems. Special focus has been given to smart city vertical areas, as well as technological enablers such as battery ageing mitigation, social information management, standardised prototyping.

Concerned ICT Standards and contribution to the related landscape

My current fellowship is supporting the development of the ongoing work item YSTR. P2P-CC in SG20 of ITU-T. A P2P crowd charging system is a distributed system comprising ICT infrastructure provided by the general public (e.g., smartphones). The distributed resources of a P2P crowd charging system operate in a collaborative manner driven to perform energy sharing tasks by using their built-in power transfer modules. This work item is conducting a review of and providing an analysis of the current state of P2P crowd charging systems in terms of currently available technological solutions, ongoing research, and recent and ongoing standardisation activities in this area.

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

In light of the emerging market needs and business opportunities, CrowdWireless++ aspires to successfully investigate and penetrate the market needs through the provision of a comprehensive technology framework that leverages wireless power enablers and crowd related requirements to capture the energy vibe of smart cities and provide insights for the implementation of P2P wireless crowd charging. For the first time in the standardisation state of the art and the related discussions, this fellowship work introduces the vision of combining diverse technological enablers in smart cities for providing a holistic approach for sustainable wireless crowd charging. CrowdWireless++ presents a carefully positioned taxonomy of the existing representative use cases, and it defines a model which takes into account not only the wireless power transfer specifics, but also the battery health parameters

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

No.

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

Yes, I have contributed to a technical report: YSTR.P2P-CC: Current state of P2P crowd charging platforms and corresponding market needs:

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

My fellowship will deliver a final deliverable that will eventually lead to the successful conclusion of the Work Item, which is expected to take place some months after the conclusion of my fellowship. The next SG20 meeting which will be the crucial point of the Work Item's discussion and consolidation will take place this July, 2024 in Geneva, Switzerland.

Online references related to the fellowship work

 <https://www.itu.int/en/ITU-T/studygroups/2022-2024/20/Pages/default.aspx>

■ Radio regulations for IoT and DPP



Josef Preishuber-Pflügl
Founder and CEO, innobir e.U.
Austria

Sector

Internet of Things

Engaged SDOs, WGs and TCs



ETSI ERM TG34 "RFID"
CEPT ECC WG FM SRD/MG "Short Range Device Maintenance Group".
ETSI ERM "EMC and Radio Spectrum Matters"
ETSI WG FM "Frequency Management"

Role

Chair ETSI ERM TG34 and expert member in the other groups

Addressed EU standardisation priorities and gaps

This work is addressing the demand of harmonised standards for radio regulations certification. In particular it is addressing RFID in the UHF frequency bands 865-868 and 915-921 MHz. The priorities are to follow the new requirements of the European Commission in radio device tests. A particular priority is here on receiver testing. The challenge is to follow the new requirements, to follow the development of measurement devices. The latter is very important as certified test labs have to maintain calibrated test equipment. Test equipment used when the first version of standards were developed 20+ years ago can no longer be used. As in particular RF test equipment changed a lot over time, it is in particular important that tests are updated accordingly. While the work on EN 302 208 is primarily addressing the topics coming from the European Commission, the work on TR 103 997 is addressing the change in test equipment.

Additionally, the work in CEPT has to be followed and inputs have to be provided. This happens primarily on SRD/MG "Short Range Device Maintenance Group" level, however, also its parent committee WG FM "Working Group Frequency Management" and up to the highest level ECC "Electronic Communications Committee".

Concerned ICT Standards and contribution to the related landscape

EN 302 208 "Radio Frequency Identification Equipment operating in the band 865 MHz to 868 MHz with power levels up to 2 W and in the band 915 MHz to 921 MHz with power levels up to 4 W; Harmonised Standard for access to radio spectrum" is addressing the demand of harmonised standards for radio regulations certification and the new requirements of the European Commission in radio device tests. A particular priority is here on receiver testing.

TR 103 997 "RFID, Measurement methods for transmitting spectrum using modern spectrum analysers" is very important as certified test labs have to maintain calibrated test equipment. Test equipment used when the first version of standards were developed 20+ years ago can no longer be used. RF test equipment has changed a lot over time, it is in particular important that tests are updated accordingly.

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

Impact on SMEs

SMEs are major contributors in the RFID industry, contributing to in particular tags, readers and system integration. All of them require harmonised standards. Therefore, the work and content of EN 302 208 and TR 103 997 are very important to them.

Impact on Society

RFID (UHF RFID, RAIN RFID) are a major used technology for the supply chain and production to reduce overproduction and waste. Furthermore, it is a technology for the Digital Product Passport, which is strongly supported by the European Commission for sustainable product regulations.

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

Yes, with this fellowship, I address the development of a revised standard for ETSI EN 302 208 and a new standard ETSI TR 103 997.

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

Yes, I have contributed to a technical report.

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

This new revision of ETSI EN 302 208 is currently under development, whereas the work has been started already under the previous ETSI ERM TC34 chair, but is not continued with me being the chair of ETSI ERM TC34.

Online references related to the fellowship work

 <https://portal.etsi.org/TB-SiteMap/ERM/ERM-ToR/ERMtg34-ToR>

Ultra-Low Power Ambient IoT Devices in 5G-Advanced



Sebastian Wagner

Standardisation Engineer, EURECOM
France

Sector

Internet of Things

Engaged SDOs, WGs and TCs



3GPP Technical Specification Group Radio Access Network (TSG RAN), RAN WG1 (RAN1)

Role

Expert member

Addressed EU standardisation priorities and gaps

The targeted ICT standard is 3GPP 5G-Advanced Rel-19. Since the introduction of 5G with Rel-15 many improvements have been made in Rel-16/17/18 especially in enhancing the support of low-cost low-power devices like sensors and wearables for IoT use cases, e.g. reduced capability devices (RedCap) or wake-up radio. However, additional enhancements are necessary to enable new use cases to support ultra-low-power/complexity devices.

The NetWorld2020 report states that one of the seven use cases that embody the wireless challenges ahead is “*Ultra-low Power IoT*”. Most notably, energy efficiency has to be increased by more than 70% in the medium-term 5G evolution. The NetWorldEurope report describes the potential positive impact on ICT sustainability of Ambient IoT devices:

“Energy harvesting from the environment or energy induced on demand from outside to wake up user equipment (UE) for a specific task, has been demonstrated and could lead the way to (near)-zero energy UEs. Important application areas are deployment of UEs in inaccessible areas and which shall be able to communicate for decades.”

With the Rel-19 SI on ultra-low-power Ambient IoT, 5G takes the next steps to enable energy-efficient massive IoT solutions. It must be ensured that relevant IP is developed in Europe and that there are European providers of such IoT solutions.

Concerned ICT Standards and contribution to the related landscape

The targeted ICT standard is 3GPP 5G-Advanced, i.e. Rel-19 and beyond. The focus is on battery-less devices with and without energy storing capabilities. In fact, with the increasing number of IoT devices, it is impossible to equip each device with batteries that require periodic maintenance (e.g. charging or replacement). Instead, the energy required for wireless communication is harvested from ambient sources, such as radio waves, light, motion, heat or other suitable sources.

The support for Ambient IoT devices in the 3GPP specification is essential to compete in existing markets and create new market opportunities for global connected ultra-low power devices.

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

Impact on SMEs

A successful standardisation of Ambient IoT will enable SMEs to create devices, applications and services that use Ambient-IoT-enabled chipsets. For instance, novel applications for inventory management are specific battery-less sensors for the use in industrial IoT

Impact on Society

Ultra-low-power devices will not only enable more efficient global resource management through increased number of sensors and smart control devices, it will also have a significant positive impact on ICT sustainability and energy efficiency.

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

I am contributing to the 3GPP Rel-19 Study Item (SI) on Ambient IoT. During the last meetings RAN1#116, RAN1#116-bis and RAN1#117, I have submitted 3 contributions with proposals and evaluation results. Those proposals contributed to the agreements reached in those meetings.

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

The work is ongoing. The SI deliverable TR38.769 will be ready by the end of 2024.

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

Once the SI phase finishes, a Work Item (WI) phase is planned in Rel-19. The WI will then result in updated 3GPP specifications including Ambient IoT.

Online references related to the fellowship work

 <https://www.3gpp.org/3gpp-groups/radio-access-networks-ran>

 <https://www.3gpp.org/3gpp-groups/radio-access-networks-ran>

EUDI Wallet (eIDAS2) held personal data access control



Jan Lindquist

*Privacy and security standards expert, Linaltec AB
Sweden*

Sector

Electronic Identification and Trust Services

Engaged SDOs, WGs and TCs



CEN/TC 224 Personal identification and related personal devices with secure element, systems, operations and privacy in a multi-sectoral environment WG20
ISO SC27 Information security, cybersecurity and privacy protection WG5 Identity management and privacy technologies

Role

Expert member

Addressed EU standardisation priorities and gaps

I am leading a new project in CEN TC224 together with several experts to set the requirements and guidelines for wallets (EUDI) when personal attributes are shared to services (relying party) requesting access to the wallet. With my background in ISO/IEC 27560 the goal is to make it crystal clear when an individual grants access and what is required from the wallet to support it. This application builds on previous StandICT.eu grants and achieves a long ambition to apply 27560 across industry sectors. It is also being worked in parallel with standards activity in ETSI and development of the new standards “Relying party authorisations for access to EUDI Wallet”, standard ETSI TS 119 475.

The EUDI wallet held attributes access control project has been accepted and started in CEN TC224 WG20. A challenge has been that the WG20 working group has been very active in reviewing another project, onboarding of PID, which has taken some bandwidth. To help that project I have taken the role to lead a task force to help define the security requirements on the wallet. Wallet security has been a topic I have been expanding to my standards based on my work. **Concerned ICT Standards and contribution to the related landscape**

This insight is starting to have some influence in the development of eIDAS and EU's wallet framework in the privacy area. My new project proposal surrounding privacy requirements on eIDAS and wallet has been accepted. The work will help address the gap of communicating privacy related information like purpose and type of processing when sharing personal data like digital id or attested attributes.

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

Impact on SMEs

The introduction of eIDAS2 to allow digital identity carried in a digital wallet will increase the cross border commerce and travel. The ability to share attested attributes from the wallet will simplify sharing of personal information and there will be many use cases how these attributes can be used. There are several large scale projects that have started in the EU to realise the full potential. The key message is to give the individual the power

to control their personal data BUT without clear purpose how is the individual intended to quickly make a decision to share or not or limit to only mandatory attributes. Nobody reads privacy policies and there is no method to set an individual's preferences. The organisations requesting to have access are not incentivised to take extra precautions like data minimisation. As a comparison Apple's App Store has introduced privacy labels which users can read before they install apps.

This project will set clear guidelines and privacy (GDPR) code of conduct by implementers and data users of the wallet. Accountability will be higher and ability to track where data is shared and how to withdraw. Sharing should be as easy as withdrawing or requesting erasure of the shared data. The usage of ISO 27560 will introduce a standard structure for creating what can be called a "privacy receipt" similar to a receipt from a store. The wallet will have a privacy receipt for every organisation personal information was shared.

Impact on Society

This project will set clear guidelines and privacy (GDPR) code of conduct by implementers and data users of the wallet. Accountability will be higher and ability to track where data is shared and how to withdraw. Sharing should be as easy as withdrawing or requesting erasure of the shared data. The usage of ISO 27560 will introduce a standard structure for creating what can be called a "privacy receipt" similar to a receipt from a store. The wallet will have a privacy receipt for every organisation personal information was shared.

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

Yes, my new project is being worked in parallel with standards activity in ETSI and development of the new standards "Relying party authorisations for access to EUDI Wallet", standard ETSI TS 119 475.

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

Yes. I have been added as co-authored a paper on how ISO 27560 can help implement the Data Governance Act (DGA) to comply with GDPR. This is an important paper that influenced the EU commission to adopt 27560 and DPV. The name of the paper is "Implementing ISO/IEC TS 27560:2023 Consent Records and Receipts for GDPR and DGA"⁴

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

Within CEN/TC 224 WG20 the project "EUDI wallet held attributes access control" has passed in ballot and is actively being developed.

Online references related to the fellowship work

 https://standards.cencenelec.eu/dyn/www/f?p=205:7:0:::FSP_ORG_ID:6205&cs=1E59B4D3EFD280E27AAC0C16CC13CD4FD

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

Digital Certificates supporting Open Finance and PSD3



Michal Tabor

*Expert, Technologie Informacyjne Michal Tabor
Poland*

Sector

Electronic Identification and Trust Services

Engaged SDOs, WGs and TCs



ETSI TC ESI Electronic Signatures and Trust Infrastructures

Role

Rapporteur of the ETSI WI RTS/ESI-0019495v171

Addressed EU standardisation priorities and gaps

In 2023, the European Commission published a regulatory package named PSD3, which includes changes to banking, credit, and financial sector regulations. This constitutes an extension of the existing Open Banking by incorporating FIDA regulations, which will allow the acquisition and use (with customer consent) of financial data stored by other entities. The current version of ETSI TS 119 495 focuses only on PSD2 requirements and the general approach to Open Banking, hence a review of the standard is necessary to develop solutions that can incorporate technical requirements addressing new legal demands and resulting regulations.

Within the existing standard, Qualified Website Authentication Certificates (QWACs) are used, which are issued based on ETSI norms and eIDAS regulation requirements. However, the QWAC certificates ecosystem needs to address requirements stemming from international standards – particularly those from the CABForum, which influence the functioning of the market for all certificates processed by web browsers. A challenge and priority simultaneously is to design certificates used in Open Banking authentication in such a way that they do not conflict with the stipulations concerning QWAC certificates.

Concerned ICT Standards and contribution to the related landscape

The goal of this fellowship is to update the standard developed for Open Banking.

- ▶ ETSI TS 119 495 V1.6.1 (2022-11) – Certificate Profiles and TSP Policy Requirements for Open Banking. This standard describes both the technical requirements for certificates issued for open banking and the requirements for the entities issuing them, which must cooperate with financial supervision institutions in all countries where its implementation applies.

The standard must ensure compliance with the following standards operating in the market:

- ▶ ETSI EN 319 412-1: "Electronic Signatures and Infrastructures (ESI); Certificate Profiles; Part 1: Overview and common data structures".
- ▶ ETSI EN 319 411-2: "Electronic Signatures and Infrastructures (ESI); Policy and security requirements for Trust Service Providers issuing certificates; Part 2: Requirements for trust service providers issuing EU qualified certificates".

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

Impact on SMEs

The targeted ICT standards development activity aims to address the dynamic changes in the European Union's financial services landscape, driven by the Payment Services Directive (PSD3), Payment Services Regulation (PSR), and financial data access (FIDA). The objective is to adapt and enhance existing standards to align with the regulatory updates introduced by PSD3, PSR, and FIDA.

Impact on Society

First, it is critical for maintaining regulatory compliance, enabling financial institutions and service providers to align operations with EU legal requirements. Second, the activity addresses gaps and challenges arising from the dynamic financial services sector, ensuring that ICT standards remain relevant and effective amidst technological advancements and evolving business models. From a European perspective, the standards development activity fosters a harmonised and interoperable financial landscape, strengthening the EU's global position and showcasing a resilient and well-regulated framework.

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

Yes, I contribute actively to the revision of ETSI TS 119 495 V1.6.1 (2022-11) – Certificate Profiles and TSP Policy Requirements for Open Banking.

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

Yes, I contribute to drafting technical specifications.

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

The stable draft was presented at the ETSI ESI 81 meeting at Tallinn. Contributions and comments addressed, and the plan is to send the final draft by the end of May 2024. Then we need to continue working on the standards to get its revision published for 2025.

Online references related to the fellowship work

 https://portal.etsi.org/eWPM/index.html#/schedule?WKL_ID=61917

European Requirements for Biometric Products



Raul Sanchez-Reillo

*Full Professor, Universidad Carlos III De Madrid
Spain*

Sector

Electronic Identification and Trust Services

Engaged SDOs, WGs and TCs



CEN TC224 Personal identification and related personal devices with secure elements, systems, operations and privacy in a multi sectoral environment WG18 Biometrics

Role

Main Contributor, Standard Editor and Liaison Officer

Addressed EU standardisation priorities and gaps

Biometrics has become one of the accepted authentication factors to be used whenever the identity of a citizen is required. This is even noted in the definition of the European Union Digital Identity Wallet (EUDIW), where biometrics is considered one of the authentication factors.

As the EUDIW will be used for nearly any kind of digital service, it is essential to assure that the biometric authentication is done in a robust and secure manner, as not to compromise the identity of the European citizen.

The standards that I work on will help service providers and Administrations in defining their own requirements. Also, it will reduce the need for multiple evaluations from manufacturers.

There have been previous works that are being used as the basis for this work, but when coming to the world of biometrics, some important gaps are detected:

- ▶ Current technical standards are typically generic, covering all biometric modalities, but not going into the specific needs of a certain biometric modality.
- ▶ In international standards, the definition of passing criteria is really challenging, as the impact is worldwide.
- ▶ The few initiatives currently available for certifying these products have been developed independently, without considering potential interoperability.

Within CEN/TC 224 WG18, the PWIs being developed within this action, were approved, targeting the following challenges:

- ▶ Generate European standards or Technical Specifications, with the specifications and criteria.
- ▶ Generate European standards or Technical Specification, with the evaluation methodology and criteria

Obviously, these challenges will be accomplished after several years, but within this fellowship, the work will be focused on activating and continuing developing the PWIs.

The work will cover all main aspects required for a reliable biometric product, focusing initially on facial recognition. Topics covered are Performance, Conformance, Quality and Presentation Attack Detection (PAD).

Concerned ICT Standards and contribution to the related landscape

Both Industry and Society require to have a guarantee that the products they are building/using, conform to certain levels of service/quality/robustness. This assures the society the use of reliable products, building trust in them, and Industry benefit from manufacturing products that will be demanded by society.

Currently, we're working on 4 WDs, being handled as PWI in CEN/TC 224/WG 18.

The 4 PWIs approved are:

- ▶ Part 1: Conformity assessment scheme and application profile definition
- ▶ Part 2: Interoperability tests
- ▶ Part 3: Functionality evaluation methodology
- ▶ Part 5: Face biometrics

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

Impact on SMEs

The proposed activity provides a solution in the field of electronic identification, as is based on the identification of users through biometric means. Many final solution integrators are SMEs, and they are the ones having to convince the final customer with the benefits of using their products. This is typically a challenge of these SMEs, compared to multinational enterprises. This certification scheme will allow SMEs to provide convincing certification to all different customers through a single evaluation, closing the gap with big enterprises, and improving their market ratio.

Impact on Society

This standardisation project will boost the creation of a certification system for biometric solutions to be used in different scenarios. One of the first scenarios to be addressed is the remote identification of citizens using videoconference tools, i.e., using facial recognition with the users' own personal devices (either computers or mobile devices). But other scenarios will be added, such as the use of face recognition in the future EUDI Wallet.

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 multipart standard called "European Requirements for Biometric Products".

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

Yes, I am the main standard editor so I lead by reiterating comments, preparing the final draft version of the standard and preparing the form for the New Work Item Proposal (NWIP).

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

During these last months, all those 4 parts have become mature enough as to progress them to NP through an Activation ballot. This was issued during the first half of this fellowship. The maturity has even reached the definition of application profiles for the use of Face Recognition in use cases such as videoconferencing, or Automatic Border Control.

Therefore, the current fellowship is targeting the activation of the 4 PWIs, as to reach the publication of most of those parts in 2025. All this work will be done targeting a wide consensus and compatibility among the currently existing local initiatives.

Online references related to the fellowship work

 https://standards.cencenelec.eu/dyn/www/f?p=205:7:0:::FSP_ORG_ID:6205&cs=1E59B4D3EFD280E27AAC0C16CC13CD4FD

 https://standards.cencenelec.eu/dyn/www/f?p=205:7:0:::FSP_ORG_ID:793533&cs=187EBF01883EED11B9B1294ABDE6893DE

Towards standards convergence for digital identity



Julien Bringer

CEO, Kallistech

France

Sector

Electronic Identification and Trust Services

Engaged SDOs, WGs and TCs



ISO/IEC JTC 1/SC 17 Cards and security devices for personal identification

ISO/IEC JTC 1/SC 27 Information security, cybersecurity and privacy protection

ISO/IEC JTC 1/SC 27/WG 5 Identity management and privacy technologies

CEN/CENELEC JTC 13 Cybersecurity and data protection

CEN/TC 224 Personal identification and related personal devices with secure element, systems, operations and privacy in a multi-sectoral environment

CEN/TC 224/WG 18 Biometrics

CEN/TC 224/WG 20 European Digital Identity Wallets

Role

Member

Addressed EU standardisation priorities and gaps

As highlighted in the report from ENISA (July 2023) DIGITAL IDENTITY STANDARDS - Analysis of standardisation requirements in support of cybersecurity policy, there are many standards developed by different groups that have dependencies with each others and there is a strong need for better coordination for preparing the future applications of trusted and more decentralised digital ID. From the EU digital identity wallet initiative, and now the recently adopted eIDAS2 regulation, several EU standardisation groups have already started to define future projects to cover the regulation (e.g. CEN/TC 224/WG 20 with TR 17982 European Digital Identity Wallets standards Gap Analysis). There are also several EU-funded pilots on-going and more and more discussions in various standard bodies due to the expectations to be ready to launch wallets in the different EU member states by 2026. This trend for more interoperability of digital identities and higher control by end-users on how/when identifying attributes are shared with service providers is not exclusive to the EU, and will be supported by different technologies and standards already existing or under development within various groups. Some well known identity management standards (like for instance ISO/IEC 24760 series) and related authentication assurance frameworks (in particular ISO/IEC 29115) still have to evolve and higher coordination between the different groups involved in such trend is needed to cope with decentralised identity, digital identity wallets and EU framework.

Concerned ICT Standards and contribution to the related landscape

This fellowship enables them to monitor and contribute to several committees and working groups dealing with the mentioned topics. This thus helps to ensure consistency

between the different groups, in particular contribution to more consistency between ISO existing standards and new works from CEN/TC 224, as well as to ensure EU-compatible contributions to items on identity and authentication frameworks in SC 27/WG 5.

The activity includes monitoring, commenting and participating on the different on-going projects, in particular the following ones :

- ▷ ISO/IEC 24760-4 A framework for identity management - Part 4: Authenticators, credentials and authentication (3rd WD)
- ▷ ISO/IEC 29115 Entity authentication assurance framework (revision started in April 2024)
- ▷ ISO/IEC JTC 1/SC 17/AG 3 on digital [identity] wallets
- ▷ CEN/TC 224/WG 20 Digital wallets projects (Guidelines for the onboarding of user personal identification data within European Digital Identity Wallets)

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

Impact on SMEs

Impact on the compatibility between EU and international frameworks related to digital identities and digital credentials. Many actors, including SMEs, in decentralised identity and digital identity wallets areas, have been active in the EU to develop the technologies, and their sustainability will be impacted by the standards.

Impact on Society

Digital identities, and the way to ensure appropriate levels of assurance and handling of corresponding credentials, together with handling privacy, are key for the digital society.

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

A new revision of ISO/IEC 29115 was launched in April. Early discussions for potential new projects or revisions around digital identity wallets and decentralised identity in SC27 and SC17, including challenges on the alignment of identification & authentication frameworks between EU and US.

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

I contribute mostly comments and texts to the on-going standards drafts at this stage

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

I see that there are strong needs for further efforts in the next 2-3 years to cover digital identity standardisation needs

Online references related to the fellowship work

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

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

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

🔗 https://standards.cencenelec.eu/dyn/www/f?p=205:7:0:::FSP_ORG_ID:6205&cs=1E59B4D3EFD280E27AAC0C16CC13CD4FD

Advance Biometric System-on-Card standard series ISO/IEC 17839



Robert Mueller

Independent expert, Dr. Robert Mueller IT Consulting
Germany

Sector

Electronic Identification and Trust Services

Engaged SDOs, WGs and TCs



ISO/IEC SC17 WG11 Cards and security devices for personal identification

Role

Project editor

Addressed EU standardisation priorities and gaps

Technology for Biometric System-on-Card (BSoC) has advanced significantly since the first publication of the ISO/IEC 17839 series from 2014-2016. This made an amendment of part 2 necessary in 2021 and a revision started 2022/2023. Major gaps are that the currently published standards partially refer to outdated technology and do not cover many recent industry developments in the field of BSoC. This includes enrolment methodologies, sensor and card manufacturing, but also processes and usage of biometric cards. The priority is to consider all inputs from national bodies, come to a consensus and progress the standard series according to the ISO business plan. Challenges are diverse inputs from industry delegates targeting different solutions. This may lead to another part in the ISO/IEC 17839 series.

Concerned ICT Standards and contribution to the related landscape

This fellowship covers the multi-part standard ISO/IEC 17839 Biometric System-on-Card. A BSoC is a smart card that includes an entire biometric verification system with capture device, signal processing, storage, comparison and decision/action. Part 1 specifies core requirements including the architecture of a BSoC and types. Part 2 covers physical characteristics for all formats and part 3 is responsible for logical information interchange with the outside world of a BSoC. The standard is referenced by multiple applications including payment scheme specifications by Mastercard and Visa. Other applications include government ID, access control and transport. The initiation of a revision of the standard was due to the regular ISO cycle period and due to liaison input requests from applications mentioned above.

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

Impact on SMEs

The standard promotes Biometric System-on-Card architecture, characteristics and interfaces. It is a technology that improves security and privacy for citizens in Europe and beyond, because personal data remains on a personal card. The interoperability achieved with this standard helps particularly SMEs who typically provide only a single component to a BSoC while larger corporations could provide an entire solution which may be proprietary.

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

Yes, I contribute to advance the revision of the key ISO standard series for the Biometric System-on-Card technology and contribute to related documents and liaisons of the working group ISO/IEC SC17 WG11.

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

Yes, I contribute drafting documents to the ISO/IEC 17839 series based on the approved comments and submit them for a letter ballot.

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

The BSoC industry is concentrated in France, Germany, Sweden and Norway. While other nations including China, US, Singapore contribute to the standard, the key drivers are European. It is important to defend European industry interests in this standard series. European citizens benefit from improved privacy and plurality thanks to the openness and interoperability

Online references related to the fellowship work

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

 <https://www.iso.org/standard/60759.html>

Standards for new on-chip Integrated Circuit Quantum Random Number Generator (ASIC QRNG) devices



Witold Jacak

Associate Professor, Wroclaw University of Science and Technology.

*Expert, European Information Technologies Certification Institute
Belgium*

Sector

Quantum Technologies

Engaged SDOs, WGs and TCs



EITCI Workgroup of the Quantum Standards Group (QSG) - QRNG

Role

Chair of the Board of Directors of EITCI Institute

Coordinator of the EITCI Quantum Standards Group

Addressed EU standardisation priorities and gaps

My fellowship advances previous contributions to quantum cryptography standardisation in terms of its key enabling technology, i.e. quantum random numbers generation. Continued effort in QRNG standards including approaches based on non-entanglement and entanglement schemes, with technical referencing of implementation techniques is expected to supporting uptake of the QRNG technology which is considered to be of an enabling importance for the future of cryptography and communication, especially in view of recent quantum supremacy breakthroughs conditioning quantum internet's operability.

While the QKD technical standards are developed for several years and are now mature enough to provide device independent security (e.g. due to efforts of the ETSI QKD-ISC Industry Specification Group, in works of which I contribute since 2013), there are currently limited technical reference standards scopes for quantum randomness, despite the QRNG being a key enabler for QKD. The only two international QRNG standardisation initiatives both from 2019 include ID Quantique's coordination of the efforts towards a dedicated WG establishment on the forum of the ITU-T, and the applicant's coordinated EQRNG-QSG WG hosted by EITCI.

New concepts and technical developments in quantum randomness generation and testing throughout the recent years will facilitate drafting of extended QRNG in-depth technical reference standards, beyond the scope of the currently limited QRNG standards inventory, compiling inputs from international SDOs' relevant WGs and domain experts, aiming at further consolidation of a high expertise level required for successfully supporting international efforts in quantum technology standardisation.

Concerned ICT Standards and contribution to the related landscape

My fellowship comprises new activities in advancing international standardisation efforts for new QRNG on-chip (ASIC) technology under applicant's coordination of the EITCI Quantum Standards Group (currently joining ca. 300 experts in quantum information

and cybersecurity, cf.) and towards establishing a liaison with the CEN/CENELEC JTC 22 Quantum Technologies (proposing forming a dedicated JTC 22 WG).

With this work, I support standardisation efforts in quantum information processing and communication (QIPC) technologies for facilitating their uptake as roadmapped in the EU Quantum Flagship program⁵. It aims to advance international work on standardisation of non-entanglement quantum random numbers generation (non-entanglement QRNG), simultaneously supporting Europe's position on international SDOs/SSOs forum and leveraging on EU's far-reaching quantum infrastructure projects.

These efforts are complementary with international standardisation actions. In Europe ETSI has established in 2008 the Industry Specification Group working on QKD, ETSI QKD-ISC (as outcome of SECOQC), and on an international level quantum standards efforts take place in cybersecurity and networks WGs, mainly under JTC 1 of ISO/IEC. The CEN and CENELEC recently signed agreements with ISO and IEC through which common European and international standards are developed in parallel without duplication, emphasising European role in initiating several international quantum standards. Quantum standardisation is developed also in QISS of IEEE (P1913, P7130, P7131 WGs), ITU-T and ISA and NIST in the US. In 2018 the European QF Programme launched the Quantum Internet Alliance joining 12 research groups from 8 EU countries along with 20+ companies, working towards a breakthrough in quantum repeater technology enabling intermetropolitan exchange of entanglement that conditions practical quantum internet.

In October 2019 another breakthrough was reported with the Google Sycamore quantum processor achieving the result of the quantum supremacy (i.e. advantage over all classical computing power in regard to a specific problem related to binary sequence randomness verification – the result was preceded by the EQRNG work which took place in 2017⁶).

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

Impact on SMEs

With progress in quantum computation increasing investments are allocated at quantum technologies, especially in QIPC. Programs such as the Quantum Flagship in Europe have counterparts globally allocating billions of dollars in R&D. SMEs play a crucial role in development of innovation and with quantum technology it is no exception. Standards for basic quantum infrastructures such as quantum information (qubits) encryption in future quantum networks can support innovation in quantum communication technology and accelerate its uptake, towards the future quantum internet.

Impact on Society

Inclusion into international quantum technical standardisation concepts stemming from the EU not only enhances quantum technology but also secures European interests in terms of intellectual property share in quantum technology commercialisation.

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

Yes, and there are two on-chip QRNG ASIC reference standards:

- 1) RS-EITCI-QSG-QRNG-ASIC-PROTOCOL-STD - QRNG ASIC protocols (definitions, key theoretical concepts and use cases for on-chip QRNGs)
- 2) RS-EITCI-QSG-QRNG-ASIC-IMPLEMENTATION-STD - QRNG ASIC implementation (technical specification of processes, devices and operative parameters for on-chip QRNGs)

5 <https://qt.eu/>

6 <https://patentscope.wipo.int/search/en/detail.jsf?docId=WO2019132679>

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

Yes, I contribute to two Reference Standards documents, working there towards final acceptance and publication with dissemination.

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

At the moment of sharing my fellowship story, my project is in it's Phase II including RFCs reiteration, expanding QRNG-QSG workgroup, acceptance, publication and dissemination of the consolidated on-chip QRNG ASIC Reference Standards, inviting more experts to join the QRNG-QSG, also launching a motion towards establishing a dedicated WG under the CEN/CENELEC JTC 22. The EITCI Quantum Standards Group membership among experts in quantum technologies has surpassed the number of 320.

Online references related to the fellowship work

 <https://eitci.org/technology-certification/qsg>

 <https://eitci.org/technology-certification/qsg/eqrng>

3. Innovation for Digital Single Market



■ Smart Contract Auditing guidelines



Christophe Ozcan

CEO Crypto4All

France

Sector

Blockchain and Distributed Ledger Technologies

Engaged SDOs, WGs and TCs



ISO/TC 307 Blockchain and Distributed Ledger Technologies WG 3
Smart Contracts and their applications

ISO/TC 307 JWG4 : Securit, Privacy & identity for blockchains

Role

Expert member

Addressed EU standardisation priorities and gaps

Myfellowship tackles risk Mitigation and Consumer Protection. By addressing security gaps and vulnerabilities in Smart Contracts, the standards development activity contributes to risk mitigation. This, in turn, protects consumers, businesses, and stakeholders from financial losses, legal disputes, and reputational damage, promoting a secure and trustworthy digital environment.

Concerned ICT Standards and contribution to the related landscape

With this fellowship, the aim is to create and continue working on a Technical standard proposal, and I decided to push such action to Joint Working Group 4 which is directly in liaison with ISO/SC27 in charge of the security of IT systems. At the moment there is a technical debate that we are solving to validate specific technical specifications for the auditing security part of smart contract or to merge this subject to a more global technical specifications including all security aspects of smart contract.

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

Impact on SMEs

The smart contract auditing guidelines should help security experts, auditors, and companies using such a technology layer better understand all the requirements and processes needed.

The security of smart contracts are a key element for SMEs to provide a safety solution for their end users. Using a distributed and decentralised network implies new tools and guidelines in terms of security and performance.

Many Blockchain/DLT solutions before going live are trying to mitigate security risks for their business and application by trying to develop and audit smart contracts as much as possible. Unfortunately at this moment there is no standard covering all security procedures helping them and the industry to have the same security requirements.

Impact on Society

By working on standards to enhance Smart Contract security, the project aims to build digital trust. This contributes to the secure use of digital technologies, fostering confidence among users, businesses, and policymakers.

Smart Contracts on blockchain networks pose unique security challenges. The project aims to establish a standardised approach to address these challenges, thereby reducing legal, financial, and reputational risks. This contributes to the overall resilience of digital technologies in Europe.

Moreover, the Smart Contract security standard aligns with regulatory efforts and legal frameworks in Europe. It provides clear guidelines for developers and businesses to ensure compliance with evolving regulations, offering clarity in the legal landscape for secure and compliant digital infrastructures.

Finally, standardising Smart Contract security promotes interoperability, allowing for seamless collaboration across borders and industries. This aligns with Europe's goal of creating a connected and interoperable digital market, facilitating collaboration in the digital space.

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

Yes, I proposed to launch a new work item proposal for a technical specification related to smart auditing contracts PWI 24875,

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?

During the plenary meeting in Spain (from 3 to 7 June 2024) it was suggested to continue the discussion about this topic and find a consensus to approve my TS proposal for auditing scope. The plan is to ask ISO/SC27 involvement from their experts to join JWG4 to submit their feedback. The majority of experts validated the need of this topic but now to avoid overlaps we have all to decide if this TS should be launched/validated as a single TS or be part of a more general TS for Security of Smart Contract. Whatever the decision will be in upcoming meetings the redaction/participation on this topic is still needed.

Online references related to the fellowship work

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

 https://www.researchgate.net/publication/379838925_Security_Guidance_of_auditing_smart_contract_on_Blockchain_and_Distributed_Ledger_system

Develop use cases to inform new standards development in DLT & blockchain technologies



Caroline Thomas

*Innovation Consultant, ISO
Greece*

Sector

Blockchain and distributed ledger technology

Engaged SDOs, WGs and TCs



ISO/TC 307 Blockchain and DLT Technologies, WG6 Use Cases
ISO/TC 307 Blockchain and DLT Technologies, AG3 Digital Currencies
ISO/ TC 68 Financial Services
CEN-CENELEC JTC19 - Blockchain and Distributed Ledger Technologies,
and expert member of the respective UK BSI mirror groups (BSI / DLT1 and BSI / IST/12).

Role

Convenor of ISO/TC 307 WG6 Use Cases and expert member in other groups

Addressed EU standardisation priorities and gaps

The challenge of this fellowship activity is to enable standards that keep up with the market demand for informed information on rapid evolution of blockchain/DLT technologies and decentralised business models.

The timing of new regulations is a key priority for standards makers, where there can be international divergence in approaches to both the use of DLT/blockchain technologies, and domain areas such as financial services, ESG management and privacy & security.

Therefore, the new ISO/AWI TR 24878 report considers new and emerging DLT/Blockchain Use Cases, which applies a use cases methodology to bridge the gap by providing expert insights from a business, technical and social/regulatory perspectives. The integrated use case approach can inform business leaders, technical developers and policy makers/regulators who are seeking insights into the applications of DLT/blockchain, in areas such as interoperability, resilience and alignment of new tech (eg: AI, crypto, DLTs).

Concerned ICT Standards and contribution to the related landscape

The new ISO Technical Report aims to contribute to the ICT Standards Landscape for DLT/blockchain applications covering sustainability, provenance, digital currencies, tokenisation, and supply chain efficiencies.

ICT standards I am dealing with include:

- ▶ ISO/AWI TR 24878 New and emerging DLT/Blockchain Use Cases
- ▶ ISO/AWI 24982 Digital Currencies – Vocabulary
- ▶ ISO/AWI 20435 Representing Physical Assets using Non-Fungible Tokens

These build on related standards across the ISO/TC307 work programme.

- ▷ ISO/TR 3242:2023 Blockchain and distributed ledger technologies – Use Cases⁷ (Convenor and Co-editor)
- ▷ ISO/TR 6039: 2023 - Blockchain and distributed ledger technologies-Identifiers of subjects and objects for the design of blockchain systems⁸ (Convenor)
- ▷ ISO/TR 6277: 2024 -Blockchain and distributed ledger technologies –Data flow model for blockchain and DLT use case⁹ (Convenor)
- ▷ ISO 23257:2022 Blockchain and distributed ledger technologies—Reference architecture
- ▷ ISO/TS 23258:2021 Blockchain and distributed ledger technologies — Taxonomy and Ontology
- ▷ ISO/TS 23635:2022 Blockchain and distributed ledger technologies — Guidelines for governance
- ▷ ISO/TR 23644:2023 Blockchain and distributed ledger technologies (DLTs) — Overview of trust anchors for DLT-based identity management

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

Impact on SMEs

This contribution has a wide impact for European SMEs. One example is where in my role as Convenor of ISO/TC307 WG6 Use Cases, we invite international SME experts to get involved in regulatory and standards development processes by sharing their insights and creating use cases into emerging technologies. This approach can enable faster adoption of their business and technical models, and for European SMEs, who create perspectives consistent with EU regulations and societies, such as privacy (GDPR, AI Act) and sustainability (Net Zero and ESG). (See section 2.1) In the lead-up to the ISO/TC 307 Plenary on 4 June 2024, we have gathered 10+ SMEs to showcase and present leading DLT solutions from SMEs, plus involvement in multiple SDO and entrepreneur events including Blockchain Ireland, INABTA etc.

Impact on Society

This work sources use cases that can support societal impacts across international priorities such as Net Zero goals for climate change. They can support European values, democracy, and human rights based on European societal regulations including:

- ▷ Privacy: new Data Act, GDPR
- ▷ Fintech and Defi: MiCA crypto regulations
- ▷ Sustainable initiatives: carbon markets
- ▷ Interoperable platforms: EBSI, digital passports,
- ▷ And in 2024 the EU Artificial Intelligence Act

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

This project is the result of a specific recommendation for a new standard: ISO/AWI 24878. This was approved at the ISO/TC 307 Plenary in November 2023, and is now in its early set-up stage. It is new standard that builds on a number of published standards.

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

Yes, I have contributed to technical reports.

⁷ <https://www.iso.org/standard/79543.html>

⁸ <https://www.iso.org/standard/81978.html>

⁹ <https://www.iso.org/standard/82158.html>

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

This project is in its first 6 months of development, but due the rapid evolution in these technologies and their applications (eg: Metaverse, web3, digital passports, digital twins, sustainability etc) there is a focus to publish in an efficient timeline, to remain timely and relevant to the market. We are applying efficiencies based on our 3 previous published reports: ISO TR3242, ISO TR6039 and ISO TR6277.

Online references related to the fellowship work

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

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

 <https://www.iso.org/committee/49650.html>

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

 <https://www.iso.org/standard/88729.html>

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

Developing the Strategic Business Plan for Standards Development in ISO/TC307 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 Blockchain and distributed ledger technologies
ISO/TC 307/AG 1 SBP Review Advisory Group
Joint ISO/TC 307 - ISO/IEC JTC 1/SC 27 WG: Security, privacy and identity for Blockchain and DLT.
ISO/TC 307/AG 2 Liaison Advisory Group
ISO/TC 307/CAG 1 Convenors coordination group
ISO/TC 307/WG 5 Governance
ISO/TC 307/WG 6 Use cases
CEN/CLC/JTC 19/WG 01 "Decentralised identity management"

Role

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

Addressed EU standardisation priorities and gaps

From the European perspective the project brings GDPR, interoperability and eIDAS priorities (for instance) to global standards, particularly in security, identity and privacy. The European Interoperability Framework has already been proposed as one organising model for the development of DLT/Blockchain standards. My fellowship project carries that European model forward into the core planning documents of the Technical Committee.

The challenges addressed from a European perspective include specific topic areas have already been included in the draft contents list. These reflect the current status of DLT/blockchain including Security, Value Transfer (incl. CBDC), NFTs, Identity, Metaverse, AI, Digital Product Passport, and Privacy.

These are approached in a way that reflects the EU's IT planning approach and strategy. It is necessary that ISO/TC307 future planning encompasses these gaps developing in the global standards architecture, especially given the multilateral nature of the technology. For example, the more rapid development of international consensus on Identity systems will be one of the initial beneficiary areas, indicating that European work in this area can accelerate with international consensus solidifying.

This work is also focused on prioritising work on standards that are immediately applicable to regulators and cross border agencies. 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.

Concerned ICT Standards and contribution to the related landscape

With this fellowship, I contribute by guiding the priorities, scope and content of all standards under development of the TC, and what should be developed in the future. The nine standards impacted are:

- ▶ ISO/AWI 20435 Representing Physical Assets using Non-Fungible Tokens¹⁰ -
- ▶ ISO/PWI 24875 Secure Smart Contracts¹¹
- ▶ ISO/AWI TS 23353 on Auditing guidelines¹²
- ▶ ISO/WD TS 23516 on Interoperability Framework¹³
- ▶ ISO/WD TR 24332 on authoritative records, records systems, and records management¹⁴
- ▶ ISO/AWI PAS 24874 on Use of Smart Contracts in Contributing to the Sustainable Development Goals¹⁵
- ▶ ISO/AWI TR 24878 on DLT/Blockchain Use Cases¹⁶

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

Impact on SMEs

As an example, positive security are 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 criteria for making such decisions needs examination, and the approach comparative measurement needs standards to be effective. Thus, my fellowship makes the links between the SMEs operating in the business arena and the standards development to support their operations.

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 and the scope of every proposed standard the TC considers.

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

Yes, I contribute to both technical specifications and technical reports of the nine standards named here above.

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

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

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

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

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

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

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

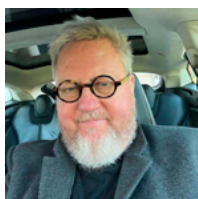
What future efforts or activities are still necessary for your area of application?

The placement of TC 307 into the pilot program for the ISO new Strategic Business Planning process, which involves an exciting opportunity to develop an altogether more strategic new plan, although now includes a great deal of additional feedback work into ISO CS.

Online references related to the fellowship work

 www.iso.org/committee/6266604.html

JWG between ISO/IEC JTC1 and IEC/SyC Smart Cities on Local Digital Twins



Torbjörn Lahrin

Co-convenor representing JTC1, Lahrin i Hajstorp AB
Sweden

Sector

Metaverse Including CitiVerse

Engaged SDOs, WGs and TCs



ISO/IEC JTC1 SC41 Internet of things and digital twin

Role

Convenor of ISO/IEC JTC1 SC41 Internet of things and digital twin AG21 Advisory

Addressed EU standardisation priorities and gaps

Cities, regions and countries all over the world are building Local Digital Twins using various tools and approaches. Game engines, CAD tools, GIS, AR/VR/XR tools, Urban Digital Platforms, CIM and other visualisation tools are used. Thus a wide spread of technologies and standards.

Interoperability for Local Digital Twins (LDT) is crucial. They need to fit horizontally and vertically. Horizontally is to put a LDT of one city next to a LDT of another city, make them align. European CitiVerse are built upon Local Digital Twins. If separate Local Digital Twins in Europe don't fit together it will be impossible to create a seamless CitiVerse. It will also be difficult with interoperability between LDT:s. Vertically, a LDT produced by a city must fit the LDT from public transportation and LDT by the energy company, etc.

The LDT also needs interoperability versus dataspace and IoT. For a LDT:s to be useful for officials and others, LDT:s need interoperability with the business operating systems used by officials on a daily basis.

Thus, the result of my current fellowship is a gap analysis and technical report including advice to all relevant major SDOs on how to develop or change their standards to fit better together. The JWG will also lay the foundation for producing an international reference architecture for LDT:s aligned with the international reference architectures for Digital Twins, IoT and Smart Cities among others.

Concerned ICT Standards and contribution to the related landscape

Local Digital Twins & CitiVerse will involve many standards. The report "Landscape of CitiVerse Standards" lists about 350 standards to be considered for LDT:s and CitiVerse. The JWG will analyse these and give advice to responsible SDO:s. Thus, my fellowship contributes to a large number of standards in the ICT Standards landscape.

Terms of Reference for the JWG states that the LDT reference architecture should be aligned with:

- ▶ ISO/IEC 30141 - IoT Reference Architecture
- ▶ ISO/IEC 30188 – Digital Twin Reference Architecture
- ▶ IEC IEC 63205 – Smart Cities Reference Architecture.

Thus the JWG will contribute to a large extent to these + other related standards, Technical Specifications and Technical Reports such as:

- ISO/IEC 21823-1: Interoperability for IoT systems — Part 1: Framework
- ISO/IEC 21823-2: Interoperability for IoT systems — Part 2: Transport interoperability
- ISO/IEC 21823-3: Interoperability for IoT systems — Part 3: Semantic interoperability
- ISO/IEC 21823-4: Interoperability for IoT systems — Part 4: Syntactic interoperability
- ISO/IEC 21823-5: Interoperability for IoT systems — Part 5: Behavioural and policy interoperability
- ISO/IEC 30149 Trustworthiness Principles.
- JTC1/SC41 - PWI - Guidance on IoT and digital twin integrations in data spaces.
- JTC1/SC41 - TR Digital Twin - Correspondence measure of DTw twinning
- JTC1/SC41 - PWI 16 - Digital Twin - Extraction and transactions of data components
- JTC1/SC41 - PWI 19 – Guidelines for digital twin entity modelling
- ISO/IEC TR 30194 ED1 Internet of Things (IoT) and Digital Twin Best practices for use case projects
- JTC1/SC38 PWI 20151 - Dataspace concepts and characteristics
- ISO/IEC TS 10866 - Organisational Autonomy and Digital Sovereignty.

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

Impact on SMEs

Investing in Local Digital Twins and CitiVerse is today rather challenging. All technologies for creating LDT:s or CitiVerse have their strengths and weaknesses. Any investment made today is therefore associated with a rather high degree of uncertainty. Still, the SME:s and societies of Europe have to invest already now in these technologies to have a chance to be “on the train” and ahead in the competition. However, this also comes with a large risk that European SMEs and societies to some extent might find themselves investing in the “wrong” direction with techniques and methods that will not be long lasting. To know what other actors are doing all around the world will help to navigate and to invest in “right” directions with long term safer investments. Once we get an international reference architecture for LDT:s in place this will give even more security for those parties following the international standard.

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

The JWG and project is expected to give guidance to all SDO:s having standards related to Local Digital Twins and CityVerse. Provided there are about 350 standards, technical specifications and technical reports listed in the report “Landscape of CitiVerse Standards” for StandICT.eu there will most likely be a large number of these standards that will be subject for revision in accordance with the analyses and recommendations from the project.

Furthermore, the project has been assigned the task to create an international ISO/IEC reference architecture for Local Digital Twins in alignment with ISO/IEC 30188, ISO/IEC 30141, IEC 63205 – Smart Cities Reference Architecture and other relevant standards.

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

Yes, the result of my current fellowship is a gap analysis and technical report including advice to all relevant major SDOs on how to develop or change their standards to fit better together.

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

It is worth noticing that the work of CitiVerse and Local Digital Twins has a lot in common with work being done regarding Metaverse. However, currently much of the work both regarding Local Digital Twins and Metaverse are focused on graphical representation issues. That is true both on national level as well as at the JTC1 level. These graphical and visualisation aspects are of course challenging and important. However, from a European perspective, the CitiVerse and Local Digital Twins are more about Interoperability with European Dataspaces and IoT and issues regarding such things as trust, privacy, and a lot of other things apart from the graphics and visualisation. It might also be worth noticing that the methods for creating “real world 3D copies” differ a lot from the methods for creating a fictional digital 3D world for Metaverse. Given this context, it would be valuable if we can make efforts to engage more European Experts.

Online references related to the fellowship work

 www.iso.org/committee/6483279.html

4. Sustainable Growth



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
CEN/CLC/ETSI CG-SG

Role

Co-Convenor of JWG3 “Smart Energy Roadmap” between IEC SyC Smart Energy and ISO/IEC JTC1/SC41 and member in the other groups.

Addressed EU standardisation priorities and gaps

My fellowship contributes to the following priorities of the rolling plan for ICT standardisation:

Firstly, in the field of public sector information, open data and big data, with my engaged work I promote standardisation, and support of standardization activities via my involvement in various European research and innovation projects. Also, in my engaged groups, we bridge the gap between the EU R&I ecosystem and IEC standardisation.

In parallel, in the field of Internet of Things, I continue contributing to the ongoing work in the area of semantic standards. The engaged working groups provide standards that can be used for compliance for IoT products, systems, applications and processes. Also, we promote the development and foster the adoption of the international Reference Architecture for IoT developed in ISO/IEC JTC 1/SC 41

When focusing on Smart grids and smart metering, my standardisation efforts content the incorporation of SAREF into the full demand-side flexibility chain where SAREF is considered in BRIDGE and in IEC TS 63417 project. Also, via my active contribution especially to NTERCONNECT, BRIDGE and IntNET projects, we foster the collaboration among the different European standardisation efforts on the area.

Finally, I also deal with the standardisation related to Electric vehicles (EVs) as the ongoing work with the IEC TS 63460 will support the grid integration of EV charging infrastructure

Concerned ICT Standards and contribution to the related landscape

The IEC System Committee Smart Energy deals with systems level standardization, 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 which focuses on Internet of Things and Digital Twin.

This 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 co-ordinate their integration into Smart Energy standardisation.

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

- ▶ IEC TR 63097 Smart Energy Roadmap: the on-going work aims to update this standard (dated 2017) in particular the standards mapping and gap analysis, include 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 being 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 expert to contribute to 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 are taken into account at worldwide standardization level, with the support of CEN/CLC/ETSI CG-SC, and I am disseminating the relevant on-going standardization activities to the four abovementioned initiatives.

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

Impact on SMEs

Firstly, my company (Trialog) is a European SME, which is impacted by my contribution. In particular, my activities in IEC SyC Smart Energy and ISO/IEC JTC1/SC41 allow 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 to share experience based on our R&I projects and to learn from the experience of other projects and actors

Secondly, European SMEs from the smart energy sector, in particular those involved in EU R&I projects, are impacted by my contribution on two aspects: on one hand worldwide standards are better aligned with the EU R&I ecosystem, making it easier for Europeans SMEs to make business at worldwide level (less specific development). On the other hand, 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?

My activities aim to:

- ▶ Update IEC 63097 Smart Energy roadmap
- ▶ Develop IEC 63460 Architecture and use-cases for EVs to provide grid support functions

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

Yes, System Reference Deliverables (SRD): IEC SRD 63460 and update of IEC TR 63097.

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

Additional efforts are required to pursue the bridge between EU R&I and ISO/IEC standardisation and specifically contribute to the two following projects:

- ▶ IEC 63097 “smart energy roadmap” update (on-going)
- ▶ IEC 63460 SRD on “Architecture and use-cases for EVs to provide grid support functions”

Online references related to the fellowship work

 www.iec.ch/dyn/www/f?p=103:186:0::::FSP_ORG_ID:11825

 www.iso.org/committee/6483279.html

■ Lifts and Escalators in Smart Cities



Gero Gschwendtner

*Prof. Mechanical Engineering (HTL St. Pölten) and
Independent Consultant, Gschwendt
Austria*

Sector

Smart and Sustainable Cities

Engaged SDOs, WGs and TCs



ISO/TC 178 Lifts, escalators and moving walks WG4 and WG6
CEN/TC 10 Lifts, escalators and moving walks WG 2
ON AG 017 Aufzüge, Fahrtreppen und Fahrsteige;
ON AG 017.02; Joint Working Group (JWG)
CEN/TC 10/WG 2 - SAC/TC 196 joint working group; Global Technical
Advisory Group of Worldwide Elevator and Escalator Federation
(WEEF)

Role

Chairman ISO/TC 178

Convenor CEN/TC 10/WG 2

Expert in the other groups

Addressed EU standardisation priorities and gaps

Until 2022 the lift and escalator sector lacked any specific ICT standard, except for the cybersecurity standard. Initially, the philosophy driving the standardisation efforts within ISO/CEN was to incorporate all subjects into the core product standards, referred to as the “product bible” ISO 8100-1/2 and EN 115-1 (in the process to be published as 1:1 as ISO 8103-1; approved as a NWI 20.07.2023 and currently ballot ongoing for skipping circulation of CD draft and move project directly to DIS stage). Over the years, as specific topics grew increasingly complex, supplementary standards were developed to support the main product standards.

It became evident that ICT was lacking in comprehensive coverage, given its rapid advancement. Consequently, a decision was made to analyse this situation, formulate a future strategy, address this issue, and bridge the gap. The creation of these new standards and technical specifications is of utmost priority.

Simultaneously, the main product standards (referred to as the “product bible”) must be maintained, and certain general ICT aspects need to be incorporated within them.

Furthermore, a significant challenge faced by ISO/TC 178 and the entire lifts and escalator sector pertains to the ongoing situation in China. Currently, China is undertaking several local standardisation projects at a notably rapid pace. Their release process involves fewer parties and is considerably faster than the CEN and ISO process. This underscores the utmost importance of ensuring that SAC continues its active participation in ISO and takes over all ISO standards as local standards. Consequently, additional connections have been established, and regular exchange meetings are being conducted to exert the greatest possible influence in this matter.

Concerned ICT Standards and contribution to the related landscape

Lifts, escalators and moving walks are essential elements in providing safe access to buildings. There is a strong emphasis on safety, accessibility, energy & environment and highly relevant for the future ISO/TC 178 activities are also focusing now to a strong extent on ICT.

ISO/TC 178/WG 12 “Cybersecurity” was found in 2019. Within 3 years they published the new ISO 8102-20 Electrical requirements for lifts, escalators and moving walks - Part 20: Cybersecurity.

This WG is now preparing ISO TS 8102-21 “On-site and Off-site software updates” for Lifts and escalators including information and operational technology (IT/OT) viewpoints and an Annex for Technical safety requirements for remote software and parameter-updates of the lifts, escalators and moving walks. The first draft was completed in 2023 and the New project ballot registered at the end of 2023. Work on the DTS is currently ongoing and planned to be finished by the end of 2024.

In addition, ISO/TC 178/WG 13 “New Technologies” have been found end 2022 as a result of the work initiated by ISO/TC 178/AHG1 in 2019. This AHG conducted a study in the field of new technologies to be used within lifts and escalators and how to deal with this topic in the future.

This mission has been accomplished and accordingly in the ISO/TC 178 plenary meeting 2022 WG 13 then been found. In addition to the above-mentioned agreed project on ISO/NP TS 8100-10 it was also decided to develop a technical specification for Building Information Modelling considering ISO 19650-1:2018 impact (ISO/NP TS 8100-10). Also the first draft was completed in 2023 and the New project ballot registered at the end of 2023. Work on the DTS is currently ongoing.

Finally, the ongoing work for the lift and escalator product standards, energy standards and risk analysis standard are continuing, where the current focus is on the following standards:

ISO/WD 8100-1, ISO/WD 8100-2, ISO/WD TS 8100-3, ISO/PWI 14798-1, ISO/PWI TR 14798-2, ISO/DIS 8103-1, EN-115-1.

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

Impact on SMEs

ISO/TC 178 has a liaison to:

- ▶ ELA European Lift Association
- ▶ SBS - Small Business Standards with EFESME (European Federation for Elevator Small and Medium-sized Enterprises aisbl) as an expert member for lifts.

Both associations are highly interested in this topic and with this liaison they participate actively at the ISO/TC 178 meetings as well as at the relevant WG meetings.

Chairing the meeting and giving them also relevant time in the meetings to talk and bring up their issues is essential for them; this is under my responsibility and highly considered, even several “big companies” are sometimes not so happy with this approach.

Impact on Society

Lifts, escalators and moving walks are essential elements for the transportation of society. With this work safe access and accessibility for all is provided. Furthermore, this work encompasses energy efficiency and adherence to the United Nations' sustainability goals namely 7, 8, 9, 10, 11, 12, and 13 which are integral components of the standards.

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

Yes, I contribute to both, developing new standards and revising existing ones.

New Standards/Technical Specifications:

- ▷ ISO/WD TS 8100-10: Stage 20.20
- ▷ ISO/WD TS 8102-21: Stage 20.20
- ▷ ISO/DIS 8103-1: Stage 40.20

Revised Standards;

- ▷ ISO/WD 8100-1/2: Stage 40.60
- ▷ ISO/WD TS 8100-3; to be reinitiated
- ▷ ISO/PWI 14798-1 ISO/PWI TR 14798-2 PWI with ongoing work

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

Yes, I contribute to technical specifications as detailed here above.

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

All revisions of standards and contributions to technical specifications are in progress, and this progress follows the ISO stages e.g. duration of the whole project, target dates of the next stages can be seen on the ISO online database.

Online references related to the fellowship work

📎 ISO/WD TS 8100-10: Stage 20.20 <https://sd.iso.org/projects/project/86662/overview>

📎 ISO/WD TS 8102-21: Stage 20.20 <https://sd.iso.org/projects/project/86663/overview>

📎 ISO/DIS 8103-1: Stage 40.20 <https://sd.iso.org/projects/project/73105/overview>

📎 ISO/WD 8100-1/2: Stage 40.60: <https://sd.iso.org/projects/project/80553/overview>

📎 <https://sd.iso.org/projects/project/80554/overview>

📎 ISO/WD TS 8100-3; to be reinitiated <https://sd.iso.org/projects/project/80556/overview>

📎 ISO/PWI 14798-1 & ISO/PWI TR 14798-2 PWI with ongoing work: <https://sd.iso.org/projects/project/84912/overview>

📎 <https://sd.iso.org/projects/project/79397/overview>

Smart Circular Economy Standards for Europe



Julian Lauten-Weiss

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Bergische Universität Wuppertal
Germany*

Sector

Circular Economy Including Digital Product Passport

Engaged SDOs, WGs and TCs



ISO/TC 323/WG 2 Practical approaches to develop and implement Circular Economy
ISO/TC 323/WG 3 Measuring and assessing circularity
ISO/TC 473/AHG 2 Information sharing; ISO/TC 473/AHG 4 Business Models
CEN/TC 473 Circular Economy AHGs

Role

Expert member

Addressed EU standardisation priorities and gaps

In my role as a circular economy expert, I actively contribute to the advancement of Smart Circular Economy Standards for Europe. I ensure that standards align with EU policies like the European Green Deal, advocating for their integration into standardisation efforts. I actively participate in standardisation activities, attending meetings, submitting comments, and contributing to the development of standards related to circular business models and information sharing. Within my technical committee, I am one of few experts under the age of 35, the only PhD candidate and the only startup founder who regularly participates and engages in meetings and discussions. I thereby address the gap in inclusive representation. Further, through effective communication and engagement, I bridge the gap between stakeholders, fostering collaboration and knowledge exchange.

Concerned ICT Standards and contribution to the related landscape

In a wider sense, however, there are several implications of a circular economy on ICT. Some examples are an increased emphasis on the durability and modularity of electronic devices such as mobile phones, new sources of rare earth metals through take-back schemes and urban mining as well as emerging digital platforms enabling service-based business models for sharing and reselling goods. The New Work Item Proposals (NWIPs) I am currently contributing to in CEN/TC 473 will be based on the recently concluded work in ISO/TC 323 (especially ISO 59004, ISO 59010) and will include guidance on business models and information sharing. This will address gaps in the implementation of the Digital Product Passport in organisations.

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

Impact on SMEs

In my work with ISO/TC 323 as well as CEN/TC 473, I strive to align circular economy standards as closely as possible with the vision of a fully circular economic system while

ensuring guidance on feasible steps towards this goal. This will allow European as well as global SMEs to plan ahead and gradually make the transition to a circular economy. The more complete and sustainable this standard will be, the fewer revisions and course corrections will have to follow, leading to long-term regulatory as well as financial certainty for SMEs. The latter point is especially important as an increasing amount of financing is made contingent on the fulfilment of certain sustainability criteria.

Impact on Society

My fellowship also impacts wider European interests, including broad representation of society in important public matters, a climate neutral continent by 2050 and “Mobilising industry for a clean and circular economy” (European Green Deal). Furthermore, as I am part of the new generation of experts in the DIN as well as ISO committees, my activity also supports the goal of fostering a new generation of standardisation experts as laid out in the “EU Strategy on Standardisation”.

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

Yes. In CEN/TC 473, we are currently developing New Work Item Proposals (NWIPs) within out Ad-Hoc Groups (AHGs). These NWIPs will be voted on by the Technical Committee this summer. If the vote is positive, the AHGs will be turned into Working Groups (WGs) with the mandate to develop new or revised standards based on the documents developed in ISO/TC 323.

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

Yes, I contribute by commenting on draft documents. As the comments' quality matters more than their quantity, rather than setting a quantitative target, a more suitable metric is that 100% of all comments made are well-founded and constructive

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

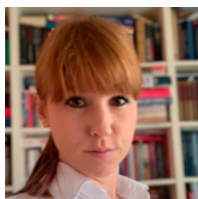
The process of developing NWIPs in CEN/TC 473 will likely become mandatory to start developing new standard documents in summer/fall 2024. The work in ISO/TC 323 concluded earlier this year so soon it will be published and thereby finalised until revisions commence.

Online references related to the fellowship work

 www.iso.org/committee/7203984.html

 https://standards.cencenelec.eu/dyn/www/f?p=205:7:0:::FSP_ORG_ID:3326686&cs=1FB6C33369B0F6BEA8BA7EFC7B26D4309

Deploying standards for AI enabled Photovoltaics (AIPV)



Agnieszka Rządowska

*International Policy Director for Smart Energy Systems, EITCI
Co-Founder, European Solar Network
Belgium*

Sector

Artificial Intelligence

Engaged SDOs, WGs and TCs



EITCI SMART-PV-SESG Smart Energy Standards Group

Role

Chair of the EITCI SESG

Addressed EU standardisation priorities and gaps

One of the gaps identified in the current standardisation efforts is lack of standards for directly applying AI to smart PV systems. The EU Rolling-Plan 2020 emphasises ICT standards in energy, primarily focusing on smart grid management, grid-balancing, and device interfacing. The rapidly growing smart PV market is witnessing significant AI-based innovations in solar cells from various vendors that would benefit from further standardisation. Continued efforts in this scope are crucial to support the EU Rolling-Plan 2020 for ICT standardisation in line with EU policies on Smart Grids and Smart Metering. A key focus is further development of AI-enabled smart PV solar systems. This work aims to provide detailed reference standardisation for identified primary domains of AI applications in PV systems. These include AI-assisted optimisation of solar cell designs and production phases, planning of optimal solar cell system deployments, and optimisation of solar cell operation within smart power grid systems.

Specific AI smart PV applications that need further conceptual and technical reference standards fall into three main areas: material discovery and optimisation approaches (e.g. novel structures for third-generation solar cells and AI methods for optimising the modelling of PV devices during design and production phases), layout and deployment optimisation (e.g. applying AI in weather forecasting, insolation analytics for irradiation mapping, and other factors influencing smart PV deployments), efficiency optimisation and integration with smart grids (fault detection, energy forecasting, life cycle assessment, and decommissioning process optimisation, this includes applying AI for carbon intensity awareness, integrating AI with smart metre data to enhance Smart Grid awareness, performance loss rate determination, power and net-load forecasting, behind-the-metre PV visibility, intelligent hybrid/smart inverters, and AI methods for Maximum Power Point Tracking, MPPT).

Concerned ICT Standards and contribution to the related landscape

My fellowship contributes to advancing reference standards by combining progress in AI with renewable energy generated in grid-connected photovoltaic (PV) systems, along with their smart design and production on the devices level, deployment optimisation, operation-and-maintenance and smart on-grid integration and control. Continued standardisation efforts in AI-assisted smart PV are expected to expand the digital energy

standards inventory and support the adoption of crucial smart energy technologies aligned with the EU climate and energy policy framework. This is particularly relevant given the emphasis on integrating digital and green agendas as key pillars of the EU development strategy. The standardisation efforts aim to define a higher level of abstraction for potential AI applications in smart PV systems across all scales, from residential installations to PV power plants. The goal is to develop SESG-accepted technical reference standards for AI assisted smart PV and ensure integration with other established standards for smart energy and smart grids.

I contribute by coordinating the Smart PV workgroup of the EITCI SESG, established in 2019. This cross-SDO WG includes members contributing to relevant smart energy WGs of international SDOs/SSOs, promoting cooperation in drafting and disseminating smart PV standards for the future. SESG has grown impressively from 30 members in 2020 to over 140 members in 2024. This liaison in cooperation with experts joining the CENELEC / IEC-TC CLC/TC-82 (Solar photovoltaic energy systems) and the CLC/TC-57 (Power systems management and associated information exchange) for power systems control equipment and systems including EMS (Energy Management Systems) and SCADA (Supervisory Control And Data Acquisition).

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

Impact on SMEs

Smart energy is currently not only an important market trend of dynamic growth and rapid technological development, but also a central axis in the EU's Green Deal strategy joining ICT and energy sectors as main pillars for the EU development facing serious energy challenges. Furthermore the green transformation is currently considered to be an important aspect of European energy security, especially in view of the international situation, the Russian invasion on Ukraine and the scaling energy crisis concerning hydrocarbons. In regard to these challenges the European Commission strategically plans to secure advancing renewable energy technologies further enabled by ICT and a leading global position of the EU in smart energy, transforming the global warming and the international situation challenges into a growth opportunity for EU SMEs driving European innovation with a focus on smart energy. Action's efforts in driving international smart PV standardisation supports EU SMEs.

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

Yes, I contribute developing new smart energy standards by advancing AIPV systems definitions, concepts, architectures and use cases and AIPV technical specification of processes and devices under the EITCI SESG AIPV WG,

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

Yes, I contribute notably to technical specifications.

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

As next steps, this activity will result to publication of two advanced Request for Comments documents on:

- 1) AIPV systems definitions, concepts, architectures and use cases,
- 2) AIPV technical specification of processes and devices.

The in-depth expansion towards technical deployment-ready Reference Standards involved in particular the following areas of specifications: 1) solar cell devices design and

production phase, 2) planning of optimal PV systems deployments and 3) optimisation of solar modules operation in power systems with a focus on AI integrated smart PV modules.

Online references related to the fellowship work

 <https://eitci.org/technology-certification/sesg>

Standards for Robotics and Autonomous Systems: Knowledge, Reasoning, and AI for Multiple Robots.



Paulo Gonçalves

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Sector

Robotics and Autonomous Systems

Engaged SDOs, WGs and TCs



IEEE WG 1872.3 – Standard for Ontology Reasoning on Multiple Robots;
IEEE WG 3140 - Semantic Map for Autonomous Robots;
IEEE WG 1872.1.1: Guide for the Practical Implementation of IEEE RAS Standard 1872.1 on Robotic Task Representation;

Role

Chair of IEEE WG P1872.3 for the Standard for Ontology Reasoning on Multiple Robots.

Addressed EU standardisation priorities and gaps

The fellowship works on the current gaps to define, proper and formally, interoperability amongst robotic agents. There is an urgent need, with high level of priority, for a systematic way of representing knowledge and a common set of terms and definitions, ranging from the ICT, industry 4.0/5.0, social sciences and humanities (SSH), ethics, healthcare, IoT, and autonomous systems domains. These allow for unambiguous knowledge transfer among humans, robots, and other AI systems, as well as provide a foundational basis for the definition of the tasks that each robotic autonomous agent must perform, in each environment that should be semantically represented for interoperability, through semantic maps. Moreover, formal terminology definitions and concepts are key to proper reasoning and interactions with, not only a robot, but also for multiple robots and humans.

Three main ideas (semantic maps, reasoning, multiple robots) that are tackled in this fellowship are key to properly deploy robotic and autonomous systems in each mission, and, as such, there is a clear need to standardise this knowledge on an ontological framework.

A first step was done with the IEEE standard 1872-2015, and following standards. Work is still to be done to have a proper interoperability between autonomous systems standards and industrial and healthcare standards, e.g., existing IEEE and ISO specifications.

Within this scope, my current fellowship aims to fill the identified gaps above, under the work of three IEEE WGs works. As the main effort, this activity aims to develop work towards standardisation of ontology reasoning (within WG 1872.3) in several robotic domains: affordances in human robot interaction; trust and security for autonomous robotics; artificial intelligence and machine learning for autonomous robots; multiple autonomous robots and cloud robotics.

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

Impact on SMEs

My fellowship is related to robotics, reasoning, and knowledge representation, based on ontologies. Many renowned robotic companies are based in the EU. An increasing number of state-of-the-art Robotics and autonomous systems use AI based systems for reasoning, mainly because of the increasing complexity of such systems. Nowadays, knowledge representation for robotics services and tasks are currently being regulated worldwide, to which EU SMEs must also comply.

As such, knowledge representation and reasoning for robotics standards will have a huge impact on future robotic and autonomous systems developed by companies.

Impact on Society

The already published standards IEEE 1872-2015, IEEE 1872.2-2021, IEEE 7007-2021, and the IEEE 1872.1, tackled basic definitions, and missed other core concepts such as: AI for robotics, robot affordances, reasoning, semantic maps, multiple robots.

These concepts need to be tackled in the future, worldwide, and specially within the EU. This is largely justified by the strong industry in Europe that needs to keep envisioning the application of AI based robotic and autonomous systems, to continue evolving using digital technologies for increasing income in the EU.

The combined result of this effort is that a robotic solution defined and developed by one vendor or research group should be able to perform tasks and reasoning without modification on another group's hardware. It is envisioned that these series of standards will be applicable anywhere that complex robot tasks and reasoning is required. The working groups of this fellowship are follow-up efforts of the seminal IEEE Std 1872-2015.

As such, within the scope of IEEE RAS standards, the activity proposes to adopt ontological frameworks, for autonomous systems and robots, its semantic maps, reasoning, interactions to be performed in real scenarios, in any given operating environment.

The stated three IEEE WGs (1872.3, 3140, 1872.1.1) will fill the gap on these series of IEEE 1872 ontology driven standards.

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

Yes, I act as the Chair of a working group for developing a new standard titled: IEEE WG 1872.3 – Standard for Ontology Reasoning on Multiple Robots

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

Yes, the fellowship results in a final deliverable related to the ontology reasoning on multiple robots (WG1872.3). In addition, I draft contributions to the three standards that are being developed (IEEE P1872.3, IEEE 1872.1.1, and IEEE 3140).

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

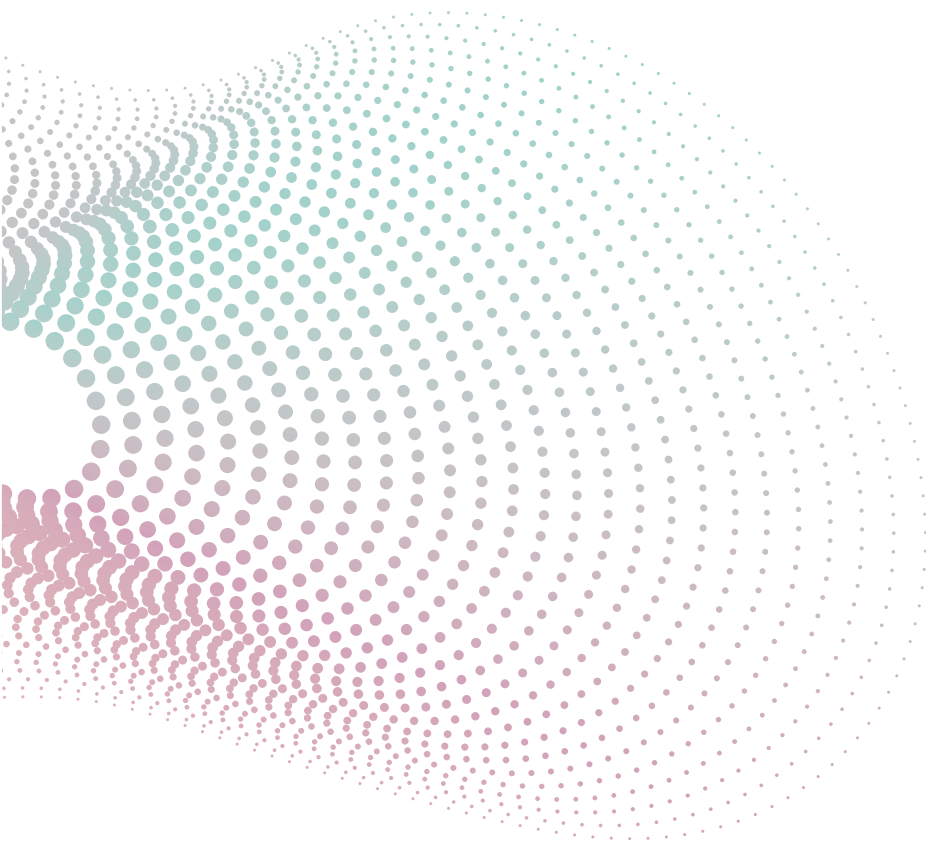
The main efforts of this activity are all in good process. My fellowship contributes to develop work towards standardisation of ontology reasoning (within WG 1872.3) in several robotic domains: affordances in human robot interaction; trust and security for autonomous robotics; artificial intelligence and machine learning for autonomous robots; multiple autonomous robots and cloud robotics. The second and third efforts, in the next two WGs: 3140, 1872.1.1, tackle semantic maps and the needed application examples and tutorials for proper deployment of the standards.

Online references related to the fellowship work

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

 <https://standards.ieee.org/ieee/3140.2/11547/>

 <https://standards.ieee.org/ieee/1872.1.1/11500/>





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