StandICT.eu 2023

ICT STANDARDISATION OBSERVATORY AND SUPPORT FACILITY IN EUROPE

FOLLOWING THE FELLOWS

IMPACT REPORT FROM FUNDED APPLICANTS TO THE STANDICT.EU 2023 FELLOWSHIP PROGRAMME

SIXTH OPEN CALL

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About StandICT.eu

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StandICT.eu 2023 would also like to thank **Thomas Reibe, StandICT.eu 2023 Project Officer & Senior Expert at DG Connect European Commission, and Emilio Davila-Gonzalez, Head of ICT Standardisation sector at DG Connect leading Unit F3-Blockchain & Innovation** for their leadership and guidance.

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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. We warmly thank the TWG chairs guiding this work: **Lindsay Frost, Ismael Arribas, Matthias Pocs, Dimosthenis Kyriazis, Jeroen Broekhuijsen, Antonio Kung, Claude Baudoin, Joel Myers, Arkopaul Sarkar, Georgios Karagiannis, Brian McAuliffe and Fiona Delaney.**

Foreword

«Technical standards are of strategic importance. Europe's technological sovereignty, ability to reduce dependencies and protection of EU values will rely on our ability to be a global standard-setter». (Thierry Breton, European Commissioner for the Internal Market).

The European Green Deal & the New Industrial Strategy for Europe as well as the geopolitical environment call for a strong **EU presence in international Standardisation development**. 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 6th edition, proving a tangible testimony of the impact generated by European ICT experts working in collaboration with international Standardisation Developing Organisations, thanks to the financial support provided through the *StandICT.eu 2023 Fellowship Programme,* as paramount part of the broader mission of the StandICT.eu 2023 Coordination and Support Action, funded by the European Commission's H2020 Framework Programme.

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). The activities carried out by the Fellows are likewise relevant to anticipate upcoming Standardisation priorities to be taken into account to devise future policies, to single out future Standardisation needs, and to advise on how to better interweave academia and research with Standardisation.

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 as a result of the ICT Standardisation efforts. As the EU Strategy on Standardisation [1] outlines, standards are a vital tool to valorise research result, standards:

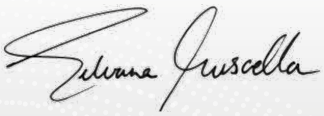
- Help researchers to bring faster their innovation to the market and spread technological advances by making their results transparent and ensuring high quality.
- Ensure confidence for consumers about safety of innovation.
- Increase the resilience of the European economy.
- Enable the next generation of ICT Standardisation experts.
- Improve the governance and integrity of the European Standardisation system.
- Allow technologies and materials to be interoperable.

Special thanks in putting together this booklet go to External Advisory Group who provide high-level input to fine-tune the topics covered by the Open Calls, as well as the dedicated work of our External Pool of Evaluators who scrupulously vet the numerous applications received in response to this call, to our Partners, Dublin City University and AUSTRALO Marketing Lab key to the monitoring activities, our project officers at the European Commission of DG Connect for their relentless support and, of course, to our fellows for the strenuous months of work behind each activity and reporting to help deliver the results herein.

Silvana Muscella

CEO, Trust-IT Srl

StandICT.eu 2023 Project Coordinator



1 https://ec.europa.eu/docsroom/documents/48598

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Introduction

This report provides an immersion to outcomes of the StandICT.eu 2023 Open Call #6 from the perspective of fellows that were selected and funded under this call. Our team is delighted to showcase the sixth series of StandICT.eu 2023 success stories of the funded fellowships 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, 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 theinteroperability of products and services, reduce costs, improve safety, and foster innovation.

At the same time Standards act as a powerful driver for Innovation and Growth by helping researchers bring their innovation to the market and spread technological advances by making their results transparent and ensuring high quality. One of the key-purposes of StandICT.eu 2023 is to support the activity of European ICT experts to contribute to the modernisation and consolidation of the European Standardisation system as well as to the valorisation of their research outputs, with a view to efficiently respond to the EU's ambitions towards the development of e-Agriculture policies, strategies and plans. Standards enable ICT innovation and ICT standards to advance sustainable agriculture, smart agriculture, and disaster-prevention which are key to preserve rural livelihoods and foster community resilience; topics that were at the focus of the announcement of the 6th 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 sixth one of a series from 9 StandICT.eu 2023 Open Calls, and each call will have a dedicated impact report with the goal to share the timely key findings, contributions, and observations with StandICT.eu community, the European Commission, the Multi-Stakeholder Platform, the SDOs, and even beyond with all interested actors of our ever-growing StandICT.eu 2023 community.

In this report, the Open Call #6 is presented with key takeaways and figures, then the fellowship outcomes are presented in the targeted technology areas, as defined in the Rolling Plan for ICT Standardisation[1], addressed by the 39 funded Fellows:

- **Key Enablers and Security** (24 fellowships), including fellowships on *Cybersecurity* (8 fellowships), *Artificial Intelligence* (6), *5G* (2), *Quantum Technology* (1), *Semantic Interoperability* (2), *Smart Grids and Smart Metering* (2), *ePrivacy* (1), *EMC Radiation* (1)
- **Sustainable Growth** (5 fellowships) covering *Intelligent Transport Systems* (1), *Industry 4.0* (1), *Circular Economy* (2), *Building trust* (1)
- **Innovation for Digital Single Market** (6 fellowships) focusing on *Blockchain and DLT* (5) and *Identity Management and Anonymisation* (1)
- **Societal Challenges** (4 fellowships) having fellowships on *Justice* (1), *eHealth* (1), and *Accessibility of ICT* (2).

1 www.standict.eu/publications/rolling-plan-ict-standardisation-2022-european-commission

Overview of the Open Call #6

The sixth StandICT.eu 2023 Open Call was launched on the 24h of November 2021 and closed on the 24th of January 2022. 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.

This Open Call identified "Food, bioeconomy, natural resources, agriculture and environment"[2] as its leading theme. The development of open technical specifications and standards that aim to represent European values and ethics, strengthen the take-up, scalability cross-border and cross-sector interoperability of their technological solutions, as well as decreasing the costs of technical due diligence on the private and public procurers. This will boost sustainable and smart agriculture, making this sector more sustainable, more efficient, smarter, safer, and more resilient.

The Open Call was however completely open for applications tackling a broad range of ICT domains (as encompassed in the ICT Rolling Plan for Standardisation) and treated as equally valid.

Fellowship Profiles

This sixth fifth Open Call totalled 59 eligible applications received out of which 40 have been selected for funding, with an overall 351,000 Euro granted. One fellowship was withdrawn due the exceeded limit of the accumulated funding ceiling (60K€ for a fellow in the entire StandICT.eu 2023 Fellowship Program).

2 https://research-and-innovation.ec.europa.eu/funding/funding-opportunities/funding-programmes-and-open-calls/horizon-europe/cluster-6-food-bioeconomy-natural-resources-agriculture-and-environment_en

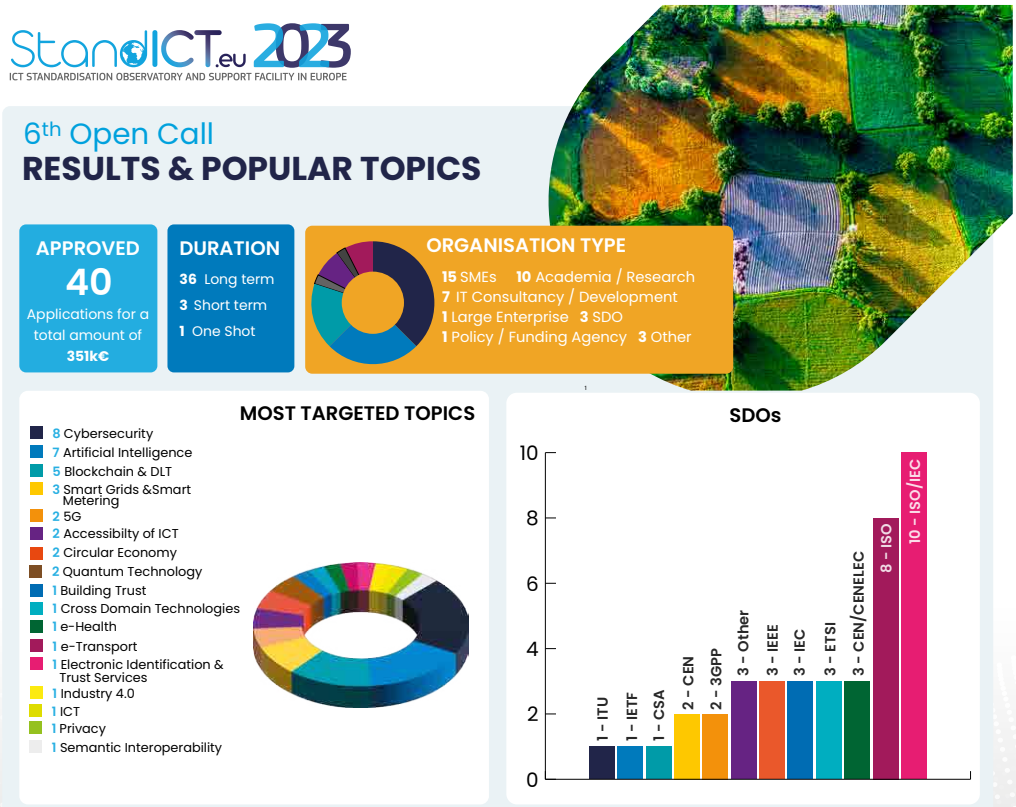


Figure 1 - StandICT.eu 2023 OC#6 Results snapshot

Once more, this Open call confirmed the excellent high quality of most of the submitted proposals, marking a noticeably high average quality score (the minimum threshold to access funding was 6,90 score in a 1 to 10 scoring scale). The funded applications provided an extensive geographical coverage with 13 different EU or associated countries represented with a satisfying balance across the key technologies of the sixth Open Call, and with a wide spectrum of SDOs that will benefit of the competence and expertise of the applicants.

As outlined in Figure 1, major part of the granted fellows has chosen their focus in Key Enablers and Security, in trending areas as Cybersecurity, Artificial Intelligence, 5G and Blockchain. It is noteworthy to point out that several fellowships tackled circular economy, semantical interoperability and Smart Girds and Metering.

Engaged SDOs, Organisations and European Projects

61% of the fellows' activity contribute to the activities of Committees or Working Groups operating in global SDOs, namely in ISO, IEC, ISO/IEC, ITU, IEEE, IETF, while the remainder works with European Standardisation Organisations (ESOs), namely in ETSI, CEN, CEN/CENELEC, and other groups/initiatives engaged in standardisation (notably 3GPP and EITCI). One of the most evident benefits that SDOs can take advantage of is the wide and solid know-how of the funded experts that can be instrumental to achieve a better understanding of standards (and their underlying design), trade-off and compromising during the development process, and the operating conditions and environments they are intended to serve. Moreover, SDOs can leverage the expertise of the fellows in view of building consensus within key areas of technology.

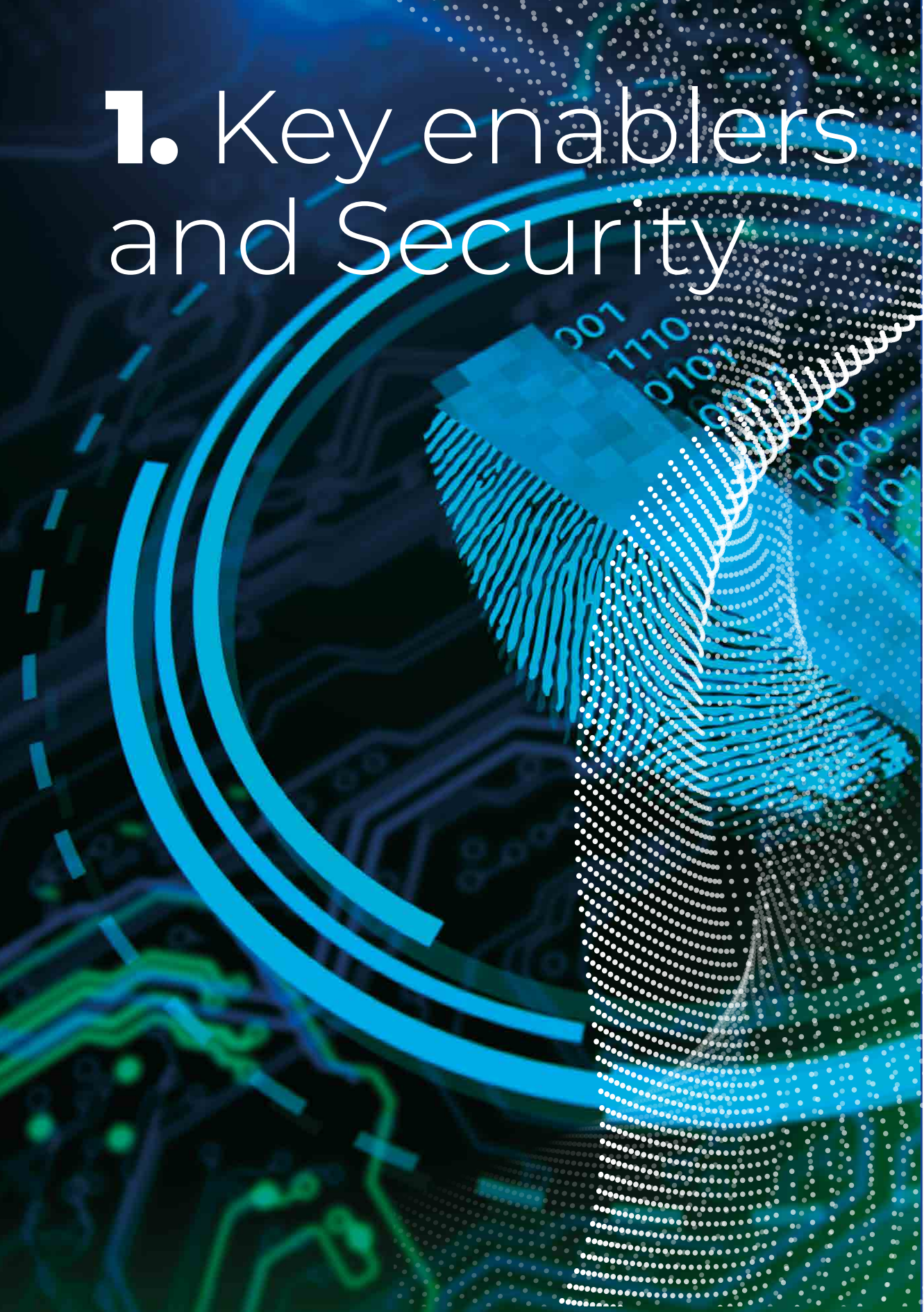
Finally, 5 European funded research projects (see Table 1) are strictly related to the engaged work in the OC#6 fellowships, with a focus on different vertical technologies.

Table 1 Related EU Projects

Research Project	Grant Programme	Domain	Hyperlink	OC#6 Fellow
OttCT	NGI Trublo	Blockchain	www.trublo.eu/OttCT	Dimitar Kyosev
InterConnect	Horizon2020	IoT, Semantic Inter-operability	interconnectproject.eu	Amélie Gyrard
NGI ESSIF-Lab	Horizon2020	Self-Sovereign Identity	www.ngi.eu/ngi-projects/essif-lab	Jan Lindquist
NGI Trublo	Horizon2020	Trusted Information	www.trublo.eu	Leandro Navarro
SHERPA	Horizon2020	Smart Information Systems	www.project-sherpa.eu	Nikita Lukianets

Now, we are delighted to share with you the insights from our granted fellows' work – and we truly hope that these results encourage you to follow even more closely all activities that the StandICT.eu 2023 initiative leads in the Fellowship Programme but also on the European Observatory for ICT Standards (EUOS, www.standict.eu/euos) - via the Technical Working Groups (TWGs) delivering up-to-date landscape and gap analysis (www.standict.eu/landscape-analysis-reports) and policy recommendations to help shaping together and reinforcing the European and international ICT standardisation arena.

1. Key enablers and Security



AI Standardization Roadmapping

Patrick Bezombes
Independent Expert
France

Sector

Artificial Intelligence

Engaged SDOs, WGs and TCs

CEN-CENELEC/JTC 21/WG 1 Strategic Advisory Group
ISO-IEC/SC 42/AG 3 AI standardization Road-mapping

Role

Vice-chair CEN-CENELEC JTC 21 Artificial Intelligence

Co-chair CEN-CENELEC Workshop on Digital Sovereignty

Convenor CEN-CENELEC JTC 21 SAG (Strategic Advisory Group)

Convenor ISO-IEC/SC 42/AG 3 AI standardization roadmapping

Addressed EU standardisation priorities and gaps

The major issue with the SC 42 standardization landscape (and SDOs standardization landscape on AI in general) is that very few people, if any, really understand the relationship between all standards and what they really cover.

Within my work groups, we have developed a standardization matrix table allowing to understand what topics are covered within each standard. This standardization matrix will be proposed to JTC 21. Therefore, it will be possible to visualize on a single spreadsheet all the standardization activities related to AI within JTC 21 and SC 42.

Following the work being done within AG 3, a couple of gaps have been identified and have led to the launch of activities regarding “AI level of specifications” and “Conformity assessment”. A task force has been set up within AG 3 on “Conformity assessment” to identify what should be the future standards to be developed.

Within JTC 21/SAG, 2 new AHGs have been set up to address the gaps that are foreseen with the arrival of the draft standardization request supporting the AI Act. Those AHGs cover respectively “AI Risk” and “Trustworthiness characteristics for AI”.

Concerned ICT Standards and contribution to the related landscape

My fellowship supports the development of the ISO-IEC/SC 42 and CEN-CENELEC/JTC 21 standardisation landscape framework and allows not only to map the standardisation activities but also to identify potential gaps. For example, one gap that has been identified in the actual work is that there is very little technical specifications in some areas. Therefore, conformity assessment will not be possible in some cases.

Impact (on European SMEs, related project or in the society)

Impact on SMEs

CEN/CENELEC JTC 21 is going to develop and adopt, standards in support of the future European regulation (AI Act). The European Commission intends to send a standardisation request by the end of 2022. One of the aims of the JTC 21 is to provide standards that are

innovation-friendly and actionable, with in mind the impact of the future standards on European SMEs. Therefore, by selecting a proper standardisation roadmap, and even identifying gaps, the contribution will support European SMEs.

Impact on Society

The roadmapping activities support indirectly societal concerns. Topics like non-discrimination (Un-biased AI) or Subliminal Manipulation (AI-enhanced nudging) are being addressed in SC 42 and in JTC 21, while Environmental AI sustainability is started to be considered in SC 42/AG 3 and may lead to a New Work Item Proposal.

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

This fellowship work has led to the set-up of 2 JTC 21/AHGs (AHG 7 and AHG 8) on AI risk and Trustworthiness characteristics for AI. Those two groups are preparing New Work Item Proposal to support the future EU regulation. In addition, a task force has been created within SC 42/AG 3 to identify gaps on Conformity Assessment issues.

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

Yes, this fellowship has result in a technical report offering recommendations for new/revised standards.

What future efforts or activity are still necessary in your area of application?

I suggest continuing the engaged work as the AI standardisation road-mapping activities are essential, not only to give visibility and coverage, but also to align with the future Standardisation Request from the European Commission. Furthermore, with the swift development of new standards, it is important to keep updating the standardisation landscape at SC 42 and JTC 21 levels.

Online references related to the fellowship work

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

www.iso.org/committee/6794475.html

Membership at CT ISO/IEC JTC 1/SC 42 AI by UNE

Ramiro Bueno Martínez
Committee member UNE / COITT
Spain

Sector

Artificial Intelligence

Engaged SDOs, WGs and TCs

ISO/IEC JTC 1/SC 42 Artificial Intelligence JWG 1 Foundational standards
ISO/IEC JTC 1/SC 42 JWG 3 Trustworthiness
ISO/IEC JTC 1/SC 42 JWG 4 Use cases and applications

Role

Member

Addressed EU standardisation priorities and gaps

As Engineer, Consultant and Researcher, I provide support to technical issues and working methods. As part of this fellowship, my aim is to make more consistent the technical specifications and technical reports related to the controllability of AI systems with an important impact in other societal concerns such as the trustworthiness and liability of public administrations, producers of manufacturers of technology over consumers and final clients.

Concerned ICT Standards and contribution to the related landscape

Through this fellowship, I participated in several work groups where I attended regularly during the last 6 months in quality of member, providing technical support to the generated documentation and making technical contributions some of this standardisation projects, are the ICT Standards:

- ISO/IEC 23894 - Risk Management AI systems
- ISO/IEC TS 8200 – Controllability of automated AI systems (Expert)
- ISO/IEC TS 5471 - Quality evaluation guidelines for AI systems
- ISO/IEC AWI TR 5469 - Functional safety and AI systems
- ISO/IEC AWI 5339 - Artificial Intelligence — Guidelines for AI applications
- ISO/IEC CD 5338 -Artificial intelligence — AI system life cycle processes

Impact (on European SMEs, related project or in the society)

Impact on SMEs

I am experienced in providing technical contributions developed into working groups such as TS-8200 of Controllability of automated AI systems in aspects related with the liability of producers and manufacturers of technology. With this fellowship, I joined the application of principles, processes and methods related with the improvement of quality models of the Artificial Intelligence through the standardisation within my engaged WGs. Also, I am a member of the European Digital SME Alliance where I contribute to the WG Smart Communities and ICT Sustainability. Before, I was trying to develop the impact of the technical contributions developed into working groups such as TS-8200 of Controllability of

automated AI systems in aspects related with the liability of producers and manufacturers of technology. Joining to the application of principles, processes and methods related with the improvement of quality models of the Artificial Intelligence through the standardisation within this working-groups, also I am a member of the Digital Platform European Digital SME Alliance attending periodically to the working-meetings of the WG Smart Communities and ICT Sustainability, where are trying to develop and implement initiatives as the 'Right To Repair' with an important societal and environmental impact over digital markets. I am trying to introduce concepts related with the sustainability and circular economy, in any of this working-groups where actually I am making some technical comment and contributions over the final standardisation documents.

Furthermore, in all WGs where I contribute, my aim is to introduce concepts related with the sustainability and circular economy in my technical comments for new and revised standards.

Impact on Society

Namely, my fellowship contributed to the ISO/IEC TR 24368 that addresses an overview of ethical and societal concerns, related with Bias and Fairness of the AI ML-Algorithms such as TR 24027 Bias in AI systems.

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

Yes - I work at the Spanish National Body of Standardisation UNE that will be a part of the CEN/CENELEC team developing a standardisation project on "Harmonization of Artificial Intelligence Technology" (SRAHG Artificial Intelligence).

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

Yes, I have contributed to several technical reports on new / revised standards.

What future efforts or activity are still necessary in your area of application?

Additional EU experts are needed to better support the EU position. The digital markets are very complex, and the legislation, rules and normative are different with respect to other countries. The engaged Standardisation works must be aligned with the Directives and Recommendations of the countries and also of the EU, for this reason it is important, not only to develop international standards but also harmonise the standards to digital markets, such as the EU Digital Single Market.

Online references related to the fellowship work

www.iso.org/committee/6794475.html

Standardization work about AI trustworthiness: Ethics and Societal Concerns. AI Quality Assurance

Ramiro Bueno Martínez
Expert UNE, CTN 71 SC 42 IA & Big Data UNE / COITT
Spain

Sector

Artificial Intelligence

Engaged SDOs, WGs and TCs

ISO/IEC JTC 1/SC 42 WG4 AI Use Cases and Guidelines.
ISO/IEC JTC 1/SC 42/WG3 Trustworthiness

Role

Member

Addressed EU standardisation priorities and gaps

To provide an effective answer to the challenges related with the social adoption of the AI standards in areas such as trustworthiness, the ISO-IEC JTC 1 SC 42, where I contribute as part of this fellowship, is working in different technical projects related with:

- The civil liability and the adapting standard rules of artificial intelligence and their quality assurance and sustainability, such as the project ISO-IEC 25059 – Systems and software Quality Requirements and Evaluation.
- The Ethical and legal requirements, addressed through the project ISO/IEC TR 24368 Overview of ethical and societal concerns.
- UNESCO's recommendation on the ethics of Artificial intelligence to save societal GAPs related with the Artificial Intelligence through the project ISO/JTC 1/SC 42/Roadmapping AHG.
- Guidelines and identification of possible cases of use related with the mobility and transport (Self-Driving Vehicles), energy (Energy system infrastructure) or Societal concerns related with sustainable goal such as climate action, through the Project ISO/IEC JTC 1/SC 42/WG 4.

Concerned ICT Standards and contribution to the related landscape

This fellowship focuses on the following standards:

- ISO/IEC TR 24368 - Ethics and Societal Concerns
- ISO/IEC 42001 – AI Management Systems [AIMS]
- ISO/IEC 23894 – AI Risk Management
- ISO/IEC TR 24027 – Bias in AI Systems
- ISO/IEC 38507 - AI Governance in organizations
- ISO/IEC 25059 - [SQuRE] Software Requirements Quality model AI
- ISO/IEC TS 5471 - Quality evaluation guidelines for AI systems

Impact (on European SMEs, related project or in the society)

Impact on Society

The correct use of Artificial Intelligence can help us to address different problems related with the Carbon Footprint reduction with AI, such us:

- Optimising natural resources.
- Using waste heat in the district heating network.
- Development of Green 6G Infrastructures.

But also, Quantifying the impact, KPIs, SDGs, in aspects such as:

- Carbon footprint measurement.
- Measures of efficiency.

Joining to these issues, aspects related with the Quality Assurance of AI Systems must being in count to calculate the impact of the Artificial Intelligence, in aspects related with Circular Economy such us Usability, Recycling, Repairing, Reusing, Re-manufacturing, or Refurbish of Machines and AI Systems and the standardisation and regularisation of use cases.

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

Yes, in the future. My organisation, the Spanish National Body of Standardization (UNE), was invited to be a part of the team of CEN/CENELEC developing a standardisation project of harmonization of Artificial Intelligence Technology (SRAHG Artificial Intelligence).

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

Yes, I have contributed to technical specification and on a technical report on common terminology.

What future efforts or activity are still necessary in your area of application?

The AI standards are getting mature, but I would recommend more European experts to get engaged in the adoption and harmonisation of these towards the EU digital single market. This would help to make the EU position stronger in the international context.

Online references related to the fellowship work

www.iso.org/committee/6794475.html

Implementation of Artificial Intelligence based compression standard for 3D graphics

Marius Preda
Associate professor, Telecom SudParis - Institut Mines Telecom France

Sector

Artificial Intelligence

Engaged SDOs, WGs and TCs

ISO/IEC JTC 1/SC 29/WG 7 MPEG 3D Graphics Coding

Role

Convenor of ISO/IEC JTC 1 SC 29/WG 7

Addressed EU standardisation priorities and gaps

This fellowship activity is performed within the MPEG 3DGH WG and has two objectives. Firstly, it investigates the potential value of AI based technologies for 3D graphics compression and, secondly, it prepares a methodology for a potential Call for Proposal, including the generation of several draft documents.

My fellowship project includes two aspects, a business, and a technical analysis. The priority was to identify the use cases, the associated datasets, and the business requirements. Considering existing and rich neural network eco systems, AI-based solutions have great potential to be used for compression of graphics content. An initial list of use cases where AI-based graphics coding appears to be useful includes (1) VR/AR for entertainment and industry, (2) terrestrial/aerial scanning market, (3) LiDAR sweep and related sensors compression for automotive or robotics, (4) HD Map for navigation and (5) 3D scanning for part inspection (defect detection) and reverse engineering.

In terms of business requirements, the challenges are related to the definition of key functionalities the standard should address human visualisation (as for VR, AR), machine understanding (as in automotive) or hybrid (consumed by human and machine). Additionally, it is essential to identify proper datasets to facilitate the training and validation of AI-based graphics compression solutions and a study was initiated to address this challenge.

For the technical analysis, the following aspects were addressed, to be considered when developing the standard: (1) Model Architecture, (2) Dataset choices, (3) Test Conditions and Complexity Reporting, (4) Metrics, (5) Crosscheck Methodologies.

Concerned ICT Standards and contribution to the related landscape

As the convenor of WG 7 MPEG 3DGH, following some exchanges with representatives from the industry and academia, I decided to create in July 2021 (before this fellowship project started) an AhG on « AI based 3D graphics coding ». Since then, WG 7 released several output documents to conduct the exploration of AI technologies for 3D graphics compression. At the date when this fellowship project started (May 1st, 2022), the exploration activity for a new AI standard in WG 7 was active but still in an exploratory phase. This project contributed to reinforce and structure the activity. In two consecutive WG meetings, several aspects were discussed related to the complexity of AI based encoders, entropy coding with AI techniques, anchors selection, training strategies, AI frameworks, datasets for training, results reproducibility, normative vs non-normative aspects, etc. The outcome of the sessions was

the decision to continue the standardisation work and to issue a set of 4 output documents structuring the activity: N373 - Guidelines for conducting AI exploration experiments for PCC, N374 - Performance analysis of currently AI-based available solutions for PCC, N-375 Preliminary data set collection for AI experiments. The documents were further refined in October, producing 3 new versions: N431, N432 and N433 respectively. Five directions for further development were decided as a consequence of these meetings: (1) AI tools for PC compression and analysis, (2) Deep Octree Coding, (3) End-to end AI PC Coding (renamed in October "Deep feature based PC Coding" and (4) AI-based Dynamic PC Coding and (5) AI-based attribute coding.

Impact (on European SMEs, related project or in the society)

Impact on SMEs

There are several European SME involved in WG 7 and few of them are participating to AI-based compression for 3D graphics.

Impact on Society

Data compression is in general a technology impacting the global energy consumption for network equipment. The work performed in this fellowship contributes to this societal impact by addressing the specific field of 3D graphics content.

Moreover, while Europe starts to have a strong technological agenda in terms of AI development, it is still far beyond US and China in terms of number of publications and patents in the field. By actively contributing to initial phases of standardisation for 3D graphics compression using IA, European actors may reduce the gap and better defend their vision as well as scientific and economic interests.

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

Yes - WG 7 issued several recommendations to advance the work on AI-based compression for 3D graphics (issued in July and October 2022) and supported by National Bodies involved in ISO/IEC SC 29. And there is a strong interest from several National Bodies to proceed with the standardisation of AI technologies for graphics compression.

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

Yes, my fellowship has resulted in several technical reports on recommendations for new / revised standard, on development of a new standard, on Reference Data and on Reference Material.

What future efforts or activity are still necessary in your area of application?

I suggest continuing the engaged efforts; the work performed allowed to advance the activity in WG 7 related to AI technologies for 3D graphics compression. The status with WG 7 is exploratory but there is a strong agreement in the group to proceed with a CfP in 2023. By continuing this action, the proponent can maintain a high level of involvement and guide the group in creating a solid and well documented CfP and to supervise the analysis of the technologies proposed resulting the CfP.

Online references related to the fellowship work

https://mpeg.expert

www.mpeg.org/structure/coding-of-3d-graphics

DITAI - Disclosure Identity for the Transparency of Artificial Intelligence Systems

Nikita Lukianets
Founder, Researcher, the Open Ethics Initiative
France

Sector

Artificial Intelligence

Engaged SDOs, WGs and TCs

IETF ART - Applications and Real-Time Area
IETF SEC - Security Area
IRTF HRPC - Human Rights Protocol Considerations Research Group

Role

Member

Addressed EU standardisation priorities and gaps

My fellowship aims to develop specifications that could serve as a standard of the disclosure identity. Bringing such standards to life will allow users of autonomous systems to easily distinguish disclosures, check disclosures, or send for validation to third-party providers without having to deal with the disclosure information directly. From the ecosystem perspective, the identity standards allow disclosure providers to function together and not in a silo, acting as a key step in the conformity assessment process for high-risk AI systems. Conformity assessment requirement was outlined by the EU Artificial Intelligence Act[3]. The role and place of the conformity assessment for the high-risk AI systems are illustrated in the diagram below, as published in my discussion for the AI Futurium.

Specifically, this fellowship focuses on the identified gap in the I-D for the Open Ethics Transparency Protocol where collected feedback indicated the need for a distributed approach to the issuance and storage of the disclosures. A distributed approach allows to avoid harmful concentration of power in the "hands" of a single disclosure provider or an auditor. This, in turn, allows the creation of the market for disclosure processing, thus facilitating transparency and democratising compliance procedures beyond high-risk applications, as required in the EU AI Act.

Concerned ICT Standards and contribution to the related landscape

My fellowship deals with the challenges related to self-disclosure and methods of formal disclosure verification for AI-powered systems, contributing to the overall predictability of AI systems deployed in production environments. The related standards and working groups are:

- Securing Artificial Intelligence (SAI) Data Supply Chain Security,
- ETSI DGR/SAI-002 The standard for Machine Readable Personal Privacy Terms,
- IEEE P7012Information Technology — Artificial Intelligence — Risk Management, ISO/IEC CD 23894.2 Artificial intelligence — Functional safety and AI systems, ISO/IEC AWI TR 5469.

Recent works also relate to The Ethically Aligned Design framework, which becomes practically realizable with disclosures https://ethicsinaction.ieee.org/

3 https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52021PC0206

Impact (on European SMEs, related project or in the society)

Impact on SME

The open nature of the Open Ethics Transparency Protocol suggests a decentralised system for identity management that can protect from the monopolisation of the trust and identity space, attracting federated identity providers to join the Disclosure network.

The proposed work brings the practical application of the decentralization feature with extended aliases for disclosure providers.

Impact on Society

The standardisation of the disclosure identity is required enhance the AI audit (and autonomous systems from a broader perspective). These processes are very fragmented, and the landscape of AI Ethics regulation is scattered across more than 90 different national, corporate, and international frameworks. My contributions allow bridging multiple disclosure approaches together to allow presenting information on AI Ethics of the systems in a standardised and explicit way.

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

Yes, I have contributed to the new IANA URI scheme for Disclosure of AI systems for the Open Ethics Transparency Protocol.

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

Yes, I have worked on Technical Specifications and on a Technical Report on recommendations for new / revised standards.

What future efforts or activity are still necessary in your area of application?

Actions are required on bringing further the decentralisation efforts and in formalising the approaches to the conformity assessment. Right now, the existing legislative proposals are vague and focus on WHATs. We should go further, and deepen the conversations about HOWs is needed.

Online references related to the fellowship work

- https://github.com/OpenEthicsAI/OETP-RI-scheme
- Lukianets, Nikita. (2022). OpenEthicsAI/OETP-RI-scheme: Resource Identifier Scheme for OETP (v0.1.0-alpha). Zenodo. https://doi.org/10.5281/zenodo.6945960
- https://datatracker.ietf.org/group/art/about/
- https://datatracker.ietf.org/group/sec/about/
- https://irtf.org/hrpc

Artificial Intelligence Standardization Awareness Programme in Portugal

Isabel Caetano

President of the Portuguese Technical Committee for AI - Head of Delegation, IPQ

Portugal

Sector

Artificial Intelligence

Engaged SDOs, WGs and TCs

ISO TC 279 – WG 1 Innovation Management Systems
ISO/IEC JTC 1/SC 42 Artificial Intelligence
CEN/CLC/JTC 21 Artificial Intelligence /W2

Role

Head of the Portuguese delegation to ISO TC279, ISO/IEC JTC1/SC42 and CEN/CENELEC JTC21

Addressed EU standardisation priorities and gaps

My fellowship addresses mainly SME lack of awareness concerning AI Standardisation developments and the requirements being developed that must be considered in new AI based products or services, according to risk levels, sectors, or types of activities.

Concerned ICT Standards and contribution to the related landscape

This fellowship has enabled me to follow and participate in CEN and ISO Technical Committees for AI and Innovation Management. At the same time, an overall state of the art activity has taken in consideration standards already published or under development, such as:

- ISO/IEC TR 24027:2021 Information technology — Artificial intelligence (AI) — Bias in AI systems and AI aided decision making.
- ISO/IEC TR 24028:2020Information technology — Artificial intelligence — Overview of trustworthiness in artificial intelligence.
- ISO/IEC TR 24029-1:2021 Artificial Intelligence (AI) — Assessment of the robustness of neural networks — Part 1: Overview.
- ISO/IEC TR 24029-2:2021 Artificial Intelligence (AI) — Assessment of the robustness of neural networks — Part 2: Overview Methodology for the use of formal methods.
- ISO/IEC TR 24372:2021 Information technology — Artificial intelligence (AI) — Overview of computational approaches for AI systems.
- ISO/IEC 38507:2022 Information technology — Governance of IT — Governance implications of the use of artificial intelligence by organizations.
- ISO/IEC 42001 Information technology — Artificial intelligence — Management system.
- VDE SPEC 90012 V1.0 (en) VCIO based description of systems for AI trustworthiness characterisation.
- IEEE P7000-2021™ - Standard for Model Process for Addressing Ethical Concerns During System Design.
- IEEE P7001-2021™ - Standards for Transparency of Autonomous Systems.

- IEEE 7010-2020™ - IEEE Recommended Practice for Assessing the Impact of Autonomous and Intelligent Systems on Human Wellbeing.

Impact (on European SMEs, related project or in the society)

Impact on SMEs

SME are the main source of job creation globally and in Portugal they represent more than 99% of the total number of companies. The importance of technologies such as blockchain and AI to their transformation and competitiveness bring new challenges and requires multistakeholder approaches. The activities being developed in the Portuguese landscape aim to create awareness about AI Standardisation developments and the new regulation framework through the implementation of EU AI Act. The main objective of my contribution was to outreach to Portuguese business sector, opening new opportunities for their participation in the standardisation activities and stimulating public organisations to support this effort. With more than 70 registered participants, the first two webinars, organized in October 2022, focused Metaverse and AI standardisation developments, especially in ISO, CEN-CENELEC and IEEE.

Impact on Society

My work has been focused on the development of synergies with the public organisations that support national research and business communities in the R&D and innovation domains. Its societal impact is related to a broader outreach of the ethical dimensions of AI and the launch of the mirror committee for AI in Portugal.

What future efforts or activity are still necessary in your area of application?

Stakeholders' engagement in standardisation activities require time to create awareness about the value proposition and to build trust between different target groups and types of organisations. For that purpose, the development of technical specifications and standards in AI requires a strong commitment to stimulate the AI community (e.g., researchers, businesses, start-ups, end users) to participate in the standardisation activities and to fully understand the role they can play as well as the purpose and the scope of several documents. My fellowship was an enabler to create awareness about AI standardisation developments in Portugal but, in parallel to the launch of several consortia, financed by the Resilience and Recovery Plan, there is an opportunity to engage these organizations to identify critical issues for standardisation development and to test or pilot some preliminary approaches.

A Portuguese informal network of organisations, including the National Innovation Agency – ANI and the National Standardisation Body – IPQ, and the business association – itSMF promoting, – Chair of the Technical Committee, was launched. A preliminary plan of activities for 2023 could be stimulated with additional support from StandICT.eu.

Online references related to the fellowship work

www.unido.org/sites/default/files/files/2022-07/Program_UNIDO_ISO.pdf

www.ani.pt/pt/noticias/not%C3%ADcias-ani/ani-promove-debates-dedicados-%C3%A0-intelig%C3%AAncia-artificial/

Metrology for Emerging Electromagnetic Compatibility Standards

Marco Azpúrua
CISPR Expert, Universitat Politècnica de Catalunya
Spain

Sector

EMC Radiation

Engaged SDOs, WGs and TCs

IEC

IEC CISPR/CIS/B/WG 1 Industrial, scientific and medical (I.S.M.) radio frequency apparatus
IEC CISPR/CIS/B/WG 7 ISM equipment - Measurements in situ and measurements of large size/high power equipment

Role

Member

Addressed EU standardisation priorities and gaps

My fellowship tackles the following gaps and challenges:

- Absence of an appropriate EMC testing method for assessing electromagnetic emissions of large size and high-power equipment that cannot be tested on a standardized test site.
- Associate technical challenges of EMI measurements in uncontrolled electromagnetic environments.
- Definition on specifications for alternative measurement instruments that would allow for time-domain EMI measurements using the direct sampling approach.
- Creating a reference test method for EMI measurements in-situ and at defined sites, a completely new and controversial concept for the EMC standpoint.
- Insufficient coverage in the EMC standards about testing methods and requirements for controlling interferences produced by PV systems are producing a significant increase on the electromagnetic noise and reported incidents of interference on safety critical and defence critical communication bands.

Concerned ICT Standards and contribution to the related landscape

My fellowship contributes to the development of some ground-breaking EMC testing standards that will be applicable for large size and high-power equipment. Examples of such voluminous electrical systems are PV inverters, MRI systems, automatic storage systems, or even industrial robots.

Many of these systems cannot be tested in standard EMC laboratories due to size or power requirements. Therefore, there is a standardisation gap for some manufacturers to demonstrate compliance with the EMC Directive because of the lack of suitable testing methodologies applicable for on-site or at defined sites. I am also promoting time-domain measurement methodologies as an alternative for addressing the challenges of emissions measurement performed in the uncontrolled conditions found outside the EMC test chambers and the redefinition of some interference detectors to be capable of a more accurate determination of the likely degradation suffered in wireless communications due to EMI.

The specific standards that I am contributing directly are:

- CISPR 37 ED1. Industrial, scientific and medical equipment – Radio-frequency disturbance characteristics – Limits and methods for measurements in situ and at defined sites. (New standard)
- CISPR 11:2015. Industrial, scientific and medical equipment - Radio-frequency disturbance characteristics - Limits and methods of measurement. (Update of this standard)
- CISPR 16-1-1:2019. Specification for radio disturbance and immunity measuring apparatus and methods - Part 1-1: Radio disturbance and immunity measuring apparatus - Measuring apparatus. (Update of this standard)

More recently, contacts have been started to extend some of the new methodologies developed for the standards above into, more specific product standards that are focused on PV systems (IEC 62920:2017) and wind energy generation systems (IEC 61400-40).

Impact (on European SMEs, related project or in the society)

Impact on SMEs

I can refer to two specific impact areas. First, there are EMC specialised consultancy companies, many of them could be classified as SME. Those EMC related SMEs will be able to grow through new types of testing services when alternative procedures for demonstrating compliance with the EMC directive are in rule. This will allow for a completely new business area. I can affirm this from my own experience since I am the founder of a company in this sector (EMC BARCELONA). Many of our clients in Catalonia and Spain are willing to have their products tested on-site or at a defined site.

Impact on Society

This fellowship contributes to:

- The conservation and management of the radio spectrum through the control of unwanted man-made interferences.
- Enabling EMC compliant renewable energy systems.

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

Yes, to CISPR 37 ED1. Industrial, scientific and medical equipment – Radio-frequency disturbance characteristics – Limits and methods for measurements in situ and at defined sites. This is a new standard.

What future efforts or activity are still necessary in your area of application?

I would strongly recommend continuing the engaged work. As she standards that I tackled are still under development; and there in interest of extending the new standard methods into product standards such as the following ones:

- IEC 62920. Photovoltaic power generating systems - EMC requirements and test methods for power conversion equipment.
- IEC 61400-40. Wind energy generation systems. Part 40. Electromagnetic Compatibility (EMC). Requirements and test methods.

Online references related to the fellowship work

www.iec.ch/dyn/www/f?p=103:7:7122641315371 24::::FSP_ORG_ID,FSP_LANG_ID:1412,25

https://scholar.google.es/citations?view_op=list_works&hl=es&user=TAS0rtwAAAAJ

Low-power Wake-up Radio in 5G

Sebastian Wagner
Standardization Engineer, EURECOM
France

Sector

5G

Engaged SDOs, WGs and TCs

3GPP TSG RAN WG1 (RAN1)

Role

I am attending 3GPP meetings as a delegate for EURECOM.

Addressed EU standardisation priorities and gaps

The Networld2020 report sees a significant amount of work necessary in the IoT sector to support the UN Sustainable Development Goals (SDGs):

"...some SDGs (i.e., 6, 7, 11, 13, 15) require mainly ubiquitous availability, energy efficiency and massive IoT service management. These SDGs are related for example to the deployment of vast numbers of IoT devices that collect information and improve the everyday life of citizens (e.g., water, quality, smart cities, improved management of power and energy etc.)."

It is the role of SDOs to provide standardised solutions to enable these future use cases. On the relation of IoT and 5G the report:

"IoT Relation and Impact on 5G: With the introduction of 5G, vertical industries will embrace digital transformation, to move beyond traditional service approaches, on an unprecedented scale. This will be a new engine for economic growth and social development. A core element of 5G IA/AIOTI cooperation will be identifying the key requirements imposed by vertical industry sectors to anticipate relevant trends in IoT use cases and apply the knowledge gained to define their impact on the 5G architecture and features."

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.

Concerned ICT Standards and contribution to the related landscape

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

A Low-Power Wake-up Radio (LP-WUR) is independent of the 5G main radio and designed to receive a wake-up signal (WUS). This allows the 5G MR to enter the newly defined ultra-deep sleep where it is almost turned off completely.

Impact (on European SMEs, related project or in the society)

Impact on SMEs

The standardisation of a LP-WUS in 3GPP will allow new IoT use cases because power consumption to maintain 5G connectivity is significantly reduced. Therefore, novel applications/devices with stringent low power requirements and 5G connectivity are possible.

Impact on Society

New low-power IoT device with 5G connectivity have a host of applications which may benefit society, such as sensors for water quality, smart cities, improved management of power and energy etc.

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

I am contributing to the 3GPP Rel-18 Study Item (SI) on Low-Power Wake-up Radio. During the last two meetings RAN1#110b-1 and RAN1#111, I have submitted 5 contributions with proposals and evaluation results. Those proposal 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.xxx will be ready in 2023.

What future efforts or activity are still necessary in your area of application?

Once the SI phase finishes, a possible Work Item (WI) phase will be discussed in RAN. The WI will then result in updated 3GPP specifications including LP-WUS.

Online references related to the fellowship work

www.researchgate.net/publication/360484816_Smart_Networks_in_the_context_of_NGI

www.3gpp.org/3gpp-groups/radio-access-networks-ran

Development of Matter for Smart Grid and Smart Metering

Robert Cragie
Standards Developer and Integrator, Gridmerge Ltd.
United Kingdom

Sector

Smart Grids and Smart Metering

Engaged SDOs, WGs and TCs

Connectivity Standards Alliance (CSA) Data Model WG, Matter WG, Product Security WG and Zigbee WG.

Role

Member of all groups, apart from Champion of Metering New Feature Request (NFR) in Marketing and Product Subgroup Energy Management Tiger Team.

Addressed EU standardisation priorities and gaps

Matter is a standard that has been recently developed under the Connectivity Standards Alliance (CSA) that aims to reduce fragmentation across different vendors and achieve interoperability among smart home devices and Internet of things (IoT) platforms from different providers. A significant number of the specification developers and implementers are based in the EU.

The initial application layer focus has been on smart home devices, however, there has been no focus on incorporating energy management devices into Matter yet. Therefore, the gap is being closed by taking the existing application layer developed for Zigbee (Smart Energy) into the CSA Data Model and to then develop a Matter-ready energy management application layer.

Once developed, the aim is also to incorporate the energy management application layer into the open GitHub repository.

Concerned ICT Standards and contribution to the related landscape

CSA Matter, CSA Data Model.

Impact (on European SMEs, related project or in the society)

Impact on SMEs

Given the increasing dangers of climate change due to excessive carbon emissions and the move towards net zero carbon emissions, along with the rapidly increasing energy prices, it has never been more important to take all steps possible to change energy consumption through smart applications, The inclusion of the energy management application layer in the Matter standard will enable European SMEs to develop Matter energy management products that will combine with other Matter products as part of the next generation of smart homes and buildings. Consumers can be informed of their energy consumption, appliances can be controlled intelligently to smooth demand on electricity grids and local generation and storage, including electric vehicles, can be integrated into a comprehensive home energy management system based on Matter.

Impact on Society

The main impact on society will be to benefit energy generators, distributors, and retailers by allowing intelligent control of appliances through smart tariffs to smooth delivery and reduce excess capacity. It will also benefit consumers by ultimately saving them money by using smart tariffs effectively. A more informed consumer will also be able to reduce their energy consumption and together consumers can help to move towards the net zero targets being set globally.

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

My involvement will lead to an enhancement of the Matter standard for energy management.

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

There have been no specific deliverables to date. The New Feature Requests being developed by the MPSG

What future efforts or activity are still necessary in your area of application?

I will need to participate in the development of the energy management application layer, which has only really just started given the development of the New Feature Requests. The project within the CSA is running late, which is why I anticipate my work to continue beyond the end of the Fellowship.

Online references related to the fellowship work

https://csa-iot.org/all-solutions/matter/

https://github.com/project-chip/connectedhomeip

https://csa-iot.org/developer-resource/specifications-download-request/

3GPP Rel-18 NR and IoT NTN

Mehmet Izzet Sağlam

Researcher and 3GPP RAN WG2 Delegate, Turkcell Teknoloji Araştırma ve Geliştirme A.Ş.

Turkey

Sector

5G

Engaged SDOs, WGs and TCs

3rd Generation Partnership Project (3GPP) Radio Access Network (RAN) Working Group (WG) 2

Role

Member

Addressed EU standardisation priorities and gaps

The expected impact of this fellowship will be related to mobility and service continuity algorithms between Terrestrial Networks (TN) and Non-Terrestrial Networks (NTNs). The current 3GPP release needs to enhance how user equipment (UE) moves from NTN to TN (Hand-In) of Rel-17 NTN. The funded project is related to 8.7.4 NTN-TN and NTN-NTN mobility and service continuity enhancements and 8.6.3 Mobility Enhancements agenda items.

Concerned ICT Standards and contribution to the related landscape

My fellowship is set to increase European competitiveness in the 3rd Generation Partnership Project (3GPP) Technical Specification Group Radio Access Network Working Group 2 (RAN WG2) for the 5G Advanced Non-Terrestrial Network domain. The 3GPP RAN WG2 oversees the radio interface protocols, the radio resource control specification, and the radio resource management procedures. 3GPP Rel-18 standard is also called 5G Advanced.

The normative NTN studies in 3GPP RAN WG2 started with Rel-17 introducing new network topologies with non-geosynchronous satellites like low earth orbit one. 3GPP NTN work item complements terrestrial networks with network coverage in unserved or underserved regions. A work item for NTN IoT is also studied during Rel-17. The first normative phase in 3GPP RAN2 WG aims for transparent payload architecture with FDD systems where all UEs are assumed to have GNSS capabilities. It was completed in Q2 2022.

This fellowship is related to 3GPP Rel-18 standards, it addresses the set of necessary mobility features and adaptations enabling the operation of the New Radio (NR) and IoT (Internet of Things) protocols in 5G Non-Terrestrial Networks for the 3GPP Rel-18.

Impact (on European SMEs, related project or in the society)

Impact on Society

The algorithm developed under my fellowship can decrease the power consumption of user equipment and 5G base stations. The energy price and its operational expenditures are now the most critical hot items for mobile network operators.

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

Yes, this fellowship has contributed directly to 3GPP RAN2 WG Agenda Item 8.6.3 Mobility Enhancements for NTN IoT and 3GPP RAN2 WG Agenda Item 8.7.4 NTN-TN and NTN-NTN mobility and service continuity enhancements for NTN NR.

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

Yes, I have drafted technical specifications.

What future efforts or activity are still necessary in your area of application?

The engaged works is to be continued as 3GPP Rel-18 will be completed in December 2023.

Online references related to the fellowship work

www.3gpp.org/

ECSO Working Group 1 Chairman SMEs (cybersecurity standardisation, certification and supply chain)

Mark Miller
Standardisation Expert, CONCEPTIVITY s.à.r.l.
Switzerland

Sector

Cybersecurity

Engaged SDOs, WGs and TCs

ECSO (the European Cyber Security Organisation) **WG1**
Standardisation, certification, labelling & supply chain management

Role

Chairman of the ECSO WG1

Addressed EU standardisation priorities and gaps

The gap is the issue of the standards and the resulting testing protocols not being "SME friendly". There is a very significant challenge as the standards, certification requirements and testing protocols are driving by the large players in industry, research, and the public sector. SMEs don't normally have the resources to participate in this discussion and in developing the necessary elements for cybersecurity standards and certification.

Concerned ICT Standards and contribution to the related landscape

In cooperation with CEN/CENELEC, ETSI and ENISA the European Cyber Security Organisation working group 1 is looking at addressing issues related to cybersecurity standards and a framework of standards - the focus of the fellowship is to ensure that the SME community is capable of being part of this discussion.

Impact (on European SMEs, related project or in the society)

Impact on SMEs

My contribution is specifically to ensure that SMEs are considered especially with respect to the cooperation, recommendations and interaction with the SDOs (ECSO WG1 having operational MoUs with ETSI and CEN/CENELEC). SMEs do not have the resources nor the possibility to engage in the discussions and elements related to cybersecurity standards and certification and as such, this fellowship was extremely valuable to ensure SME participation in the discussion.

Impact on Society

SMEs are a very important engine for technology growth and innovation and cybersecurity is a key issue, with no real SME friendly cybersecurity standards, the impact on society is related to economic growth and job creation. SMEs are disadvantage in cybersecurity standards, especially with respect to the related and required certification aspects - as such, the fellowship allowed me to be part of the discussion and to ensure that there were also more SME friendly approaches in each of the recommendations and thought processes.

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

Yes, I have drafted recommendations for the framework of standards are still in the process of being completed and will have to be vetted and approved by the European Cyber Security Organisation (ECSO) Board of Directors

What future efforts or activity are still necessary in your area of application?

SME are disadvantaged in standards and certification as their representation is not proportional to their innovation and commitment to addressing cybersecurity issues. Due to many difficulties and complexities involved in this specific Working Group, especially in achieving any kind of consensus, it is very challenging to move forward with SME specific and SME friendly approaches when most of the Working Group members come from large companies and significant research firms who are not necessarily supporting this approach, and thus much more investment is required to get as much SME participation as possible. Again, this fellowship has enabled SME participation in the "big boys" (large players in control) discussions, such that the fellowship has been extremely valuable.

Online references related to the fellowship work

www.ecs-org.eu

IEC 62351-9, Cyber security key management for power system equipment, second edition

Erik Andersen
Contributor and editor, Andersen's L-Service
Denmark

Sector

Cybersecurity

Engaged SDOs, WGs and TCs

IEC TC 57 "Power systems management and associated information exchange" WG 15 "Data and communication security"

Role

Member

Addressed EU standardisation priorities and gaps

The area of cryptographic algorithms is a somewhat complicated area. A detailed, but still easily understanding is needed to fill the gap for those seeking a better grasp of this material. The standard under development provides much needed guidance in how to apply a public-key infrastructure (PKI). This part of the document has been greatly extended also as a part of the fellowship. Attribute certificates are important additions to public-key certificates being added to the standard.

Concerned ICT Standards and contribution to the related landscape

This fellowship is dedicated for the second edition of IEC 52351-9, Cybersecurity key management for power system equipment. This specification has past the committee draft for vote (CDV) ballot and the comment resolution almost finished.

As part of the fellowship many comments on the text were developed and submitted through the Danish member body. Subsequently, also as part of the fellowship, a large annex on cryptographic algorithms have been extended and improved.

As an important part of key management, the ability to establish symmetric keys in a secure way is necessary for the protection of the information. The section describing that has had special focus.

The possibility to migrate to algorithms that a resistant to attack by future quantum computers, is a major concern, which has been addressed.

The continuation of the work will proceed with completion of the ballot resolution resulting in generation of revised and additional text. As the current process is at the very last stage of technical work, a very careful development of text and review the total document has been part of the activities for the fellowship.

Impact (on European SMEs, related project or in the society)

Impact on Society

The IEC 62351 is a series of important cybersecurity standards for power systems. IEC 62351-9 is a central part that this series. It provides general specification relevant for and supplementing other part of the series. As the updated and expanded second edition of IEC 62351-9 also will issued as a European Norm, it will have impact on the European cyber security protection of the electric grid.

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

Yes, the result is a second edition of IEC 62351-9 Cybersecurity key management for power system equipment.

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

Yes, I created Technical Specifications.

What future efforts or activity are still necessary in your area of application?

By the end of the fellowship, the technical work on the revised document is complete.

Online references related to the fellowship work

www.iec.ch/dyn/www/f?p=103:14:0::::FSP_ORG_ID%2CFSP_LANG_ID:2389%2C25

Towards Security as a Service and Cognitive Security Standardization

Muslim Elkotob

Principal Solutions Architect and Standardization Expert and Delegate to SDOs, Vodafone

Germany

Sector

Cybersecurity

Engaged SDOs, WGs and TCs

ETSI World Class Standards

ITU

IEEE

ETSI TC INT Core Network and Interoperability Testing
ETSI TC INT WG AFI Autonomic Management and Control Intelligence for Self-Managed Fixed & Mobile Integrated Networks
ITU-T FG-TBFxG Focus Group on Testbeds Federations for IMT-2020 and beyond
IEEE INGR Security
IEEE INGR SBB Standardization Building Blocks
IEEE INGR SysOpt System Optimization
IEEE INGR Testbeds

Role

Chairman of ETSI AFI, VC of ETSI TC INT, and VC of ITU-T FG TBFxG

Addressed EU standardisation priorities and gaps

This project addresses the following gaps:

- Lack of alignment and too many siloes in modelling security behaviour, consolidating workflow dynamics in multi-operator scenarios. The development of standards for Cognitive Security and Security as a Service is very sluggish and inefficient due to the lack of streamlining and a systematic approach with synergies.
- Absence of a blueprint/reference model for structuring and grouping security features in a reusable service architecture that is modular in nature. It is essential to proactively take the first step, as out of ETSI TR 103 857 to lay the foundation for enabling the building of such a reference model.

The main priorities of this project work are:

- Fostering the development of standards for cognitive, behaviour-modelled security to have native security services and Security-as-a-Service available in developed solutions. This is primarily achieved via using the ETSI GANA Multilayer Autonomics Framework as an enabler and mapping counterpart to the Service Architecture of Security.
- Enabling stakeholders such as CSPs, Vendors, Independent Software Vendors (ISVs) to collaborate and use reference components and modules as required by the respective use-case.

The addressed key challenges include:

- Modelling and standardising security functionality that interacts with or involves multiple stakeholders in a digital ecosystem.

- Keeping a balance between the commonalities in a reference model for security (and Security as a Service) and the specifics of stakeholders and their details.

Concerned ICT Standards and contribution to the related landscape

My fellowship is contributing to the ICT Standards landscape in several ways, including IEEE INGR Security and ETSI:

Within IEEE INGR Security, I am WP Leader on Security Standardisation, and an active member in IEEE INGR SBB (Standardisation Building Blocks). Putting the IEEE INGR Security work into a framework collectively formed by the work of SDOs such as ETSI and ITU paves the way for standardised results with a high reuse factor for Security as a Service (SaaS), Cognitive Security, and Behavioural Shaping and Orchestration of Security operations. The work I am doing within IEEE INGR Security is backed by bi-weekly meetings to track the progress and align on the Standardisation work.

Within ETSI, where the bulk of the results of this project have been put into the Deliverable TR 103 857 with the key content conveyed 2 chapters covering the following aspects.

- The aspect of Multi-layer Autonomics forms the foundation and plays a key role in enabling Behavioural Shaping, Orchestration, and Cognitive Security as well as the Standardization of those aspects. Security as a Service including drivers for using this model, horizontal and vertical segmentation of the service spectrum, and Service Assurance across the span of security services.
- GANA Knowledge Plane (KP) based behavioural steering including collaboration among KPs within one or across multiple stakeholders, as well as Security Behavioural Shaping.
- Security Functional Orchestration and Security Programmability respectively.

Impact (on European SMEs, related project or in the society)

Impact on SMEs

The modularisation of Security, and the Service Architecture enabling Security as a Service (SaaS), and standardising this feature in its lifecycle and mail elements such as APIs, reference points, accessibility, and interfaces enables disruptive and smaller players (especially SMEs and ISVs (Independent Software Vendors) to take part in this ecosystem and contribute with their algorithms and software and services to the SaaS spectrum.

Impact on Society

The work in this fellowship project on Cognitive Security and Security as a Service with focus on Standardisation impacts society in two main ways:

- Firstly, increasing inclusion and collaboration among stakeholders of all types, especially SMEs and ISVs (Independent Service Vendors) by allowing them to take part in the standardised service-architecture backed Security as a Service spectrum with specific targeted pieces of software covering specific feature sets, to be part of the overall SaaS. Previously, a Security Provider had to cover the whole spectrum of features, putting the bar very high for SMEs and ISVs, making it very hard for them to take part in the ecosystem.
- Secondly, the work done bridges the gap and shortens the distance between service providers (mainly Software Service Providers, especially in the area of Security) to the receivers of those services via the modularisation and more inclusive open ecosystems that result from this work. Thus, in line with Digital Transformation that enables flexible mode of operation and agile service bootstrapping, composition and onboarding, those goals are better achieved, at least to some extent.

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

Yes, to the ETSI Technical Report DTR/INT-00900 (TR 103 857).

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

I have contributed to several technical reports on new operating procedures, on common terminology, on reference data and on reference material.

What future efforts or activity are still necessary in your area of application?

I recommend continuing the engaged efforts; Security as a Service, Cognitive Security, and Security Behavioural Modelling as well its Automation and Orchestration are all not yet fully matured aspects, and they are best streamlined and brought to a common line via standardisation; this project has achieved a significant step in the right direction, and there is more to do regarding more detailed architectural models (with APIs, reference points, etc.) to be standardised.

Online references related to the fellowship work

- https://futurenetworks.ieee.org/roadmap/ingr-2022-edition
- https://futurenetworks.ieee.org/images/files/pdf/INGR-2022-Edition/IEEE_INGR_Security_Chapter_2022-Edition-Preview.pdf
- www.etsi.org/committee/int
- https://portal.etsi.org/TB-SiteMap/INT/INT-WG-AFI-ToR
- www.itu.int/en/ITU-T/focusgroups/tbfxg/Pages/default.aspx

Participation, contribution to ISO/IEC SC37 WG3/WG4, development of ISO/IEC 39794-2 fnger format

Pavel Cuchriajev
Delegate, Standard Norge
Lithuania

Sector

Cybersecurity

Engaged SDOs, WGs and TCs

ISO/IEC SC37 Biometrics WG3 Biometric data interchange formats
ISO/IEC SC37 Biometrics WG 4 Technical Implementation of Biometric Systems

Role

Member

Addressed EU standardisation priorities and gaps

The new extensible minutiae format, that is being developed will fix the issues and flaws of its predecessor as well as simplify the adoption of biometric user authentication (by using the latest data exchange formats that are easier to integrate into the latest development environment) and data exchange between different government organisations in Europe and worldwide. Existing flaws with forward and backward compatibility as well as XML and ASN.1 compliance will be fixed making the new extensible formats future proof.

Concerned ICT Standards and contribution to the related landscape

The key objective of my fellowship is to set and enhance industry standards for enabling the protection of citizens' privacy, digital identities, and interoperability of different systems that operate with mentioned identities. Biometrics has become very important over the last decades, unfortunately, most of the implementations of system-level and actual biometric systems still rely on proprietary solutions and store data in potentially insecure environments and not in the transferable or interoperable states. The Extensible Biometric Information Interchange Format ISO/IEC 39794 defines a system that can help to improve on previously defined standards considering the latest technology improvements that were or are currently being developed. ISO/IEC 39794-2 covers fingerprint minutiae and is designed for various applications including government ID.

Impact (on European SMEs, related project or in the society)

Impact on SMEs

Standardised data formats for biometric data like ISO/IEC 39794-2 are essential for the interoperability of biometric data and the adoption of biometrics worldwide. They allow the creation of common interfaces for biometric data interchange and usage. This is important, because SMEs can this way compete with big corporations to provided biometric services to governments and business.

Impact on Society

Once the standard is released and adopted, it should ease the use of the biometrics in everyday life by introducing interoperability between different governments, government systems and consumer applications.

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

Yes, the standard ISO/IEC 39794-2 is currently in DIS stage and are waiting for national governing bodies voting results.

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

Yes, I have contributed to technical reports on the development of a new standard and on recommendations on a new / revised standard.

What future efforts or activity are still necessary in your area of application?

Standard is currently in DIS stage (national governing bodies are voting for approving the standard). Based on voting results, modifications to the standard could be required.

Online references related to the fellowship work

www.iso.org/committee/313770.html

Report on evaluation of ETSI TC CYBER standardisation deliverables based on Common Criteria

Octavian Popescu
Consultant, EUCOMREG
Belgium

Sector

Cybersecurity

Engaged SDOs, WGs and TCs

ETSI TC CYBER

Role

Member

Addressed EU standardisation priorities and gaps

Currently, ENISA is in the process of finalising the EUCC scheme which is applicable to IoT. For the EUCC scheme to be effective in the Europe Union and associated countries, it should be supported by standards recognised at the European level and produced in Europe. EUCC related evaluation should be performed using European standards which might be lacking or do not have aligned terms.

Now, ETSI TC CYBER, to which I contribute, has in process several standards and standardisation deliverables. It is important to have those aligned, especially in terminology for the regular standards user to be able to use the standards confidently. ETSI standards like EN 303 645 and the TS 103 732 are not yet fully used as instruments for providing a basis for the certification process. Once these standards are evaluated and aligned for such a use this situation will improve European Common Criteria process from a European perspective.

Concerned ICT Standards and contribution to the related landscape

My fellowship project contributes to activities that might pave the ground for ETSI TC CYBER standardisation products to be used for EUCC and CC evaluation, leading also to the uptake of European Harmonised standards like EN 303 645. Part of my project was my support to the New Work Item, created under TC CYBER, for the purpose of developing and certifying a version of the recently published TS 103 732 - "CYBER Consumer Mobile Device Protection Profile".

Impact (on European SMEs, related project or in the society)

Impact on SMEs

After discussing the topic of cybersecurity evaluation with several SME representatives, and being a consultant, I believe there is a need for finding the clear terms for communication of the goals and processes for the cybersecurity evaluation process under EUCC. Bringing forward and trying to clarify with my interventions and possible contributions in the work of aligning the terminology used is establishing the base for a better understanding and efficient communication on this topic, by the SME community and especially in Europe.

Evaluating the ETSI CYBER standards and deliverables for their use in the Common Criteria scheme, and in the EUCC scheme as it becomes available represent an advantage for SMEs

in general and European SMEs. This is since such standards are easily accessible: the price for accessing them is low, or they are free once published by ETSI.

Impact on Society

Globally, IoT (including mobile consumer devices) pervades all aspects of the society and creates opportunities for cybersecurity attacks, and increased mistrust in the society. In my work, I support the improvement of the protection against cyber security threats.

With my work I reached out to ETSI members, most of whom can be identified also as stakeholders / actors in the IoT market, and supported starting the Common Criteria work, with a standardisation deliverable - TS 103 732. Proposing the Common Criteria as a framework / model for analysing the standardisation deliverables offers a path to a unifying perspective for IoT cybersecurity evaluation and use of standards.

If eventually EN 303 645 and other similar TC CYBER standardisation deliverables are aligned and integrated in the Common Criteria evaluation process this may create the basis for certification that is recognised globally.

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

Yes, I contributed to the development of TS 103 732 will represent the result of the evaluation process.

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

Yes, technical specifications.

What future efforts or activity are still necessary in your area of application?

The engaged work should be continued. Through this fellowship, I supported the New Work Item for the certification of TS 103 732 Consumer Mobile Device Protection Profile, which is in its initial stages. This NWI is backed by a Specialist Task Force (STF), where a laboratory will formally evaluate this Protection Profile. The TS 103 732 is defined as a Protection Profile following the structure from the Common Criteria standards but has not been evaluated as formal Protection Profile. It is important to obtain certification from a nationally recognised Certification Body.

Online references related to the fellowship work

www.etsi.org/committee/cyber

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

Christophe Stenuit
Standards Expert, Viewconcept.be
Belgium

Sector

Cybersecurity

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

Member

Addressed EU standardisation priorities and gaps

This fellowship has an objective 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. The proposed 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

This fellowship contributes to a better harmonization of e-identity architecture and practice for standardization support in Europe. It also contributed to ease the implementation of other e-identity and e-privacy developments. Moreover, I contribute to proposing/revising/amending/reviewing standards. Progress was made on the following ICT standards:

- ISO/IEC 24760-1 about identity management terminology and concepts, adopted as prEN ISO/IEC 24760-1, being amended
- ISO/IEC 24760-2 about identity management architecture, being revised
- ISO/IEC 24760-3 about identity management practices, being amended
- ISO/IEC 29146 about access management, amended and progressed toward being adopted as prEN
- ISO/IEC 29184 about online privacy notices and consent progressed toward being adopted as prEN

In addition to these standards, I have also supported several standardisation activities in relation to:

- Data Protection guidance for a single person acting as controller, as part of the CEN-CLC-JTC13-WG5 (CEN/CLC/JTC 13/WG 5 N 278)
- Cooperation Agreement between CEN-CENELEC and EDPB, , as part of the CEN-CLC-JTC13-WG5

- Developing threats and possible mitigations to risks associated with identity management, as part of the ISO JTC1 SC27 WG5
- Data Privacy threats and Controls, as part of the ISO JTC1 SC27 WG5
- Analysis of identification and authentication, as part of the ISO JTC1 SC27 WG5.

Impact (on European SMEs, related project or in the society)

Impact on SMEs

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

Impact on Society

These standards will foster the secure European societies by protecting freedom and security of Europe and its citizens.

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

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

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

Yes, several technical reports on recommendations for new/ revised standards, on common terminology, on reference material and on the development of new standards.

What future efforts or activity are still necessary in your area of application?

Most developed texts are achieving maturity. The referred work items are being more and more used or referred in the industry. Some efforts are still required to achieve publications. This could take up to 18 or 24 months. This activity will continue over 2023, and achieve a publication during 2023 and 2024.

Online references related to the fellowship work

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

www.iso.org/committee/45306.html

Supporting ISO/IEC 27031 revision, European experts and liaisons inputs within the project

Thierry Maxime

Project manager In Quality Management Systems, TRAX Solutions

France

Sector

Cybersecurity

Engaged SDOs, WGs and TCs

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

Role

Member

Addressed EU standardisation priorities and gaps

The difficult points of this mission to support the revision of ISO 27031 concern several aspects, and in particular the major gap concerns the consensus. This type of gap is relatively common in this type of work, and the solutions is to find an agreement between the different experts forming the round table to define together the critical path based on the proposals that were formulated beforehand. The formulation of the comments precedes the international consensus, and this work Is conducted at the national, in my case at French, level which Is then reflected, allowing the positioning of the support to SMEs. Therefore, managing the consensus is a challenge one needs to understand the distinct positions and the usefulness of the evolution in the proposed text.

During my fellowship, the key issues that were debated concern the structure of the evolving standard and the clear articulation with the topics related to the business continuity of organisations.

The priority of this fellowship is to produce a document and content that is useful for the organisations and beneficial for the stakeholders (the end users of the services provided by the companies or organisations implementing business continuity preparedness principles).

My priority is to ensure the continuity of my work with a new editorial team. The main challenge concerns the development of recommendations or support for the development of recommendations inherent in the structure of this standard that remain valid over time, or at least for a certain period, to make this standard useful and generic enough to be adopted.

Concerned ICT Standards and contribution to the related landscape

My fellowship contributes to the revision of the ISO 27031 Information technology — Security techniques — Guidelines for information and communication technology readiness for business continuity.

This standard develops ICT readiness, which is of main importance in business continuity management implementation in accordance with information security within organisations.

Indeed, this work is essential for organisations facing increasing risks and threats in an unstable environment when they rely more and more on ICT, supplying them guidance to gain more resilience to infrastructures and organisations.

This fellowship allowed me to dedicate enough time working with my co-editors and to consider international experts contributions and inputs in the revision process.

I did prepare and facilitate sessions related to ISO 27031's revision project and participate in all the dedicated meetings linked to ISO 27031 matter. Also, I have provided standards-based advice, especially to SMEs that must comply with ISO 27001 certifications and that for the most part have many questions around the topic of ICT infrastructure resilience in their security and continuity strategy.

Impact (on European SMEs, related project or in the society)

Impact on SMEs

My work has a direct impact on ICT business continuity readiness concerns of all kinds of companies, and especially SME's that are considered more vulnerable. In addition, the participation of Small Business Standard (SBS) liaison in my revision work on ISO/IEC 27031 demonstrates this importance for SME's. Indeed, SBS is a highly active liaison with whom we have regular exchanges, to ensure suitability of the text to SME's context, and make sure they can leverage on this standard to better prepare and adapt in terms of information and communication readiness plans for business continuity.

Impact on Society

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

- SDG 3 Good health and well-being.
- SDG 8 Decent work and economic growth.
- SDG 9 Industry, innovation and infrastructure.
- SDG 10 Reduced inequalities.
- SDG 11 Sustainable cities and communities.
- SDG 12 Responsible consumption and production.
- SDG 16 Peace, justice and strong institutions.

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

Yes, I am the editor of ISO 27031 revision.

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

Yes, I have drafted technical report on recommendations for revised standards.

What future efforts or activity are still necessary in your area of application?

Currently the revision project is running its course and the step to the CD level is initiated. The maturity of the revision project is achieved by preparing the next WG meetings to ensure consensus around the future evolutions and the solutions proposed by the standard.

Online references related to the fellowship work

www.iso.org/committee/45306.html

Strenghtening Security & Privacy standards consistency in coherence with SC27&SC42/ CEN JTC13&JTC21)

François Lorek
Expert In Cybersecurity, TRAX Solutions
France

Sector

Cybersecurity

Engaged SDOs, WGs and TCs

CEN/CENELEC JTC13 'Cybersecurity and data protection / WG2 / WG4 / WG5
CEN/CENELEC JTC21 Artificial Intelligence / WG2 /AG3 /AG5
ISO/IEC JTC1 SC27"Information security, cybersecurity, and privacy protection" / WG1 Information security management systems
ISO/IEC JTC1 SC27 / WG4 Security controls and services
ISO/IEC JTC1 SC42 Artificial intelligence / WG1 Foundational standards

Role

CEN/CENELEC JTC021 - Head of French Delegation
ISO/IEC JTC1 SC27 WG4 - Vice convenor

Addressed EU standardisation priorities and gaps

With this fellowship, the coordination and synchronisation between technical committees and working groups in one of the biggest challenges to face with lots of meetings on various inter-dependant topics (cybersecurity and privacy, artificial intelligence etc..) with several initiatives with different schedules at different international, European and national scales. The addressed priorities are given mostly by European Commission, the SDO's directives, the market's expectations, and the maturity of consensus between experts. I truly hope that lots of experts (especially European) are taking part to several cross work across TC's, SC's and WG's

Concerned ICT Standards and contribution to the related landscape

This fellowship enabled me to take part into all meetings concerning Cybersecurity & Privacy as well as Artificial Intelligence (even most are very early or very late in the day, as per rules for scheduling in SDO's), whilst being able to keep delivering standard based consulting especially for SME's that need to comply for ISO 27001 certifications.

Impact (on European SMEs, related project or in the society)

Impact on SMEs

SMEs are impacted by Cybersecurity & Privacy or Artificial Intelligence standards as there is growing need to make the customers and the markets confident about the proposed technology solutions.

Impact on Society

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

- SDG 3 Good health and well-being
- SDG 8 Decent work and economic growth
- SDG 9 Industry, innovation and infrastructure
- SDG 10 Reduced inequalities
- SDG 11 Sustainable cities and communities
- SDG 12 Responsible consumption and production
- SDG 16 Peace, justice and strong institutions

For SC 27, gender and geographical balance is an important goal. As of December 2021, ISO Global Directory lists 1905 experts as committee members, officers or liaison representatives for SC 27 including working groups (duplicates removed). 23% of these experts are female, 77% male. 3% of the SC 27 experts come from Africa, 21% from America, 36% from Asia Pacific and 40% from Europe.

One expert from Africa, four experts from America, seven from Asia Pacific, and eleven from Europe work in SC 27 officer positions. Four out of the 23 SC 27 officers are female. Five experts from Africa, 40 from America, 92 from Asia Pacific, and 84 from Europe currently work in SC 27 editor positions. 52 out of the 221 SC 27 editors and co-editors are female.

WG4 is the SC27 working group with the best balance with 46% in the latest WG4 Gender study presentation (WG4 N5657) given during recent SC 27 Plenary Meeting in April 2022.

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

Yes, within SC27 WG4 where I am vice-convenor, there are currently 68 projects listed including 41 published standards 9 PWI on going, 2 projects in Proposal phase and 1 project in Preparatory phase. Also, CEN/CLC JTC21, where I am a contributing member, is currently working on several NWIPs.

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

Yes, I have contributed to technical reports on the development of new and revised standards.

What future efforts or activity are still necessary in your area of application?

With all ongoing projects in the different engaged work groups, my contribution will continue beyond this fellowship.

Online references related to the fellowship work

www.iso.org/committee/45306.html

www.iso.org/committee/6794475.html

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

Consent records and privacy risk mitigation in Distributed Ledger Technology

Jan Lindquist
Privacy Manager (CIPM), SSI and DLT Specialist, Linaltec AB
Sweden

Sector

Privacy Protection

Engaged SDOs, WGs and TCs

ISO SC27 Cybersecurity /WG5 Identity management and privacy technologies
ISO TC 307 Blockchain and distributed ledger technologies /JWG4
Joint ISO/TC 307 - ISO/IEC JTC 1/SC 27 WG: Security, privacy and identity for Blockchain and DLT

Role

Chair of AG5 WG - Swedish institute of Standards (SiS)

Addressed EU standardisation priorities and gaps

This fellowship tackles several works in the field of privacy protection. A lot of effort was given to have the 27560 ready for DTS which is in last phase of national body review before publication. An article was submitted to River Publishers describing the impacts of the privacy rights through the usage of privacy receipts (aka 27560) DLT/blockchain solutions and eIDAS/wallet.

To influence how privacy rights and how privacy receipts in identity management (i.e., eIDAS) joined a recently created group, CEN/TC 224/WG20, "Ad hoc group on European digital identity wallet". The goal is to address a gap identified during writing of the article. Namely, there is hardly mentioning of the privacy rights of citizen when communicating how their personal data in the form of attested attributes are used.

Moreover, the new PWI in JWG4 has not received as strong of a support as originally expected and the new digital identity has a more central role in addressing privacy rights. The work has shifted to identity management. One outcome from the PWI discussions was to move some of the work around anonymization level or score to standards in SC27 WG5 and ISO standard 27559. This was well received by editors of 27559 but it was close to publication and could not be update with major comments.

DLT as promoted by ISO may also come across another challenge and it is industry adoption. EU is strongly promoting Data Blocks (data.europa.eu) using work from IDS and Gaia-x. Unfortunately, these industry forums do not cover individual privacy rights. How an individual controls potential identifiable information is not explained. To address this gap, I have initiated informal IDS discussions over how to be able to add the data governance.

Concerned ICT Standards and contribution to the related landscape

Currently the funding is contributing in 2 ICT standard areas:

- Area 1: Immutable consent record with purposes for processing personal data. With this fellowship, I continue editing work of ISO/IEC 27560, consent record structure, in ISO SC27 TC 318 WG 5 and I coordinate with relevant standard groups interested in the work, CEN JTC13 WG5 (privacy). The work is key to establish the correct practices when deploying DLT

from the start. This also includes establishing a dialog with EBSI and eIDAS2 to cover the roadmap to introduce reference implementation. Note reference implementation will be demonstrated based on NGI eSSIF-lab work activity, as well as Kantara who originally developed the first consent record.

- Area 2: Privacy risks in DLT solution. I am directly involved with the new project "Re-identification and privacy vulnerabilities and mitigation methods in blockchain and DLT" in ISO TC 307 JWG4. The work is key to identify controls required to add to Privacy Information Management Systems (ISO/IEC 27701 PIMS) in DLT solutions that may require privacy certification to support Data Governance Act where data exchange is decentralised.

Impact (on European SMEs, related project or in the society)

Impact on SMEs

The work carried out in this fellowship will help SMEs by making it easier to describe processing of personal data that is machine readable (ISO 27560) and allowing individuals using the services from the SME to objectively reject or accept sharing of personal data with an SME. The work will also support the EU's data sharing strategy by limiting how personal data is shared to only what is needed to provide a service by SME. Additionally, data brokers or intermediaries as promoted by Data Governance Act will have a clear traceability of how data is shared with 3rd parties (SME's).

Impact on Society

The publication off ISO 27560 will have a big impact to promote creating a digital receipt with details of use of personal data like going to the grocery store and getting a receipt with purchases items. It is not only the receipt that makes it revolutionary, but you also get a notice prior to "accepting" to share your data. After the consent a digital privacy "consent" receipt is issued sent to digital mailbox or digital wallet. The information contained in the notice uses a privacy ontology (W3C Data Privacy Vocabulary) making it machine readable and interoperable. Instead of having a lengthy privacy policy and "death by cookies" when browsing it is possible to automate the consent, rejection or customise consent to only mandatory privacy attributes. This can take place in the background using privacy preferences rather than require reviewing every single consent.

If the EU will eventually adopt a digital wallet that contains identity information you can also be able to collect the consents. The consent details make it possible to easily exercise privacy rights or contact data privacy authority. Eventually, privacy preferences can automate the rejection or give warnings of details that are sensitive.

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

Yes, there have been discussions in last WG5 meeting potential new standardisation projects. And, next meeting in April 2023, should expect proposals for new projects in consent and digital receipts and what could be next after 27560.

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

Yes, I drafted technical specifications.

What future efforts or activity are still necessary in your area of application?

The initiated projects in consent and digital receipts will be pursued after ISO 27560.

Online references related to the fellowship work

www.iso.org/committee/45306.html

www.iso.org/committee/6266604.html

Standards for Quantum Photonic Integrated Circuits – Part 2

Richard Pitwon
Consultant Resolute Photonics UK Ltd
United Kingdom

Sector

Quantum Technology

Engaged SDOs, WGs and TCs

IEC TC86 SC86C WG4 – Fibre optic active components and devices

Role

Chair in IEC TC86 SC86B

Addressed EU standardisation priorities and gaps

The UK and EU are currently leading the world in quantum science, however commercial realisation of that knowledge is hindered by the fact that many companies that have the capabilities required for elements of a QPIC supply chain do not frequently collaborate. Consequently, EU QPIC developers must seek out bespoke solutions from a fragmented ecosystem or take advantage of more responsive/coherent offerings available outside of the EU.

It is exactly for this reason that the Photonics 21 Private Public Partnership have defined Quantum PICs as a priority call topic for Horizon Europe 2023.

Having successfully launched the IEEE UK and Ireland Quantum group in the preceding OC#3 fellowship project, I have been active in promoting quantum engineering as a key engineering discipline in the UK and Ireland through the IEEE's extensive links to educational institutes. On this project, I leveraged these links to encourage undergraduate and postgraduate students across European educational institutes to fully participate in these activities, to instil an early and strong appreciation of the importance of standardisation. To this end the two-day quantum symposium was subsidised with very low registration costs compared to similar conferences to ensure accessible and affordable to young researchers.

Using the feedback from across the quantum industry I worked with NPL in the UK and an industrial optical connector company to experimentally identify viable benchmarks for QPIC technologies, fibre-to-QPIC coupling loss <0.5 dB.

During this fellowship I authored and co-authored three papers, which have been accepted for publication and I delivered two invited talks including my talk "Standardisation for chip, board and system-level quantum interconnect" for the 9th Stand ICT Walk and Talk on EU Standardisation Priorities - Quantum Technologies on 13th October 2022.

Concerned ICT Standards and contribution to the related landscape

This final fellowship project has allowed me to both create recognition for quantum grade interconnect across mainstream standards organisations and recognition of the importance of standardisation to the quantum industry. In his final part of my fellowships, I authored three papers, which have been accepted for publication and I delivered two invited talks. I am currently co-authoring a joint paper with NPL and Senko on the QPIC-to-fibre coupling element and quantum grade connectors for the Applied Sciences Special Issue: "Quantum Interconnect: Moving Qubits to the Network, System, Board and Chip, for which I am also the Guest Editor.

I have continued to prepare the draft for the IEC Technical Report "Introduction to Quantum Technologies", which will continue to progress through the IEC review process and will lay the foundation for introduction of quantum interconnect and QPIC standards in IEC TC86.

Impact (on European SMEs, related project or in the society)

Impact on SMEs

On this fellowship project, I organised events to bring stakeholders from the quantum industry together including the two-day in-person Joint Symposium on Quantum Technologies on 13th and 14th September at NPL, London and the one-day 8th Symposium on Optical Interconnect in Data Centres on 21st September 2022, which was part of ECOC 2023 in Basel. This provided exposure and promotion for many European and UK quantum SMEs including QUIX, ID Quantique, Aegiq, Quantum Dice, ColdQuanta, Ligentec, SEEQC, KETS Security, Lumiphase.

I have continued my collaboration with the UK National Physical Laboratory (NPL) and industrial optical connector company Senko to lay the foundation for new standards on Quantum Photonic Integrated Circuits. I supported Senko's introduction of a new coupling element, which will further reduce fibre-to-QPIC coupling losses. Full details are provided in detailed report, to be emailed with this submission.

Impact on Society

The work carried out in this fellowship has further promoted the commercial need for quantum grade interconnect for QPICs through the development by a mainstream global optical connector company (Senko) of new QPIC couplers and the work by the UK national metrology institute (National Physical Laboratory) on benchmarks for quantum interconnect.

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

My fellowship has contributed to the imminent proposal for a new ISO/IEC/JTC on Quantum technologies.

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

Yes, I have drafted a technical report on reference data.

What future efforts or activity are still necessary in your area of application?

My work to drive the standardisation in quantum has been supported on several StandICT.eu2023 fellowships. However, laying the foundation for the first quantum standards takes a lot of efforts, requiring many people and organisations to go even further.

Online references related to the fellowship work

- www.npl.co.uk/events/npl-joint-symposium-on-quantum-technologies
- www.ecoc2022.org/programme/symposia/10-programme-description/77-symposium-optical-interconnect-in-dcs
- www.mdpi.com/journal/applsci/special_issues/Quantum_Interconnect

Danish participation in the ISO/IEC JTC 1/SC 32 WG 3 Database languages (SQL and new GQL), 5th term

Thomas Frisendal
Independent Expert
Denmark

Sector

Semantic Interoperability

Engaged SDOs, WGs and TCs

ISO IEC/JTC1/ SC32/WG3 Database languages

Role

Member

Addressed EU standardisation priorities and gaps

Graph database technology is a key enabler of meaningful and explainable machine learning and AI, which makes significant positive impact on their applications in our societies. The standards work takes place within the ISO/IEC JTC 1/SC 32 framework, and the committee WG 3, which does the work, is dominated by the US, and with strong presence from Asia etc. There are only 7 EU member countries actively participating in ISO/IEC JTC 1/SC 32: Denmark, Finland, Germany, Italy, Netherlands, Poland, and Sweden. I have been financing my participation (since 2019) myself.

Concerned ICT Standards and contribution to the related landscape

My fellowship focuses on two key standards:

- ISO/IEC/JTC 1/SC 32 Information technology — Database languages — SQL, Parts 1 through 16.
- ISO/IEC WD 39075 Information Technology — Database Language GQL.

Impact (on European SMEs, related project or in the society)

Impact on SMEs

Since graph database technology is a key for meaningful and explainable machine learning and AI, it is evident that these standards will have positive impact on applications also in the SME context. So, using graph technology and query language is very important since graph database concepts have a lower learning curve and thus more rapidly and intuitively can impact ICT solutions, also in the SME world. SME companies can engage in new technologies without prohibitively large investments in technical expertise.

Impact on Society

Graph database technology is key for meaningful and explainable machine learning and AI, and it already has positive impact on our societies. Also, the human aspect of using graph technology languages is very important. The SQL universe is somewhat technical, but graph database concepts have a lower learning curve and thus enables better effects, more rapidly. By contributions and influencing, the new Graph Query Language standard being developed by the ISO IEC/JTC1/ SC32/WG3 committee on database languages, I hope to add some European human aspects making the technologies easier to handle in SME sized organisations.

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

Yes, the new GQL standard is currently in committee draft ballot status.

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

Yes, several discussion papers, some draft document comments, and a few change proposals for GQL, but also a few on the SQL standard revisions.

What future efforts or activity are still necessary in your area of application?

My aim is to continue contributing to the successful publication of GQL as a new international standard, hopefully before the end of 2023.

Online references related to the fellowship work

www.iso.org/standard/76120.html

IoT Semantic Interoperability Specialization to Digital Twin for Agriculture and relationship to AI

Amelie Gyrard
Principal Research & Innovation Consultant, Trialog
France

Sector

Semantic Interoperability

Engaged SDOs, WGs and TCs

ISO/IEC SC 41 IoT and Digital Twin
ISO/IEC SC 42 AI WG 5
IEEE Std 1872.2-2021 Autonomous Robotics (AuR) Ontology

Role

Member

Addressed EU standardisation priorities and gaps

This fellowship contributes to two main priorities:

- The standardisation of IoT Interoperability by ensuring integration of SAREF and other European contributions into ISO/IEC 21823-3 IoT semantic interoperability (as co-editor).
- The standardisation of AI architecture by ensuring integration of European contributions on AI and interoperability (e.g. BDVA, IDSA, AIOTI, and H2020 projects such as IoT large-scale projects) into ISO/IEC JTC1/SC42 AI 5392 Knowledge Engineering Reference Architecture (as a contributor).

Concerned ICT Standards and contribution to the related landscape

My fellowship addresses several ICT standards related to IoT, AI and robotics, namely:

- ISO/IEC SC 41 IoT and Digital Twin
  - ISO/IEC 21823-3 IoT Semantic Interoperability
- ISO/IEC SC 42 AI
  - ISO/IEC 5392 Knowledge Engineering Reference Architecture (KERA)
  - Ontologies, Knowledge Engineering, and Representation (OKER) Report – Draft
- IEEE Std 1872.2-2021 Autonomous Robotics (AuR) Ontology

Impact (on European SMEs, related project or in the society)

Impact on SMEs

According to the ICT Standardisation priorities for Digital Single Market, expected impacts are:

- Foster an interoperable environment for the Internet of Things, working with ESOs and international SDOs. Develop consensus under the umbrella of the Alliance of IoT innovation (AIOTI), targeting reference architectures, protocols and interfaces, the promotion of open application programming interfaces (APIs), support of innovation activities related to reference implementations and experimentation and the development of missing

interoperability standards. As part of its progress review, the Commission will assess if further steps are needed to tackle identified interoperability failures, and if necessary, consider using legal measures to recommend appropriate standards. 1) Promote an interoperable IoT numbering space that transcends geographical limits, and an open system for object identification and authentication. 2) Explore options and guiding principles, including developing standards, for trust, privacy, and end-to-end security, e.g., through a 'trusted IoT label'. 3) Promote the uptake of IoT standards in public procurement to avoid lock-in, notably in smart city services, transport, and utilities, including water and energy.

- Solve fragmentation.
- Promote the uptake of IoT standards.

Impact on Society

The IoT addresses many societal challenges including climate change, resource and energy efficiency and ageing. In the emerging IoT economy, voluntary global standards can accelerate adoption, drive competition, and enable cost-effective introduction of new technologies. Moreover, 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. Therefore, Interoperability between IoT networks operated by different companies along the value chain opens 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 the development of new or revised standards?

- (Now published) Trialog co-editor of JTC1-SC41/167/CDV - ISO/IEC 21823-3:2021 Internet of things (IoT) — Interoperability for IoT systems — Part 3: Semantic interoperability.
- (Published) IEEE Std 1872.2-2021 Autonomous Robotics (AuR) Ontology.
- (Under development) Trialog contributed to ISO/IEC 5392 Knowledge Engineering Reference Architecture (KERA).

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

Yes, I have drafted technical report on the development of new standards.

What future efforts or activity are still necessary in your area of application?

My investment in the different Standardisation activities will continue beyond this fellowship, addressing the following ones:

- ISO/IEC CD 5392 Knowledge Engineering Reference Architecture (KERA) that is still under development
- OKER under development
- Follow up IEEE P1872.3 Standard for Ontology Reasoning for Multiple Autonomous Robots
- Follow up of CEN/TC 471 Unmanned aircraft systems
- Follow up ISO/IEC AG 19 Unmanned aircraft systems (UAS)

Online references related to the fellowship work

www.iso.org/standard/83752.html

https://standards.ieee.org/ieee/1872.2/7094/

www.iso.org/standard/81228.html

Generalized Quantum Random Numbers Generation Technical Standardisation

Jacak Witold
University Professor at WUST
Chair of the Board of Directors of EITCI Institute,
Coordinator of the EITCI Quantum Standards Group European Information Technologies Certification Institute
Belgium

Sector

Quantum Technology

Engaged SDOs, WGs and TCs

EITCI QRNG-QSG (Quantum Random Numbers Generation - Quantum Standards Group hosted under EITCI Institute)
CEN/CENELEC Focus Group on Quantum Technologies (FGQT)

Role

Chair of EITCI-QSG, member of FGQT

Addressed EU standardisation priorities and gaps

This fellowship advances my 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-ISG Industry Specification Group, in works of which the applicant participates 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 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

This fellowship supports standardisation efforts in quantum information processing and communication (QIPC) technologies for facilitating their uptake as roadmapped in the EU Quantum Flagship program (€1b funding in 10 years timescale). It aims to advance international work on standardization of random numbers generation (non-entanglement and 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-ISG (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, workings towards breakthrough in quantum repeater technology enabling inter-metropolitan 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 2017.

Impact (on European SMEs, related project or in the 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 euros and dollars in R&D. SMEs play a crucial role in development of innovation and with QT it is no exception. Standards for basic quantum infrastructures such as quantum information encryption in future quantum networks can support innovation in quantum technology and accelerate its uptake by European SMEs. This is already happening among multiple start-ups in Europe, with a lot of their founders and/or key engineers engaging in the standardization effort of the action (the cooperation is developing rapidly).

Impact on Society

True (quantum) randomness has significant applications not only in quantum domains. Classical cryptography, as well as in mathematical modelling and many other fields widely rely on random numbers with various levels of required entropy (random binary sequences usually need to be certified in statistical testing of randomness levels). Hence industry-specification consensus efforts towards a truly (quantum) random number generation standards are expected in various novel techniques to employ quantum mechanics phenomena to generate non-deterministic random binary strings. These efforts follow already mature standards in QKD as well as the currently under development standards in quantum computing.

The societal impact of the action is in supporting European's leading role in quantum technologies. Quantum engineering is expected to revolutionise industry on an unprecedented scale, surpassing technological revolutions witnessed so far. It is important for Europe and its citizens to be at the forefront of these developments as they will define economic and hence societal position of the EU in the future.

European leaders understand potential of quantum technologies and allocate adequate means to support developments in this domain with programs such as Quantum Flagship or European Quantum Communication Infrastructure. Important enabler for these efforts is standardisation of emerging quantum technologies, with quantum cryptography as an early application, enabled and conditioned by the quantum random numbers generators (QRNG) to provide information-theoretic security level of communication.

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

The project directly contributed to development of 2 technical reference standards in protocols and implementations for entanglement and non-entanglement quantum random numbers of generators (QRNG), i.e. RS-EITCI-QSG-QRNG-PROTOCOLS-STD and RS-EITCI-QSG-QRNG-IMPLEMENTATION-STD.

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

Yes, I wrote technical specifications.

What future efforts or activity are still necessary in your area of application?

Only few years ago the European Commission launched EuroQCI, a large-scale program implemented by all EU member states, targeted at building quantum terrestrial & satellite network acting as an infrastructure for quantum systems developed in the EU's Quantum Flagship program and prospectively for anticipated quantum computers. In 2019/2020 two important breakthroughs have been reported by Google (USA) and USTC (China) with the so-called quantum supremacy of quantum processors (Sycamore implemented on superconducting Josephson junctions and Jiuzhang built on entangled photons), able to solve real problems beyond the reach of classical computational power.

The advent of quantum computers pronounces the need to further develop quantum standards and especially so in the quantum cryptography domain enabled by the QRNG. The QRNG standardisation efforts need to be further pursued to mature on a similar level as are the standards for the QKD to jointly provide quantum security for the future of communication.

Online references related to the fellowship work

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

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

www.nature.com/articles/s41598-019-56706-2

Advanced Standards for the AI Assisted Smart PV

Agnieszka Rządkowska

Chair of the European Solar Network, International Policy Director for Smart Energy Systems, the European IT Certification Institute European Solar Network

Belgium

Sector

Smart Grids and Smart Metering

Engaged SDOs, WGs and TCs

EITCI SMART-PV-SESG Smart Energy Standards Group
CENELEC / IEC-TC CLC/TC-82 Solar photovoltaic energy systems 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)

Role

Chair of EITCI/ESN Smart Energy Standards Group (SESG) and AI Assisted Smart PV WG

Addressed EU standardisation priorities and gaps

The main gap in the current standardisation efforts is lack of defining standards on directly applying AI to smart PV systems. Accordingly with the EU Rolling-Plan 2020 ICT standards in energy are focused on smart grid management, grid-balancing, and devices interfacing. Dynamically growing smart PV market sees however a lot of AI-based innovation for solar cells from multiple vendors. Relevance of continued efforts upon this engagement concerns the EU Rolling-Plan 2020 for ICT standardisation overviewing needs for digital standards in support of the EU policy for Smart Grids and Smart Metering, with a direct focus set on AI enabled smart PV solar systems. The work aims at further technical aspects detailing of reference standardisation efforts for many already identified domains of AI applications to PV systems (in terms of AI assisted optimisation of solar cells designs and production phases, planning of optimal solar cells systems deployments and optimization of solar cells operation in smart power grids systems).

Concerned ICT Standards and contribution to the related landscape

My fellowship's contribution is in advancing reference standards development combining recent progress in Artificial Intelligence based on neural networks and machine learning with management of renewable energy generated in grid-connected photovoltaic (PV) systems along with their operation-and-maintenance (O&M) and their smart on-grid integration and control. Continued standardisation efforts in smart PV assisted by AI is expected to contribute to growing digital energy standards inventory and support uptake of AI assisted smart energy technologies of crucial importance for the EU climate and energy policy framework, especially in view of recent emphasis on joining digital agenda and green agenda as two major pillars for the EU development strategy. Continuation of standardization efforts aims at defining higher level of abstraction for possible domains of the state-of-the-art AI applications in smart PV systems of all scales (from residential installations to PV power plants). The continued work aims at the technical development of the SESG accepted technical reference standards.

The efforts also address integration with other developed standards for smart energy and smart grids.

Impact (on European SMEs, related project or in the society)

Impact on SMEs

The activity of the SESG WG is implemented in a cooperation between the European Solar Network (a non-profit association of ca. 280 individual members and 15 institutions of which the applicant is a cofounder) and the EITCI Institute. I am also as Board Member of the International Solar Energy Society, and I have involved into the project this UN-accredited international solar energy association, the oldest and the largest of such associations (formed in 1954 and active in +110 countries with members counted in thousands, including representatives of science, engineering, industry and policymaking). The main scope of this cooperation is in dissemination and inviting experts to join WG activities and support iterations of the RFC/RS drafts preceding standards acceptance (including RFC/RS on AI enabled smart PV definitions, concepts, architectures and use cases, as well as on AI Smart PV technical specification of processes and devices upon planned technical advancement).

Impact on Society

Global warming caused by the greenhouse effect has been proven as a scientific fact. Its dynamics are increasing and the policy makers, with the EU taking a leading role, define decisive strategies as critically required to counter the situation.

Since the energy production sector dominates contribution to greenhouse gases emissions it is well known that the renewable, clean energy transformation is one of top priorities.

In this context both PV systems and the electricity grids are of key importance. In 2012 electricity represented 22% of the EU's energy consumption with renewables accounting for a share of 24% of gross production. Less than a decade later, in 2021, renewables have for the first time dominated traditional fossil fuels in the energy mix for electricity production in the whole EU, combined with an impressive relative growth of the solar energy share.

The societal impact of the AI assisted Smart PV standardisation is in further supporting of the clean energy transition. This may be significantly supported by the digital technology (mainly AI), and it also gains another dimension as a factor of the energy security (by reducing dependencies on the geopolitically conditioned natural resources), becoming an especially pressing matter during the escalation of the energy crisis in Europe caused by the war in Ukraine and the Russian aggression.

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

The action led to further development of technical reference standards of the EITCI SESG: 1) in AI Smart PV systems definitions, concepts, architectures and use cases, and 2) in AI Smart PV technical specification of processes and devices.

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

Yes, I have drafted technical specifications.

What future efforts or activity are still necessary in your area of application?

Material science is one road to increasing efficiencies to costs ratios of solar cells. New developments lead to SC devices in single-junction technology reaching on average ca. 25% efficiency.

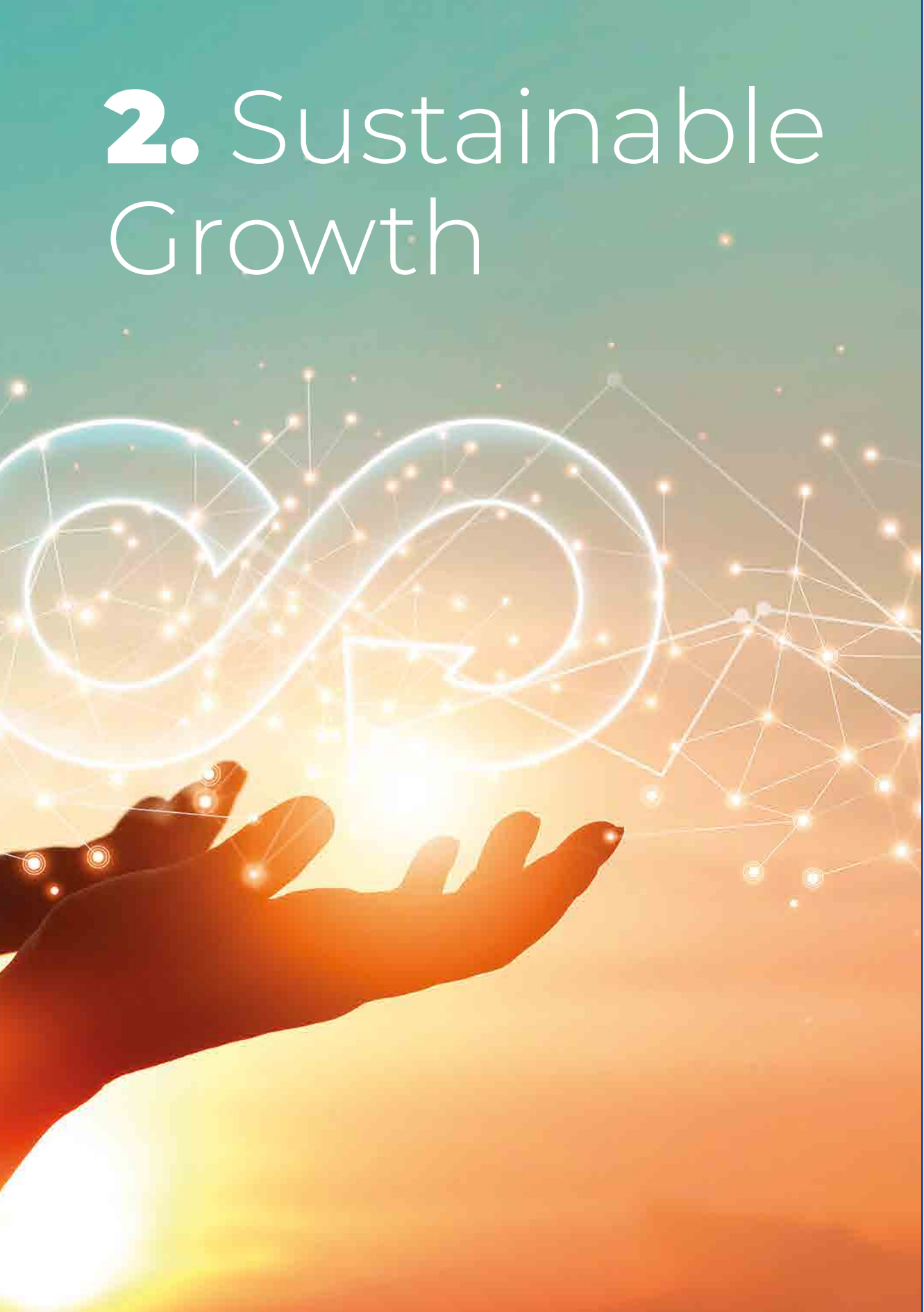
Another way to make solar cells more efficient is to combine them with advances in digital technologies and most importantly with AI. The current action's developed standards identify preliminarily concepts, architectures and use cases for AI in Smart PV systems, along with

further technical specifications of processes and actual systems. It is clear however that for an industrial adoption these standards have to be further developed towards increasing technical detail level upon experts' cooperation. With multiple companies developing proprietary technologies utilizing AI in PV systems to increase efficiencies of energy conversion and electric grid integration, a consensus is present among experts that the technology requires sustained efforts in standards setting to develop jointly further.

Online references related to the fellowship work

- https://eitci.org/technology-certification/sesg
- https://eitci.org/smart-energy-standards-group.pdf
- https://eitci.org/technology-certification/sesg/smart-pv
- https://eitci.org/technology-certification/sesg/smart-pv/eitci-sesg-smart-pv-concepts
- https://eitci.org/technology-certification/sesg/smart-pv/eitci-sesg-smart-pv-technical

2. Sustainable Growth



Circular ICT: global digital sustainable product passports for ICT goods

Leandro Navarro
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Spain

Sector

Circular Economy

Engaged SDOs, WGs and TCs

Itu SG5 Environment, climate change and circular economy / Q7
E-waste, circular economy and sustainable supply chain management

Role

Co-rapporteur

Addressed EU standardisation priorities and gaps

My fellowship addressed several priorities and gaps:

- The UN Aarhus convention and the related Escazu agreement recognise environmental rights related to access to environmental information, as well as the need for mechanisms to render these rights effective. Digital devices and related elements ranging from materials to e-waste are a significant part of our environment. For all that we need reliable data.
- The circular economy (CE), and the term circularity, is about "designing out waste and pollution, keeping products and materials in use, and regenerating natural systems". In the context of digital devices, circularity aims at achieving the best use of devices with maximal lifespan, that helps decarbonising the environment.
- Access to digital data, such as linked data, with access to lists, datasheets, manuals, and guides, can facilitate and automate tasks.
- Access to digital data about devices can help diverse organizations to exchange and aggregate data records about models and devices to produce factual/empirical data related to circularity.
- Relevant information can be about materials, design, usage, maintenance, repair, their parts, ways to dismantle and recycle them. That can be extended to specifications, programming, firmware, and software to allow maintenance and usage.
- Raw materials, that include scarce materials, secondary materials, and the negative social and environmental risks from hazardous substances, deserve special attention and require environmental responsibility from everyone in the supply chain that relies on detailed data.
- Having all this information related to sustainability and specifically about circularity in digital and standardised format can bring qualities, facilitate, and improve many processes, as well as allow citizens, organisations, governments to assess their environmental footprints and other statistics about the digital/ICT sector.

Concerned ICT Standards and contribution to the related landscape

The work of this fellowship relates to and builds on existing known digital data formats, linked data, and system architectures, as well as relates, supports, and complements upcoming regional legislative initiatives (European digital product passport) and global (ISO PCDS, IEC 82474-1) standards.

The scope of this work is the definition of requirements and initial data proposals for the reporting of details about digital technology products in digital format in the scope of a "digital product passport" with a focus on circularity and transparency about environmental and climate change aspects.

The standardisation work takes place in ITU-T as editor of the standards related to the requirements for a global digital sustainable product passport (i.e., L.GDSPP).

Impact (on European SMEs, related project or in the society)

Impact on SMEs

Digital Product passports are in the process of becoming a requirement in the EU, which on one side requires most actors of the circular economy of ICT devices to comply with it, but on the other side, it brings an opportunity to European SMEs to develop new activities and offerings to comply and digitalise this new requirement from the EU. It is expected that these effects will spread over the world, bringing SMEs a global opportunity, with a lead over other regions.

Impact on Society

The circular economy and its digital transformation can be viable solutions to achieve the climate change mitigation goals fixed for the ICT sector. The definition of requirements for a digital product passport for ICT products from a sustainability and circularity viewpoint are crucial, and it is necessary to facilitate the adoption of related legislative initiatives globally.

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

Yes, as co-rapporteur of Q7/SG5 and editor of the L.GDSPP item, this fellowship has led the progress of this work item towards a new standard, with global scope in ITU and EU scope from the technically aligned work with ETSI.

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

Yes, I have drafted several work documents, among a technical report on recommendations for new standards.

What future efforts or activity are still necessary in your area of application?

The engaged actions should be continued, as there are details to complete to reach a final text for the consent of the recommendation. New standardisation work items may raise, in the context of Digital product passports for more sustainable ICT products, as a result of this essential result in L.GDSPP.

Online references related to the fellowship work

www.itu.int/net4/ITU-T/lists/loqr.aspx?Group=5&Period=16

ISO/TC 323 “Circular Economy”

Julian Lauten-Weiss
PhD candidate; Bergische Universität Wuppertal
Germany

Sector

Circular Economy

Engaged SDOs, WGs and TCs

ISO/TC 323/WG 1 Circular economy — Framework and principles for implementation, ISO/TC 323/WG 3 Circular economy — Measuring circularity framework

Role

Member

Addressed EU standardisation priorities and gaps

The main gap I was able to address was the lack of experts that were able to dedicate enough time to the concerned standards. As the CE is turning out to be a highly complex and at the same time contentious issue, there frequently are significant changes to the draft documents which require reviewing and often revising, at least from a scientific perspective. Some more experienced Standardisation experts have even expressed that they have never witnessed a similarly intense process. Thanks to the StandICT.eu 2023 funding, I was able to treat my work with DIN and ISO as a job rather than a volunteering activity, allocating more time and energy to it than most experts. Concretely, this enabled me to participate in a total of 29 meetings/workshops and in addition spend over 30 hours on tasks such as supporting more experienced experts in preparing proposals for entire chapters.

Strengthening the German delegation in turn also strengthens the European position on the international level, as the DIN group of experts strongly supports the European Green Deal and the strategic goals related to it. This includes the transition to a Circular Economy (EC) while protecting the climate as well as biodiversity which are goals not unanimously upheld by international CE Standardisation experts.

Concerned ICT Standards and contribution to the related landscape

Throughout the past six months of this fellowship, I actively participated in meetings and discussions at the national (DIN) as well as international (ISO) level, sharing my own knowledge and experience but also advocating for German and European positions within ISO’s technical committee (TC) 323 on the circular economy (CE). In addition, I reviewed working documents, compiled scientific knowledge, and prepared proposals for changes to the standards in development. These activities led to discussions among German and international experts and were, in many cases, integrated into the current documents.

My work mainly revolved around ISO 59004 (Framework and principles for implementation) and ISO 59020 (Measuring circularity framework) currently in development by ISO/TC 323.

Impact (on European SMEs, related project or in the society)

Impact on SMEs

By supporting the alignment of the CE standard with European goals and values, my contribution impacts European SMEs by creating a more uniform direction for their

sustainability transformation. My experience with circular business models and sustainability consulting also enables me to simplify overly complex proposals and uphold a user-focused perspective that will benefit SMEs globally that are looking to the standards developed in ISO/TC 323 for guidance.

Impact on Society

One of the main aims of my work is to help move the CE standards in development towards frameworks for a sustainable and circular economy. This includes paying attention to where CE actions may lead to increased greenhouse gas emissions, biodiversity loss or negative social impacts and (co-)developing guidance, provisions, and requirements to avoid such unwanted effects. When implemented successfully and in accordance with the latest scientific knowledge, CE standards can have far-reaching impacts on how goods and services are produced, leading to lower resource consumption and in turn to a lower burden on our environment.

On a smaller scale, my work increases the representation of millennials in the world of Standardisation which is important as there are only a few experts under the age of 30 and this underrepresentation might lead to certain aspects getting less attention such as a longer-term view of sustainability-related issues.

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

Yes, this fellowship supports a range of standards already under development within ISO/TC 323.

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

Yes, I have drafted technical specifications.

What future efforts or activity are still necessary in your area of application?

While a lot of work has been done already, the results are not satisfactory yet. I as well as other German experts advocate for more communication, especially in ISO/TC 323 WG 1 which routinely deals with hundreds of comments that are only discussed superficially even though the differences between positions often lie in the details. Additional EU experts are needed to work towards a more unified European position that will carry weight on the international stage.

Online references related to the fellowship work

- www.iso.org/committee/7203984.html
- www.standict.eu/discussion-groups/circular-economy/316/overview-ce-standardization-activities
- www.standict.eu/discussion-groups/circular-economy/316/top-5-circular-economy-journals

ISCC – International Standard Content Code

Sebastian Posth
Expert, ISCC Foundation
Netherlands

Sector

Building Trust

Engaged SDOs, WGs and TCs

IETF

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

Role

Convenor of ISO/TC 46/SC 9/WG 18

Addressed EU standardisation priorities and gaps

The gap of this fellowship concerns the fact that currently, there is no content-derived identifier standard for digital media assets with content matching capabilities. My priority is to drive the decentralised content identification that is a major innovation for the media industries and the creative community.

Concerned ICT Standards and contribution to the related landscape

With this fellowship, I am mainly working on the ISO/AWI 24138 International Standard Content Code (ISCC) that a new identifier for digital media assets. The ISCC can help creative individuals and media organisations as well as online platforms to better manage digital media assets. This fellowship enables me to integrate the demands and requirements from stakeholders of various sectors in the media industries.

Impact (on European SMEs, related project or in the society)

Impact on SMEs

Media organisations are facing the problematic situation that an ever-increasing amount of digital content is managed by large, mostly US-based corporations. In lack of an international standard those corporations use their own proprietary identifiers (Amazon ASIN, Google GKey/Content-ID, Apple-ID etc.) to manage publisher or user generated content. This is inefficient, costly and creates and vendor lock-in. Media organisations are forced to use the proprietary identifiers for content exchange, accounting, and management under authority of the platforms, thus cementing the dominant position of the gatekeepers. Novel regulation that is explicitly designed to deal with digital "gatekeepers" (DSM, DSA, DMA), decentralised ledger technology and open-source software as well as new and innovative open, transparent standards for content identification will likely support a development towards more heterogeneous marketplaces and an open Internet that will benefit its users as well as the creative and cultural communities.

The ISCC is designed as open identifier standard to manage digital content in decentralised media environments. This is a fundamental prerequisite for efficient or automated content licensing transactions online. The ISCC will support SMEs, i.e., creators, media organisations, retailers, platforms, collecting societies and other stakeholder from all media sectors in Europe, to provide metadata and rights to copyright protected works, support identification and authentication of original content and prevent misappropriation and abuse online.

ISCC codes, can be generated decentralized without requiring an identifier registration authority and support content exchange, license management and interoperability between IT systems. ISCC fills the gap with a content-derived identifier standard for digital media assets. It's a major innovation for the media industries and the creative community. Stakeholders (SMEs, CMOs, CROs, membership organisations) from various countries (Germany, Italy, Finland, France, Austria etc.) and different sectors of the content and media industries (book/academic publishing, TV/film/photo) are already investigating the proposal, developing prototypes of application, and supporting the development of the ISCC on Github.

Impact on Society

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

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

Yes, I have contributed to ISO/CD 24138 – International Standard Content Code (ISCC) is a new standard that was initially accepted as PWI in May 2019. The new standard is scheduled to be published early 2024.

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

Yes, the project ISO/CD 24138 – International Standard Content Code (ISCC) is now at stage 30.60 (International harmonized stage codes. The standardisation process is going according to the plan.

What future efforts or activity are still necessary in your area of application?

The next steps of the standardisation process are:

- Including feedback from the Committee Draft (CD) ballot in the draft document.
- Finalising and register the Draft International Standard (DIS) (stage 40.00,).

Online references related to the fellowship work

https://iso.org/standard/77899.html

https://iso.org/stage-codes.html

Contribution to European ICT standardization strategy and participation in ETSI governance bodies

Angel Boveda
Managing Director, WIRELESS PARTNERS S.L.L.
Spain

Sector

Industry 4.0

Engaged SDOs, WGs and TCs

ETSI TC Digital Enhanced Cordless Telecommunications (DECT)
ETSI Board Technology Radar for Emerging New Domains (TREND)

Role

Board Member

Addressed EU standardisation priorities and gaps

As part of this fellowship, I have contributed to the technical study done at BOARD TREND on user-operated wireless networks, that automatically addresses the several scenarios where these networks are crucial and where current standards gaps need to be filled. One example of such scenarios is advanced manufacturing (Industry 4.0) where current user-operated technologies cannot provide the required needs in terms of latency and reliability. But also, smart grids and metering, smart home and building automation and technologies for the content industry (PMSE) suffer significant gaps and will benefit from new standards in the area. My participation in Governance has addressed the implementation of the EU standardization strategy in ETSI.

Concerned ICT Standards and contribution to the related landscape

As ETSI Board Member, I have contributed to two critical areas for the future of the European ICT standards landscape:

- I actively participated in the ETSI BOARD TREND, a strategy group in charge of outlining the expected trends in ICT to be addressed by ETSI during the forthcoming years. The conclusions of ETSI TREND are reported in the ETSI Technology Radar White Paper (ETSI WP No.45 rev 2022). I was the author of the chapter "user-operated wireless networks" that describes the evolution of these types of technologies.
- I have also participated in the BOARD Governance group, a group in charge of outlining the required changes in ETSI governance rules to address the concerns reported by the European Commission.

Impact (on European SMEs, related project or in the society)

Impact on SMEs

I fully support the European SMEs and appreciate their relevance as part of the ICT ecosystem. At the ETSI Governance Board I am one of the members that are supportive of SME interest, and I have made the proposals to improve the situation of the SMEs. I formulated the following recommendations:

- Doubling the voting power of SMEs to 2 votes instead of one as currently.
- At the ETSI GA, allow small members to proxy their voting rights to other members without the current limitation of 3 proxies: instead of it, establishing a limit based on UoC, which is more favourable for SMEs.
- Reducing the voting power of large members by means of an exponential equation.
- Reducing the voting power of large members in a way a single member cannot have more than 20% votes in a given TB (co-author).
- Increasing the voting power of administrations.

Impact on Society

My participation at Board TREND addresses the societal impact and supports the public policies intended to ensure a smart, sustainable, and inclusive growth.

My participation at Board Governance group has addressed the societal impact and has supported the public policies of Inclusiveness, especially for SMEs in Industry 4.0. Also, this group oversees outlining the required changes in ETSI governance rules to address the concerns reported by the European Commission.

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

Yes, In ETSI BOARD TREND I have recommended increasing the effort in European user-operated radio networks by creating new standards for the topic.

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

Yes, I have contributed to a technical report; ETSI White Paper 45 rel 2022 (Technology Radar).

What future efforts or activity are still necessary in your area of application?

Regarding technology strategy, I recommend continuing the effort and implementing my recommendations at Board Governance. This may be done by tasking ETSI to develop Both topics: governance and Technology trends will continue to be strategic priorities soon. Governance actions requires continuous contribution to overcome inertia and business interests.

Furthermore, I recommend continuing the effort and implementing my recommendations at Board TREND. This may be done by tasking ETSI to develop specific standards in the field of wireless networks, and the support of the European Commission would be crucial.

Online references related to the fellowship work

www.etsi.org/committee/dect

Further standardization tasks for the protection of Vulnerable Road Users

Michelle Wetterwald

Independent Standardisation expert in networking and Mobile communications Expert

France

Sector

Intelligent Transport Systems

Engaged SDOs, WGs and TCs

ETSI TC Intelligent Transport Systems (ITS) / WG1

Role

Member

Addressed EU standardisation priorities and gaps

My fellowship contributes to TC ITS that started standardising Cooperative-ITS (C-ITS) technologies in 2008. Since then, it has developed several facilities (service) layer entities serving ITS applications to help prevent vehicle hazards in diverse situations, including Position-Time, Cooperative Awareness, Event Notifications or In-Vehicle Information. The VRU awareness standard was developed in three parts which were last revised and published in April 2021 (part of my OC-1 fellowship). From the beginning, the VRU topic generated a lot of discussions and comments, internally during ETSI meetings and from external stakeholders interested in the topic.

The published standards are considered as stable; however, several industrial delegates were willing to refine ETSI TR 103 300-1 that describes VRU-related use cases.

As the project for the revision work was approved, the committee named the former rapporteur to continue this work and ensure that the upcoming set of standard sub-parts remains consistent. Two other standards under preparation at TC ITS also impact the VRU standard or are impacted by this work: the Collective Perception Service (CPS) where vehicles and infrastructure share their sensed knowledge about their environment, and the ITS Common Data Dictionary (CDD) which specifies the detailed format and meaning of each and every data element used in the ITS cooperative messages to ensure interoperability between ITS devices.

Concerned ICT Standards and contribution to the related landscape

The contributions of this fellowship will enhance the capability of ETSI standards to improve European citizens' safety and prevent injuries and fatalities on roads (ETSI TC ITS). Vulnerable Road Users or VRUs (pedestrians, cyclists, motorcyclists, large animals) account for a large percentage of road fatalities. The ETSI VRU standard is the most comprehensive standard on that topic published so far.

I led the team that prepared a standard (ETSI TS 103 300) for Intelligent Transport Systems (ITS) VRU awareness in three parts: (1) Use Case, (2) system architecture and (3) service specification. All three sub-parts of this standard were finalized, mainly checking consistency as part of the StandICT.eu2023 OC-1 fellowship. The present fellowship aims at including further use cases in Part 1 (TR 103 300-1) and evaluate their impact on the standard. It also

aims at supporting other related activities, such as the revision of the ITS Common Data Dictionary which will be the core of all the TC ITS message set and ensuring harmonization with the Collective Perception Service standard.

Impact (on European SMEs, related project or in the society)

Impact on SMEs

The ITS domain is a very varied eco-system, where SMEs can contribute. Especially since the work in this fellowship takes place at service level, there are several SMEs which develop the software and commercialize it to support the ITS exchanges. So, even if the direct contributors in the discussions are large companies, SMEs are indirectly impacted by these actions as they will be able to develop new services complying with these standards.

Impact on Society

This work supported the protection of Vulnerable Road Users (VRU) through the edition of a standard in the cooperative ITS domain, directly with the VRU standard and indirectly with the CDD and Collective Perception Service where I gave a hand to the standard rapporteurs. The initial target of cooperative ITS (C-ITS) was on motorized transport (mainly cars, trucks, etc.). However, Vulnerable Road Users or VRUs (pedestrians, cyclists, motorcyclists, large animals) account for a large percentage of road fatalities. To enable the European objective of zero fatalities by 2050, it is important to extend C-ITS to protect the VRUs when at risk on the roads. From the beginning, the VRU topic generated a lot of discussions and comments at ETSI, internally during meetings and from external stakeholders interested in TC-ITS and has become an important societal topic in many worldwide organizations, up to the UN that organized High-Level Meeting on Global Road Safety on June 30, 2022.

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

Yes, this work will trigger the revision of Part 3 of the VRU standard to implement the corrections discussed with early implementers and to reflect the changes due to the editing of the ITS Common Data Dictionary.

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

Yes, I have drafted technical report on recommendations for revised standards as well as technical specifications.

What future efforts or activity are still necessary in your area of application?

I will continue the engaged work beyond the 6-month duration of the present fellowship, I will notably prepare a final version of draft TR 103 300-1 and present it at the TC ITS WG1 meeting # 61 (October 2022). Also, I will continue supporting VRU-related activities (Release-2 CDD, CPS and Release 2 BSA standards).

Online references related to the fellowship work

www.etsi.org/committee/its

3. Innovation for the Digital Single Market

Consensus mechanisms: state of the art and user cases

Stéphane Caporali
Consultant – expert, Caporali Conseil
France

Sector

Blockchain

Engaged SDOs, WGs and TCs

CEN-CENELEC Sector Forum Energy Management and Energy Transition (SFEM)
ISO/TC 307 Blockchain and Distributed Ledger Technologies

Role

Member

Addressed EU standardisation priorities and gaps

The challenge that this fellowship addressed concerns the European ecosystem that is made up of as many large public blockchains such as EBSI as well as a multitude of small public and private blockchains, which require architectural choices for which the choice of the consensus mechanism and the use case concerned are not independent.

The addressed priority is to enable the innovation to enter the digital single market. The idea is to create a blockchain project implementation methodology available to European project leaders, to facilitate the arrival of new market entrants. The methodology alone is not enough, it must be accompanied by a segmentation by use case, considering the choice of the consensus algorithm.

Concerned ICT Standards and contribution to the related landscape

The two standards involved are ISO/TC 307 and CEN/CENELEC SFEM.

One of the objectives of the SFEM working group is to define needs for Standardisation in the field of energy. The group is made up of experts from the energy sector. I am not an expert in the energy sector, but I have experience of the ISO/TC 307 process allowing me to help them in expressing their standardisation needs.

Impact (on European SMEs, related project or in the society)

Impact on SMEs

The lack of internal expertise puts SMEs in the need to be supported by the help of the standard, especially in the project methodology and the relationship with the blockchain service provider. In addition, a more precise segmentation by use case is an additional help. The case of the energy sector is a good example to initiate this approach, because it is affected by blockchain technology in different ways: from a financial point of view in the case of an energy service provider, but at the same time for IoT with specific consensus mechanisms such as DAGs or PoET.

Impact on Society

A clear and well-constructed standard will allow blockchain technology to be accessible to a wider audience.

What future efforts or activity are still necessary in your area of application?

Standardisation needs will be expressed by the end of 2022 by the experts of the SFEM group. As a second step, the support of these recommendations to defend European interests will be necessary in the different SDOs, notably among ISO and other SDOs that may be interested in the needs as will be expressed by the SFEM.

Different European experts with expertise on the sharp and technical subject of consensus mechanisms in key positions in different SDOs (including CEN-CENELEC) will be desirable.

Online references related to the fellowship work

www.cencenelec.eu/areas-of-work/cen-cenelec-topics/energy-efficiency-and-management/cen-cenelec-sector-forum-energy-management-energy-transition-sfem/

Contribution to Identity Management Standards at ISO/TC307 and CEN-CENELEC/JTC-19

Jerome Pons
Founder & CEO, Music won't stop
France

Sector

Blockchain

Engaged SDOs, WGs and TCs

ISO TC307 Blockchain and distributed ledger technologies / WG1 Foundations

Role

Member

Addressed EU standardisation priorities and gaps

The addressed gap concerns the unharmonised terms within national, European & worldwide works (e.g. "attestation", "accreditation", "claim", "credential", "custodian" vs. "guardian", "identity holder" vs. "identity prover", "subject" vs. "principal"), lack of definition in standards for some terms (e.g. "decentralised identity");

The priority of this fellowship is ISO/TC307/WG1 prioritised over ISO/TC307/JWG4, ISO/TC307/WG6 and CEN-CENELEC/JCT-19/WG1; national works (AFNOR, UNE) and European works (EBSI, eSSIF-Glossary) prioritised over worldwide ones.

The challenges are related to the difficulties retrieving some English terms (e.g. Alastria ID); some standardisation works are not enough shared between working groups (e.g. ISO/TC307/WG1 does not access UNE and CEN-CENELEC/JTC19/WG1 works and CEN-CENELEC/JTC19/WG1 does not access ISO/TC307 works) so that sharing through joint meeting or liaisons is highly recommended.

Concerned ICT Standards and contribution to the related landscape

The targeted standards are ISO 22739:2020 led by ISO/TC307/WG1, ISO AWI 7603 led by ISO/TC307/JGW4, ISO DTR 6039 led by ISO/TC307/WG6 and CEN-CLC TS "Decentralised Identity Management Model" led by CEN-CENELEC/JTC19/WG1.

This fellowship contributed in three main aspects. Firstly, I analysed the "decentralised identity" terminology of 50+ standards and reference documents, then selected 18 works including:

- 3 national works (French Ministry of Interior white paper on blockchain and identity (BCID), UNE 71307-1:2020 "Decentralised Identity Management Model" i.e. CEN-CENELEC/JTC19/N72, Aston / Cardiff Universities paper "Your Identity is Yours");
- 2 European works (EBSI "Terminology", eSSIF-Lab "Glossary");
- 13 worldwide works (ISO 22739:2020 and ISO CD 22739 revision, ISO DTR 6039, ISO AWI 7603 work item, ISO/TR 23249:2022, ISO/IEC 24760-1:2019, ITU-T X.1252 and X.1403, NIST paper "Emerging Blockchain Identity Management Systems", W3C DID, W3C VC, Sovrin "Glossary V3", INATBA "Glossary").

Secondly, I proposed harmonised terms in ISO CD 22739 revision, based on DiCoDaMo inputs. And, thirdly I proposed some updates to standardisation work documents, mainly to ISO CD 22739 and the AFNOR French translation of ISO 22739:2020.

Impact (on European SMEs, related project or in the society)

Impact on SMEs

As European SMEs are subject to stronger regulation (e.g., eIDAS, GDPR, Copyright), finetuning worldwide standards is essential. The European terms related to identity management were finetuned in the ISO 22739:2020 revision (e.g., identifier, identity, identity holder, self-sovereign identity (SSI)). I proposed the French Ministry of Interior definition of SSI, co-written with AFNOR experts, to ISO/TC307/WG1. All European SMEs will take advantage of such finetuning.

Impact on Society

ISO/TC307 technical committee contributes with 14 standards to the following Sustainable Development Goals (SDGs) defined by the United Nations, to "Industry, Innovation and Infrastructure" as well as to "Responsible Consumption and Production".

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

Yes, I contributed to the revision of a standard already under development (i.e. ISO CD 22739 revision).

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

Yes, I drafted technical specifications.

What future efforts or activity are still necessary in your area of application?

I will continue the engaged work in a new fellowship under the open call 7. This contribution will allow further harmonising "decentralised identity" terms within ISO/TC307 standards (i.e. ISO CD 22739, ISO AWI 7603 and ISO CD TR 6039). The harmonisation of terms related to identity management should be pursued and consolidated at CEN-CENELEC/JTC19/WG1 to fully integrate European stronger regulation (e.g. eIDAS2 revision and associated identity wallet), thus giving European SMEs a competitive advantage (quality of standard and regulation) thus reinforcing the European sovereignty on blockchain (including self-sovereign identity and EBSI infrastructure).

Online references related to the fellowship work

https://norminfo.afnor.org/structure/afnorcn-blockchain/commission-de-normalisation-blockchain/123293#membre

www.iso.org/committee/6266604.html?view=participation

Privately-lead enforcement on DLT assets

Dimitar Kyosev
Compliance officer, Alis Grave Nil LTD.
Bulgaria

Sector

Blockchain

Engaged SDOs, WGs and TCs

ESMA

Consultative Working Group (CWG) advising Investor Protection and Intermediaries Standing Committee (IPISC).

Role

Member

Addressed EU standardisation priorities and gaps

In this fellowship I am addressing the Digital Transition Challenge and the gaps of the commons. Creditors must have a revenue to collect their dues, otherwise there would be no extension of credit - which would make the modern economy impossible. Digital assets are technologically different from electronic or physical assets, therefore the satisfaction of creditors from digital assets needs to have different structure. This is additionally complicated when we talk about cross-border claims, which is the most likely scenario for the fluid and dynamic digital assets. Therefore, finding a principal solution is of a substantial significance for a digital economy with multitude of crypto assets that underpin innovative business models. Adding to the challenge description above, what is needed is to strike the right balance between protection of creditors and debtors. Further, special emphases must be put on the issue of security protocols, as well as the need for instantaneous settlement. Further issues of death of users, disputes, and costs need to be addressed in appropriate manner.

The gaps of the commons refer to the situation that certain phenomena are so wide-spread that individual projects are not usually interested in dealing with it. An excellent example is inheritance (secession), where it is common knowledge that at some point all digital assets will need to be inherited. However, there are very few commercial projects that tackle the issue and those that do make ad hock decisions. Those gaps present a roadblock towards wider adoption of the crypto assets.

The gaps in the ICT standards for DLT, when talking about private enforcement are considerable as things stand. They include information gaps, stay on assets and other protection measures as well as executability of court orders.

Concerned ICT Standards and contribution to the related landscape

The ICT Standards in DLT are envisioned as a set of voluntary actions (see the EU Strategy and the Digital Europe Response to it). As such, this fellowship is dealing with the integration of a DLT standard with existing compliance issues (e.g. enforcement of judicial rulings).

As part of this fellowship, I am working on a standard recommendation related to 7 key areas:

- Area 1: Uncontested claims - cross-border claims by creditors of the asset holders that have been settled by court, arbitrage, or administrative body.
- Area 2: Creditors' claims - domicile claims by creditors.
- Area 3: Preservation of assets - temporary freeze on part of the crypto-assets until a claim is adjudicated upon; protections for debtors.

- Area 4: Succession - general recommendation for dealing with inheritance of crypto-assets.
- Area 5: Maintenance - non-contractual dues for ex-spouse, minors, or other care taking duties.
- Area 6: Dispute resolution - fair protection for users; lowering of costs and time of disputes resolution.
- Area 7: Fees - general recommendation on fees structure and administrative upkeep.

Impact (on European SMEs, related project or in the society)

Impact on SMEs

With the upcoming adoption of the Digital Euro and other CBDCs (Central bank Digital Currencies) the European SMEs would need a voluntary standard to easily adopt to be able to facilitate transactions and subsequent private enforcement from around the Union. I would argue that the standard I work on is key for the EU Digital Transition (which has its emphases on SMEs, as the Commission makes clear) in medium term.

Impact on Society

This work contributes to the general objective of Economic Transformation; the EU has set itself the objective of maintaining and developing an area of freedom, security and justice, in which the free movement of persons is ensured. To that end, the EU must adopt multiple measures in the field of judicial cooperation in civil matters that are necessary for the proper functioning of the internal market. The principle of access to justice is fundamental and, with a view to facilitating better access to justice in a digital future, an approach replicating the achievements of the EU legal order (acquis Communautaire) is needed.

Through the standard recommendations, coherent, non-conflicting, and unified rules would benefit the development of innovative business models and digital products also for the benefits of society at large.

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

Yes, I have developed recommendations for the adaptation of the EU legislation on private enforcement for the technical specifications of DLT; in that sense I claim those are recommendations for a new voluntary standard to be developed, since the current off-chain standards are simply not applicable for the new technology.

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

Yes, I have developed recommendations for new standards.

What future efforts or activity are still necessary in your area of application?

Following the response of the stakeholders as I studies in this fellowship, I could claim that there is a clear need for such standardisation effort, and that the stakeholders want to concentrate on their core business and are not wedded to their home jurisdiction as adjudication jurisdiction. In that sense, developing detailed standard for one selected jurisdiction would be acceptable for the stakeholders. However, they would also have strong preference towards merger of legal and technical solution in one - where a product answering that need is developed. This is the action that should be continued - selection of most suitable jurisdiction, detail rules for that jurisdiction based on the standard recommendations and building a product that can be used by stakeholders.

Online references related to the fellowship work

https://ottct.com/private-enforcement-on-dlt-assets/

Global blockchain and DLT standards on Security, Privacy, Identity

Julien Bringer
CEO and expert, Kallistech
France

Sector

Blockchain

Engaged SDOs, WGs and TCs

ISO/TC 307/JWG 4 (co-convenor): Joint ISO/TC 307 - ISO/IEC JTC 1/SC 27 WG: Security, privacy and identity for Blockchain and DLT
ISO/TC 68/SC 2 Financial Services, security (liaison representative of TC 307)
ISO/IEC JTC 1/SC 42 Artificial Intelligence (liaison representative of TC 307)
CEN/CENELEC JTC 19 Blockchain and Distributed Ledger Technologies
ISO/IEC JTC 1/SC 27 Information security, cybersecurity, and privacy protection

Role

Co-Convenor of ISO/TC 307/JWG 4

Addressed EU standardisation priorities and gaps

The development of internationally recognised blockchain and DLT standards is a key promise of ISO/TC 307. Even if Europe is very active with dedicated EU initiatives, given the global deployment and impact of these technologies, TC307 is expected to be the global venue for leading such standards. It is thus of great importance to ensure EU is actively represented in this committee and that liaisons with other ISO or CEN/CENELEC groups in which EU experts are already strongly active are efficiently leveraged. The proposed activity targets security, privacy and identity topics in the context of global standard governance.

Concerned ICT Standards and contribution to the related landscape

As a part of this fellowship, I guide the development of the needed standards in Blockchain and DLT area (ISO/TC 307) connected to the existing landscape of security, privacy, and identity standards (ISO/IEC JTC 1/SC 27) and useful for European market, in Fintech/RegTech area, management of identities, and privacy-sensitive applications. This fellowship activity includes all the security, privacy and identity standards developed in ISO/TC 307; for instance, related to cybersecurity requirements and assurance of blockchain/DLT systems, decentralised identity management, and enhanced privacy protection, including the project ISO/AWI 7603 that has started in November 2021.

Impact (on European SMEs, related project or in the society)

Impact on SMEs

Blockchain and Distributed Ledger technologies are developed directly in a global environment and thus the activity impacts EU and SMEs in EU, as for the way EU specificities and regulations (e.g., GDPR, eIDAS, NIS, MiCA) are taken in account as early as possible. Also,

many European SMEs are positioned around decentralised identity, and therefore, future standards on this matter would be key for procurement.

Impact on Society

The use of blockchain technologies enables to increase transparency and brings back more control to the end users (e.g., self-sovereign identity concept).

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

Yes, namely the development of ISO/AWI 7603 has started.

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

Yes, I have drafted several technical reports, notably on reference material.

What future efforts or activity are still necessary in your area of application?

JWG 4 is a major initiative at the intersection of TC 307 and SC 27 for which it is important to pursue efforts in the upcoming months and years, with the new project ISO/AWI 7603 that will take at least two years following the usual standard development. In addition, there are more and more discussions around privacy impact assessment of the use of blockchain tech in applications, as well as the need for security assessment methodologies.

Online references related to the fellowship work

- www.iso.org/committee/6266604.html
- www.iso.org/committee/49670.html
- www.cencenelec.eu/areas-of-work/cenelec-sectors/digital-society-cenelec/emerging-technologies/
- www.iso.org/committee/45306.html

Developing Identity and Trust Standards for Blockchain and Distributed Ledger related Technologies

Paul Ferris
Technical Expert, European Distributed Computing Association
United Kingdom

Sector

Identity Management and Anonymisation

Engaged SDOs, WGs and TCs

ISO TC307 JWG4 ISO/AWI 7603 Decentralized Identity standard for the identification of subjects and objects
ISO TC307 JWG4 ISO//PWI 12833 – Re-identification and privacy vulnerabilities and mitigation methods in blockchain and distributed ledger technologies
CEN/CENELEC liaison with ISO/TC 307 on decentralised identity

Role

ISO Country Technical Expert

Addressed EU standardisation priorities and gaps

The acting project leader has had to stand down from AWI 7603 due to other commitments including, the leadership of CEN/CLC/JTC19/WG01, the perception of a conflict of interest and the availability of an alternative Acting PL. Nevertheless, the redrafting of the project scope to accommodate the actions mandated by N271 is continuing and will enable a contents list to be drafted and the work started on generating a first WD1.

I have been asked to draw up a draft contents list for the project experts to fit in their contributions. It was proposed that I should become the joint editor of the WD1.

Concerned ICT Standards and contribution to the related landscape

I am active in four separate activities within my field in TC307.

I am contributing to ISO/TC307/AWI7603. An example of my work is that the project leader asked me to review over sixty National Body comments and their associated recommendations. I produced an extensive worksheet document that collates the actions on the Project Leader from the Disposition of Comments from AWI7603 NWIP Ballot (ISO/TC 307/JWG 4 N271).

I have contributed to ISO/TC307/DTR6039. I participated in the review of the 69 dispositions of comments from the committee ballot in July. This has led to a redrafting of WD.10 to WD.11 which is currently under review with the ISO editor, prior to the next committee ballot. If successful, it is anticipated that the Technical Report will be published this year.

I am also participating in ISO/JWG4/PWI12833 and contributed to the report provided to JWG4. I have now been invited to take over as project leader. Within JWG4/AWI7603

Meanwhile, I am contributing to CEN/CLC/JTC19/WG01, including discussions that aim to align European and International standards in this important subject.

Impact (on European SMEs, related project or in the society)

Impact on SMEs

The development of an electronic identity system that is adopted in Europe and extends beyond our borders would provide extensive benefits to all in efficiency and security improvements. My contribution is focused on enabling the rapidly developing identity infrastructure EU identity approach to integrate well with the appropriate international standards. Ease of use in this regard is crucial, especially to SMEs with limited resources.

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

Yes, my fellowship contributes to the following standards:

- ISO/CD 6039 Blockchain and distributed ledger technologies - Identifiers of subjects and objects for the design of blockchain: This ISO Technical Report is now at stage 30.60 ISO editorial, and I have contributed to the editorial efforts. The TR is proposed to be published internationally early next year.
- ISO TC307 JWG4 ISO/AWI 7603 "Decentralized Identity standard for the identification of subjects and objects" - This project is at ISO stage 20.00 and has now accepted several of my recommendations which focus the future topic areas of the project and will better align to European values and existing initiatives.
- CEN/CLC/JTC 19/WG 01 "Decentralised identity management", which I have actively contributed and attended the working meetings. The work is preparing our contributions to provide a Working Draft 1.
- ISO TC307 JWG4 ISO/PWI 12833 – "Re-identification and privacy vulnerabilities and mitigation methods in blockchain and distributed ledger technologies" has moved this Potential Work Item investigation to propose up to three future work proposals, within ISO/TC307. These proposals are now being considered at the WG level.

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

Yes, I have contributed to several technical reports related to the before mentioned standardisation items.

What future efforts or activity are still necessary in your area of application?

I will continue my engagement with all the work items mentioned earlier:

- ISO TC307 JWG4 ISO/AWI 7603: This work is due to continue for a further two years.
- ISO TC307 JWG4 ISO/PWI 12833: I have been asked to be the PWI Leader of this initiative going forward, although this will depend on my available resources over the next 18 months.
- ISO/CD 6039: This standard is due for publication, and I will help in its dissemination.

Online references related to the fellowship work

www.iso.org/standard/81978.html

www.iso.org/standard/82842.html

https://digital-strategy.ec.europa.eu/en/policies/blockchain-strategy

Develop European and International technical reports in DLT/blockchain

Caroline Thomas
ISO WG Convenor and Technical Expert, ISO
United Kingdom

Sector

Blockchain

Engaged SDOs, WGs and TCs

ISO TC307 Blockchain and DTL / WG6 Use Cases
ISO TC307 / WG1 Foundational
ISO TC307 / JWG4 Security and Privacy
ISO TC307 / WG5 Governance
ISO TC307 / WG7 Interoperability

Role

Convenor of ISO TC/307 Blockchain and DLT/ Working Group 6

Addressed EU standardisation priorities and gaps

Use cases are relevant to ICT standards development as they provide technical experts with insights into in this emerging technology to address gaps, priorities, and challenges.

The opportunity for strategic EU and international standards development is to learn and spot the gaps on how new technologies are being applied in different ways across countries and business sectors.

For example, in ISO/TR 3242 Blockchain and DLT Use Cases:

- Use cases the fill the gaps from market-led priorities in DLT applications (e.g., sustainable fintech and energy in Italy, Ireland, China, and India)
- Challenges from evolving technical solutions (e.g., new blockchain systems, consortia and dataflows that provide specialty priorities such as privacy/data management. One use case addressing GDPR/EiDAs challenges is by the European Commission Joint Research Centre https://ec.europa.eu/jrc/en
- Insights from transferable technical applications across market sectors (e.g., compare supply chains in provenance food, waste and pharmaceuticals in Spain, Ireland, Netherlands, Singapore, Israel, and India etc).

The current use cases have a significant European perspective in international applications of DLT/Blockchain.

Concerned ICT Standards and contribution to the related landscape

This fellowship contributes to the ICT Standards landscape by creating Use Cases and related Technical Reports in the area of Blockchain and distributed ledger technologies.

I am Convenor of WG6 development of three Technical Reports in ISO TC/307, these are:

- ISO/TR 3242 – Blockchain and distributed ledger technologies – Use Cases Summary https://www.iso.org/standard/79543.html - This TR is due to be published on 31 October 2022.
- This TR features 22 use cases on DLT/Blockchain, including 9 European studies, plus China, India, Israel, Republic of Korea and Singapore.

- ISO/ CD/ TR 6039 - Blockchain and distributed ledger technologies -Identifiers of subjects and objects for the design of blockchain systems.
- ISO/WD TR6277 - Blockchain and distributed ledger technologies –Data flow model for blockchain and DLT use cases.

As the Convenor of ISO/TC307 Working Group 6, and co-editor of ISO/TR3242, I have led the WG6 work programme from formation of the Working Group in May 2019 to progressing Technical Reports through the next ISO publication stages. The use cases reflect:

- Several StandICT.eu Open Call topics, notably listed as "Food, Bio-economy, Natural Resources, Agriculture and Environment".
- EU and international applications of DLT/Blockchain across environmental issues of food provenance, smart energy, and sustainable supply chains.
- all Use Cases identify against specific UN SDGS which reflect the sustainable focus.

Impact (on European SMEs, related project or in the society)

Impact on SMEs

As Convenor of ISO TC307/WG6, I have impacted European SMEs in 2 ways:

1) Enable European SMEs to demonstrate their DLT technology to the ISO community and their stakeholders, potential business partners and future markets. SMEs worked with ISO technical experts in ISO/TC307 WG6, to create an ISO formatted use case methodology of their pioneering business and technology.

2) European SME members gained experience in Standards Development in the DLT technical sector, and can contribute to future standards as experts, reviewers, or authors.

Examples of European SMEs in TRs include:

- ISO/TR3242 – European data provenance, Spain energy markets, Irish energy markets, Irish agricultural provenance, Italian finance, Netherlands finance, Cyprus EU privacy platform and Netherlands/Belgian waste management.
- ISO/CD/TR6039 Identifiers – Irish contribution on agriculture.
- ISO/WD/ TR6277 DLT Data Flows – SME case studies from UK, Ireland, Spain, Portugal.

Impact on Society

Support for societal impacts include alignment with the UN Sustainable Development Goals (SDG) where all use 22 cases in ISO TR3242 are classified against the impact of relevant UN SDGs.

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

Yes, ISO/TR3242 is published, and this has led to 2 new proposals for more use case reports in related and next-gen subject areas. TR6039 is in CD stage and is currently being monitored in a new work proposal for a Technical Specification in this area. If these proposals are agreed during the November Plenary of my WG, then there would be specific consideration for setting up a new standard, or joint initiatives with other TCs.

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

Yes, I have drafted technical reports on use cases.

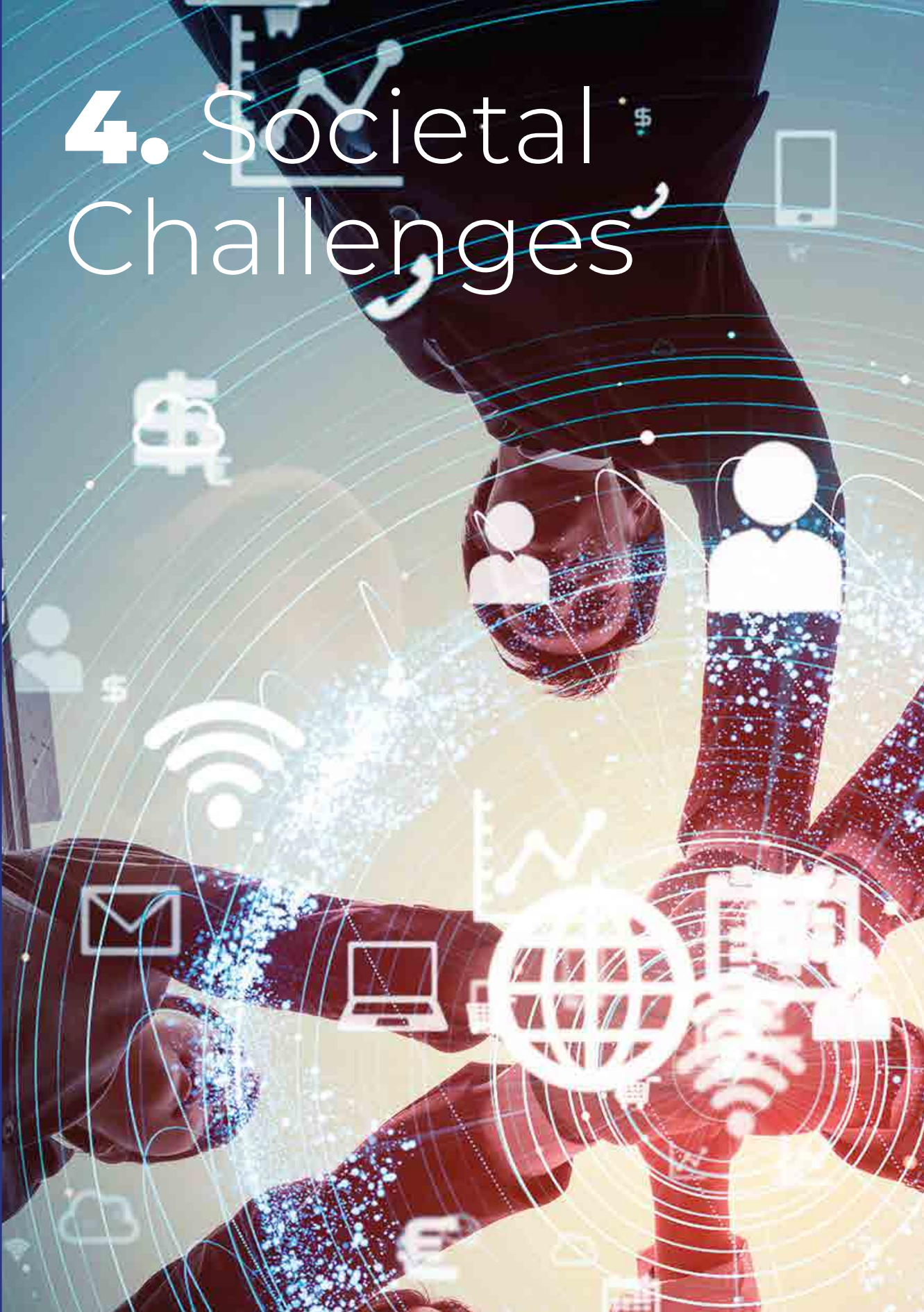
What future efforts or activity are still necessary in your area of application?

The action is continued as the NWIP is being discussed within my WG.

Online references related to the fellowship work

- www.standict.eu/news/trusted-information-digital-space
- www.iso.org/committee/6266604.html
- www.iso.org/standard/81978.html
- www.iso.org/standard/82158.html?browse=t

4. Societal Challenges



ICT-PPDE-moran Phasel: A standard for Justice-ICT Professional Productivity in the Digital Era

Luis Moran Abad
Independent ICT Senior Advisor
Spain

Sector

Justice

Engaged SDOs, WGs and TCs

ISO/IEC JTC 1/SC 40 - IT service management and IT governance
UNE CTN 71 – Enabling technology for digital transformation
UNE CTN 71/SC 40 – Subcommittee for ICT Governance and Management

Role

Convenor

Addressed EU standardisation priorities and gaps

The focus of the fellowship has been to conduct a state-of-the-art study on productivity and its applicability to the Justice Sector, but the results can be extended to other sectors where ICT areas play an important role, such as: eGovernment, eHealth, Startups (Finthech and Regtech) and any traditional ICT department.

This study opens a new horizon for European and international standardisation, as it incorporates the Human Factor into Standards-based Management Systems (MSS). In all the applications of management systems in ICT areas, the same problem was always encountered, the over-saturation of professionals, excessive number of meetings, too much time spent on email. A lot of work, badly organised and not focused on the real objectives of the organisation.

Starting from the analysed problems of the Justice Sector and its different types of organisations, the study has also collected, analysed and structured the state-of-the-art and existing knowledge on productivity, which is essential to help ICT organisations to be more effective and to reduce the stress of their professionals. The analysis of best practices and existing knowledge has been structured on three levels: productivity at department or ICT area level, productivity at team level and productivity at individual practitioner level.

Although there are famous books and publications on productivity on the market, the absence of major management frameworks has been detected, which reinforces the interest for European standardisation to promote this new field that will help professionals to be more satisfied with their work performance.

Concerned ICT Standards and contribution to the related landscape

In the field of productivity and stress reduction for professionals, there is no standardisation line and even less focused on ICT areas. Therefore, this study opens a new horizon of European Standardisation for ICT environments.

However, it must be considered that there is a context of standards for the management of organisations and ICT, and others focused on the management of Human Resources, with

which future ICT productivity standards must interrelate and take into consideration, such as:

- IUMSS: Handbook for User Integration of Management Systems Standard. 2018
- ISO 30401:2018. Knowledge management systems. Requirements.
- ISO/AWI TS 30429 Human resource management. Workforce productivity metrics.
- ISO 30408:2016. HRM. Guidelines on human governance.
- ISO/IEC 38500:2015. Governance of IT for the organization.
- ISO/IEC 20000-1:2018. Service management system requirements.
- ISO 21500:2021. Project, programme, and portfolio management.

Impact (on European SMEs, related project or in the society)

Impact on SMEs

The competitiveness of companies and SMEs is directly related to their capacity for innovation, digitisation, and digital transformation. But we are facing ICT areas that are not able to keep up with the rhythm that the business areas need. Because ICT professionals are saturated, poorly focused, and badly organised.

The study on the state-of-the-art in ICT productivity opens a new scenario for improvement in SMEs, putting the productivity, organisation, and motivation of professionals at the centre of the management of ICT areas. The study is an endorsement of European standardisation towards people, elevating the "self-help" books and the timid initiatives of some professionals to improve their habits to the level of discipline and standard.

Impact on Society

For society, having companies in which their ICT areas with a greater capacity for execution is in itself a great value due to their potential to generate wealth and employment.

But the study focused on ICT departments can be used and extended to all types of organisations and even as a contribution to society's culture. The knowledge and best practices for the improvement of ICT professional productivity can be applied by any profession and by any person in his or her organisation in his or her private life.

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

Maybe, if the study opens a new line of standardisation related to productivity, efficiency, and stress reduction in ICT areas.

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

The initiative generates a state-of-the-art study that will become the first standard in this future line of standardisation. Specifically, the study is the basis for the creation of a Technical Report (TR) standard.

What future efforts or activity are still necessary in your area of application?

Once the study is completed, the local standardisation authorities should be contacted to have the results published as a report standard (TR), thus opening a new line of standardisation related to people's productivity.

Online references related to the fellowship work

www.iso.org/committee/5013818.html

Methodology for FHIR mapping with ISO 13606 and ISO 13940 use cases-based, in ISO/AWI TR 24305

Carlos Luis Parra-Calderón
Head of Research and Innovation in Biomedical Informatics, Virgen del Rocío University Hospital
Spain

Sector

eHealth

Engaged SDOs, WGs and TCs

ISO TC 215 Health Informatics / WG1 Architecture, Frameworks and Models
HL7

Role

Member

Addressed EU standardisation priorities and gaps

Clinical information standards (primarily HL7 and ISO) have focused on representing and disseminating information generated during and for patient care. However, they have not explicitly addressed representation, interoperability, and biomedical knowledge for healthcare and healthcare research applications for integrated use. In the pandemic arena, significant collaborative efforts are underway between HL7 and OHDSI to provide an answer to observational research, accelerating the development of an OMOP implementation guide in FHIR.

My fellowship reviews the landscape developed from a medical knowledge domains approach to propose ISO 13606-3 compliant Clinical Information Structures (CRIS) that can be implemented in ISO 13606-1 archetypes and FHIR-HL7 use case-based schemas in disease-specific use cases. This activity will accelerate the work being developed in ISO 215 to create ISO/AWI TR 24305 "Health informatics - Guidelines for implementation of HL7/FHIR based on ISO 13940 and ISO 13606". It will be significant to analyse the status of each WP of this ISO AWI, both the progress in mappings to ISO 13940 concepts and the elements that require a more substantial challenge on which to propose mapping rules that can provide an answer and reduce ambiguity and thus improve accuracy in mappings to ISO 13606-3 reference archetypes. The mapping rule methodology provided to address the mapping challenges being answered in ISO/AWI TR 24305 will be a methodological building block of significant impact for developing the European Health Data Space.

Concerned ICT Standards and contribution to the related landscape

My project aims to analyse and make explicit the mechanisms by which reference archetypes and Clinical Reference Information Structures (CRIS) based on ISO 13940 (Contsys) are generated, all in accordance with ISO 13606-3, for comparison with FHIR-HL7 resources and attributes.

ISO 13606-3 is the least known part of ISO 13606. In fact, the effort developed has included the understanding of the different parts of the standard, from reference archetypes to Contsys-based CRIS, including clusters and composite structures.

The implemented process serves for the discovery of meaning correlations between reference archetypes and clinical reference information structures with FHIR resources and attributes, in the scope of work of the work package, two of the approved ISO 24305 work items. The approach of the work is based on the semantic interpretation of the concepts handled according to specific disease care use cases.

Impact (on European SMEs, related project or in the society)

Impact on SMEs

SMEs with expertise in HL7 FHIR implementation and interoperability with ISO13606 extracts collaborate in this project. The experts from these companies are making a significant contribution to the development of AWI ISO 24305. This contribution is of great value to the project. Still, at the same time, it means that these companies are getting feedback from the contributions of the other experts and from the deep knowledge of the development of the technical report, which will result in the development of their products and services for the development of their business in real interoperability projects with great European and international scope, both in the exchange of information between hospitals and other healthcare providers, as well as on a larger national scale or exchange between countries.

Impact on Society

This activity is contributing to the availability of aligned standards to accelerate the implementation of infrastructures that enable the StandardiSation of healthcare data in preparation for the European Health Data Space, both for cross-border data exchange and for the repository of standardized data that are available for analysis for collaborative research or healthcare management at the European level.

Likewise, the participation of experts in the work of ISO AWI TR 24305 will also generate a transfer of knowledge and understanding of the different standards that facilitates their understanding among the different SDO working communities involved.

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

Yes, my fellowship supports to identify improvements for subsequent revisions of the standards involved (FHIR r4, ISO 13606:2019 and its three parts, and ISO 13940:2015). It will also be possible to obtain a series of recommendations to make explicit the governance mechanism in the development of archetypes to be recognised as such by ISO.

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

Yes, I have contributed to technical reports on common terminology and on reference material.

What future efforts or activity are still necessary in your area of application?

It is necessary to complete the work of ISO AWI TR 24305, as it will be the basis for further development as a TR that will provide standardised mappings between standards that will facilitate effective semantic interoperability.

This fellowship proposes a set of mappings at the highest possible level between standards and designs the mechanisms to cover the development of ISO13606 archetypes so that these new archetypes maintain semantic alignment with FHIR. Also, my work will provide recommendations for developing the roadmap of the standards involved (FHIR R4, ISO 13606:2019, and ISO 13940:2015).

Online references related to the fellowship work

www.iso.org/committee/54960.html

W3C Accessibility Education and Outreach

Victoria Menezes Miller

W3C Web Accessibility Initiative, Education and Outreach Working Group – Invited Expert Conceptivity Sarl

Switzerland

Sector

Accessibility of ICT

Engaged SDOs, WGs and TCs

W3C WAI Educational and Outreach Working Group (EOWG), WCAG 2.1, WCAG 2.0

Role

Member

Addressed EU standardisation priorities and gaps

My fellowship focuses on two priorities. Firstly, information must be available to all. Since Covid, the reliance on digital media and services increased substantially and the need to make information accessible is more critical than ever before. Secondly, there is a need to remove the barriers to accessibility which are frequently caused by lack of understanding and knowledge about the topic.

Also, this activity targets several challenges encountered:

- Challenge 1: Accessibility is "expensive", especially for SMEs.
- Challenge 2: Accessibility is "hard to implement".
- Challenge 3: Accessibility is not a priority.
- Challenge 4: Accessibility is "not for me" – says the designer, developer and/or author.

The EO WG develops a wide range of educational resources to support WCAG (2.0 and above) to overcome the above challenges in the following ways:

- Creation of resources which are targeted for different audiences (authors, developers, designers, managers).
- Making available educational resources which are provided free of charge so that a wide audience is reached, especially SMEs.
- Developing resources with usability in mind to encourage easy adoption of accessibility standards in a user-friendly manner.
- Working on observing technological trends which might cause barriers to accessibility and, therefore, seek to ensure adaptation in future revisions of accessibility standards.

Concerned ICT Standards and contribution to the related landscape

My fellowship contributes to the ICT Standards landscape with respect to accessibility of information and services, specifically WCAG 2.0, 2.1 (Web Content Accessibility Guidelines). The educational resources developed by EOWG are a valuable support in making the standard easier to understand and comply with it should be noted that these resources are free of charge and therefore benefit not only individuals, but a large community of SMEs, that may not have resources to cover accessibility studies of their websites or systems. These resources point in a user-friendly manner to how accessibility can be implemented without in-depth expertise and without spending a significant number of resources. With respect to

this grant, I was first intending to work on translations of current resources related to WCAG but due to the requirements of the Chairs of the Working Group, and the rescheduling of work, my contribution has been to a large number of surveys intended to collect feedback on specific resources and current topics.

Impact (on European SMEs, related project or in the society)

Impact on SMEs

SMEs assume that accessibility is expensive and engaging consultants is the only way forward which can be costly. The resources produced by the EO WG are aimed at ensuring that accessibility can be easily and progressively implemented by all, free of charge.

- These educational resources are developed with a wide range of audiences in mind, e.g., developers, content authors, site designers, managers, procurement officers etc.). The intention is to provide resources which will convince upper management of the necessity to ensure that websites are built with accessibility standards in mind. Thereafter, developers, content authors and designers need resources to guide them, and we provide these resources.
- The effort to introduce educational resources on accessibility standard implementation in other languages is crucial, given that Europe has many cultures and languages and a wider distribution in several languages is beneficial.

Impact on Society

Implementing accessibility ensures that information is available to all. As the UN Convention, Article 9(g) states: "States Parties shall also take appropriate measures: To promote access for persons with disabilities to new information and communications technologies and systems, including the Internet".

Simply put, it is a fundamental right that everyone should have equal access information to participate in society and the economy. The European Web Accessibility Directive has set deadlines for implementing accessibility. The Web Accessibility Directive requires Member States to report on the results of their monitoring activities every three years. The next set of reports is due in 2024. It is, therefore, recognized on a European level that accessibility is an essential requirement.

Moreover, accessibility needs to be implemented more widely so that information is readily available to all without any online barriers which are sometimes created simply due to lack of knowledge, guidance and awareness. Thus, with this fellowship, the benefits were:

- Support for my contribution as Invited Expert in the Accessibility and Education and Outreach Working group.
- Contribution to improvement of several resources through many surveys issued in the last 6 months.

What future efforts or activity are still necessary in your area of application?

There are an insufficient of experts in this area. As an example, I am an "Invited Expert" for W3C and there are only six such invited experts worldwide. My contribution is important from a European perspective in this Working Group. I know, from experience, there is a dire need for more experts.

Online references related to the fellowship work

www.w3.org/WAI/about/groups/eowg

Explainability Toolkit

Ben Bland
Independent Expert
United Kingdom

Sector

Accessibility of ICT

IEEE

Engaged SDOs, WGs and TCs
IEEE Social Implications of Technology Standards Committee (SSIT) Steering Committee

Role

Chair of IEEE P7014

Addressed EU standardisation priorities and gaps

Standards developers are challenged by a lack of shared resources (e.g., taxonomies, processes, documentation, etc.) and must develop their work in isolation. This results in redundant work, as well as difficulty in mapping standards to each other. The single, broad, and detailed framework that xplAInr provides should help to solve this issue.

It can be a substantial effort for technology developers to apply appropriate standards to their work. By publishing a resource that maps standards to the xplAInr framework, our hope for this funded project is that systems developers will find it easier to discover and conform to relevant standards.

My fellowship aims to address the following objectives of the European Commission's Standardisation Strategy[4] :

(1) "Anticipate, prioritise and address standardisation needs in strategic areas" – The mapping of standards to an AI explainability and system lifecycle framework, should highlight which areas of standardisation are stronger and weaker with respect to each stage of AI system development.

(2) "Improve the governance and integrity of the European standardisation system" – The xplAInr framework provides a toolkit for assessing governance and integrity of AI systems. By mapping this framework to standardisation efforts, we hope to enable the work of standards developers to become dramatically more effective and relevant for real-world products and systems.

(3) "Enhance European leadership in global standards", (

4) "Support innovation", and

(5) "Enable the next generation of standardisation experts" – This funded project applies a novel standards library to a new framework for AI explainability. By combining these two fields, we present a jointly innovative resource for Europe to set a leading example to global, regional and sectoral standards and systems development efforts.

Concerned ICT Standards and contribution to the related landscape

The aim of the Explainability Framework is to provide a single resource for developers of automated and intelligent systems to document their work – particularly with respect to ethical parameters – and for all other stakeholders (e.g. policy and auditing parties, as well

4 https://ec.europa.eu/docsroom/documents/48598

as system users and the general public) to explore the technical and ethical parameters of the system in development. This fellowship allows to map the xplAInr framework to existing and forthcoming standards, and to investigate the content of standards for improving AI explainability. By publishing the results of this exercise to the xplAInr toolkit, systems developers will be able to assess which standards relate to every stage of their work, from design to deployment to decommission. Likewise, standards developers will have unprecedented access to documented evidence of systems developers' real-world processes, decisions, and issues.

Now, at the end of this project, we have created an index of standards (both published and in development) mapped to the AI development lifecycle stages of the xplAInr framework. This index is now being published to the xplAInr website to make it publicly available. This index is selected from the primary international standards development organisations – IEEE and ISO – and those in Europe: CEN, CENELEC and ETSI. In this exercise we have so far mapped 87 relevant standards to the xplAInr framework but this number is likely to change as we research these standards more extensively.

Impact (on European SMEs, related project or in the society)

Impact on SMEs

The xplAInr framework is primarily designed for developers of AI systems globally, which includes European SMEs working on AI systems. This fellowship helps those SMEs explore related standards, to assist in their work.

Impact on Society

It is too early to measure societal impacts. But by publicly publishing the work of this project, we make it immediately available to a wide range of stakeholders – not just standards developers but also systems developers, policymakers, auditing and certification bodies, and the public. We have heard from many sources that there is a frustration at the lack of visibility of, or integration between, standards. We therefore hope to provide a vital standardisation resource for which we have heard there is a great need.

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

xplAInr was developed on work originally done by the IEEE P7014 standards working group in relation to designing an Ethical Explainability Toolkit. Furthermore, we have discussed the concept with various WGs, TCs, etc. to support their work.

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

Yes, the project deliverables are primarily information published publicly through the xplainr.ai website – as a Standards Index and as blog posts providing further information and guidance. We have also presented to standards development groups, which informs them but may not produce any specific deliverables.

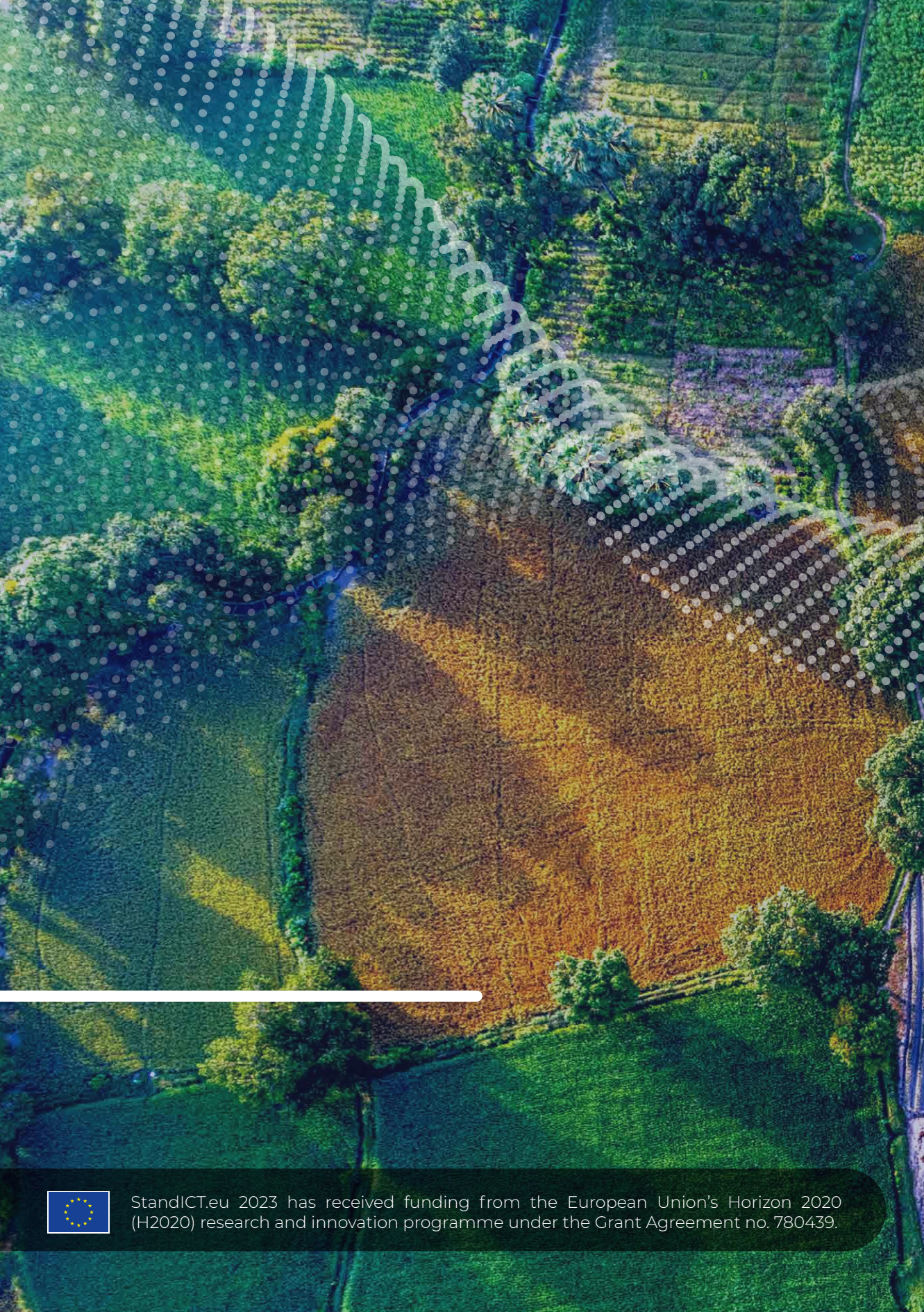
What future efforts or activity are still necessary in your area of application?

As a general point that applies to multiple standards development efforts at this time, I propose that further support is given to the creation of shared resources that help to integrate different standards. These can include taxonomies, case studies, foundational rulesets, toolkits and so on. xplAInr is built in this spirit but far more is needed. Those parties that are in central, governing or supporting roles, outside specific standards development groups, could help to develop these supporting resources.

Online references related to the fellowship work

www.xplainr.ai

https://beyondstandards.ieee.org/5-issues-at-the-heart-of-empathic-ai



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