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

THIRD OPEN CALL

Editors:
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Acknowledgements

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Foreword

We are incredibly enthusiast to see the continuation of our *"Following the Fellows"* series with the issue of the third dedicated booklet, bearing a tangible testimony of the **impact** generated by European ICT experts working within international Standardisation Developing Organisations, thanks to the financial support provided through the **StandICT. eu 2023 Fellowship Programme** Open Calls, as part of the broader mission of the StandICT. eu 2023 Coordination and Support Action, funded by the European Commission's H2020 Framework Programme.

The goal of these regular publications is to place the work carried out by our fellows at the centre stage and to illustrate the demonstrable outcomes that excellent research can make to both society and to the economy. 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. This edition comes timely after the release of the **EU Strategy on Standardisation**[1], an instrumental document to point out the importance of standardisation in promoting the uptake of results from EU research and innovation projects, allowing new technologies to scale–up and enter into the market.

The entire rationale behind the **StandICT.eu 2023 Fellowship Programme** attempts to respond to the declared goal of bringing *«the European angle of standardisation at international level, rather than create EU-specific standards that looks to turn Europe into a standard-setter, rather than a standard-taker»*. In this regard, the work undertaken by our Fellows will concretely contribute to strengthening the link between R&I and the standardisation ecosystem as well as to pushing towards the path of the twin green and digital transition in support of the resilience of the single market

Finally, we believe that this Report can effectively respond to the recommended approach envisaged under Horizon Europe to implement a more **evidence-based impact**, presenting the tangible results available from each activity in a tidy fashion, as the result of careful and continuous monitoring of the impact that each successful applicant is making to European priorities and European contributions.

Special thanks in putting together this booklet go to External Advisory Group who, as always, have provided 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 have scrupulously vetted the numerous applications received in response to this call, to our Partners, Dublin City University and AUSTRALO 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 impact.

Silvana Muscella
CEO, Trust-IT Srl
StandICT.eu 2023 Project Coordinator

1   DocsRoom - European Commission (europa.eu)

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■ Introduction

This report provides an immersion to user empowered outcomes of the StandICT.eu 2023 Open Call #3 from the perspective of fellows that were selected and funded in this call. Our team is delighted to showcase the third 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. More importantly, this report follows closely the trail marked by the recently issued European Standardisation Strategy[1], by highlighting the importance of standardisation in facilitating the uptake of results from EU research and innovation projects, allowing new technologies to scale–up and enter into the market.

Standards form a common language that allows researchers, people, public institutions and industry to communicate, produce and commercialise products and services. This is especially important in the European single market. Standardisation plays a vital role in creating a fair market-based competition and help ensure the interoperability of complementary products and services, by reducing costs, improving safety, and enhancing overall competition.

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 competent European ICT experts to contribute to the modernisation and consolidation of the European standardisation system, ensuring it is better oriented towards meeting the EU's main interests, policy priorities, core principles and values, towards a speedy and seamless green, digital and industrial transition, in a timely manner (as outlined in the "*Communication on European Growth Model – Towards a Green, Digital and resilient economy*"[2]).

The primary purpose of this document is to share with you the results attained through the work carried out by the funded expert, 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 as a whole.

This Open Call is the third 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 #3 is presented through key facts and figures, by pointing out specifically the major results obtained with a view to fill European priorities and gaps, to contribute to sectoral ICT areas and to stress the correlated societal and industrial impact.

It is therefore interesting to observe how the document (and fellowship outcomes) is organised in order to mirror the four main technological areas as outlined in the ICT Rolling Plan for Standardisation and the tight connection with StandICT.eu 2023.

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1   COM_2022_31_1_EN_ACT_part1_v5.pdf
2   https://ec.europa.eu/info/business-economy-euro/growth-and-investment/european-growth-model_en

Overview of the Open Call #3

The third StandICT.eu 2023 Open Call was launched on the 18th of March 2021 and closed on the 18th of May 2021. 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[3].

This Open Call identified "**Civil security for society**" as its leading theme with a view to uphold European researchers in the response to the challenges arising from persistent security threats (including cybercrime), as well as natural and man-made disasters. This will result in supporting "*a resilient and more stable Europe that protects*" as well as for this purpose supporting a competitive European civil security industry sector.

As such challenges are growing fast and social and technological developments are making a response increasingly complicated, security research and standardisation activity can serve as a tool to move from a reactive approach to security to a proactive approach based on foresight, prevention and anticipation. **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 first Open Call totalled 76 eligible applications received out of which **35 have been selected for funding**, with an overall 314,000 Euro granted. After the evaluation procedure by external experts, the selected projects rated a significant average quality score (the minimum threshold to access funding was 7,83 score in a 1 to 10 scoring scale).

The funded applications provided an extensive geographical coverage with **15 different EU countries represented** (see Figure 1), with a satisfying balance across the key technologies

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3   https://joinup.ec.europa.eu/collection/rolling-plan-ict-standardisation/rolling-plan-2021

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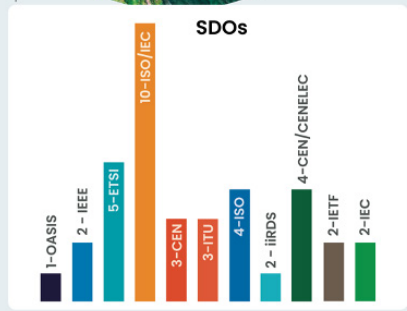
and priority topics of the third call, and with a wide spectrum of SDOs that will benefit of the competence and expertise of the applicants.

As outlined in Figure 1 above, fundamental areas as Cybersecurity (and correlated sub-domains), 5G, Artificial Intelligence and Blockchain proved to be the most tackled by the StandICT.eu 2023 fellows. It is noteworthy to point out how fundings have been allocated for the first time to carry out research in new technological fields, mainly Ontologies and Open Standards, Learning and Education, Emergency Communications and e-Government.

Engaged SDOs, Organisations and European Projects

65% of the fellows' effort will be devoted to work within Global SDOs, while the remainder will contribute to European SDOs. Another insightful observation that can be made on the basis of the statistics is the increasing number of fellows coming from a Research & Academic background (nearly 25%), and the consistent percentage of fellows working within SMEs or Industrial environment: this is another concrete proof of how much the European industrial landscape is now committed to investing resources, workforce and know-how to ensure a full ICT Standards uptake in the market in view of a steady commercial and economic growth.

13 European funded research projects (see Table 1 below) are related to the presented StandICT.eu fellowships, with a strong focus on Cybersecurity, Data Protection and Artificial Intelligence.

Table 1 – European Research Projects related to StandICT.eu 2023 OC#3 Fellowships

Research Project	Programme	Domain	Contributing StandICT.eu OC#3 Fellow
Interconnect	H2020	Smart homes, building and grids	Amélie Gyrard
AI4EU – (via Open call participation)	H2020	Artificial intelligence	Amélie Gyrard
ACCRA	H2020	Robotics	Amélie Gyrard
GeoE3	INEA	Public Open Data	Ikka Rinne
CONCORDIA	H2020	Cybersecurity	Vasileos Mavroeidis
JCOP	CEF Programme	Cybersecurity	Vasileos Mavroeidis
SAPPAN	H2020	Cybersecurity	Vasileos Mavroeidis
CyberSec4Europe	H2020	Cybersecurity	Stephan Krann
KRAKEN	H2020	Data protection	Stephan Krann
PRISMACLOUD	H2020	Privacy and Security	Stephan Krann
CREDENTIAL	H2020	Data protection	Stephan Krann
i3market	H2020	Industrial Leadership	Antonio J. Jara
Ideal Cities	Marie Skłodowska-Curie RISE	Smart Cities	Marios Angelopoulos

Research Project	Programme	Domain	Contributing StandICT.eu OC#3 Fellow
NGI Trust	H2020 – NGI Next Generation Internet	Privacy and trust enhancing tech	Fabien Imbault
OntoCommons.eu	H2020	Ontologies	Mark Schubert Ulrike Parson

Now, we are delighted to share with you the very first 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 framework of the Open Calls and the fellowships but also on the European Observatory for ICT Standards (EUOS www.standict.eu/euos) - via the technical work groups delivering up-to-date landscape and gap analysis and policy recommendations to help shaping together and reinforcing European contribution to the international ICT standardisation scheme.

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1.
Key Enablers and Security

Privacy by Design for Consumer Goods and Services - Development of ISO 31700

Jacqueline Zoest
Working group member of ISO PC317 WG1 and Chairperson / convenor of UK 'mirror' panel IOT 1/5 (IOT - Privacy by Design). United Kingdom

Sector

E-Privacy

Engaged SDOs, WGs and TCs

ISO
IEC
ISO PC 317 WG1

Addressed EU standardisation priorities and gaps

Priorities addressed are Privacy Protection and Building Trust (particularly in the context of the Internet of Things). The new standard (ISO 31700) aims to provide high-level requirements and key principles for design processes that protect privacy throughout the lifecycles of consumer goods and services.

This standard addresses a gap identified in existing European and International Standards, i.e., while existing standards refer to 'privacy by design' and /or attempt to define it, there is not yet a process standard for 'privacy by design'.

The need for this standard was identified by consumer organisations and reflects consumer concerns surrounding privacy /security of IoT. The standard aims to ensure that the IoT of the present and the IoT of the future is an IoT where consumer privacy is protected, thus enhancing consumer confidence, and increasing uptake in the use of the Internet of Things and technology generally.

Concerned ICT Standards and contribution to the related landscape

This project contributes to the ICT Standards landscape by ensuring my continued contribution to the development of new international standard ISO 31700 through the Committee Draft stages. ISO 31700 will guide ICT and IoT developers in incorporating 'privacy by design' into the development process.

I contribute to the ISO PC 317 WG1: this group continues to develop the draft international standard for IoT privacy by design. As Convenor of the UK/BSI IoT privacy by design mirror panel and as an expert member of the WG, I voice the UK and European industry and consumer view and to contribute my individual expertise as a technology expert in the technology law. In this WG, USA and Canada are very well represented, and increasingly influential. It is therefore important that the contribution of European independent experts and SMEs continues, to ensure that the European perspective on Privacy (GDPR) and Cyber Security continue to influence this standard.

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

Impact on SMEs

One of the goals of PC 317 was to produce a standard that could be used by SMEs, i.e. a standard that is short (and therefore affordable); and a standard that easy to implement, i.e.

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accessible to and adaptable by SME's. Also, it must be sufficiently comprehensive to meet the needs of organisations of all sizes. As an independent expert, I voice the views and needs of SMEs in an environment where there is a strong voice from large organisations.

Impact on society

The work aims to enhance consumer trust in IoT and ICT generally, by ensuring that the IoT of the present and the IoT of the future is an IoT where consumer privacy is protected, thus enhancing consumer confidence, and increasing uptake in the use of the Internet of Things and technology generally. (The need for the new standard was identified by consumer organisations and reflects consumer concerns surrounding privacy /security of IoT.)

Has your project directly involved or led to a specific recommendation or proposal for the development of new or revised standards? Or was it aimed at supporting the development or revision of a standard already under development?

Yes, the participation in PC317 WG1 in order to support continued development of new standard ISO 31700 (commenced 2018/19)

Has your fellowship contributed to the development of a new work group (WG) or a new technical committee (TC)?

NO

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

YES – Technical report (Development of new standards)

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

The standards are in preliminary phase; therefore, further actions are suggested. Project was participation in PC317 WG1 to support continued development of new standard ISO 31700 (commenced 2018/19).

Online references related to the fellowship work

N/A

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Increasing Applicability of Privacy-Enhancing Technologies through Standardization

Stephan Krenn
Senior Scientist
AIT Austrian Institute of Technology.
AustriaSector
E-Privacy

Engaged SDOs, WGs and TCs

ISO/IEC
OTHER
ISO/IEC JTC1/SC27 WG2

Addressed EU standardisation priorities and gaps

Privacy-enhancing technologies (PETs) are up high importance in an increasingly interconnected world, in order to ensure the privacy of users and safeguard their fundamental rights. Furthermore, given strong privacy laws in Europe and other countries around the globe, the standardisation of PETs is important to provide companies with ready-to-use technology that eases compliance with these regulations. However, up to date many advanced primitives only exist in the academic literature and are not easily accessible to software developers. The main ambition of this project is to overcome this problem, by contributing to the standardisation of advanced mechanisms such as redactable signature schemes, group signature schemes, or anonymous authentication schemes. By standardising zero-knowledge proofs of knowledge within the ZKProof community standards initiative will help making also this technology ease-to-use by developers and non-experts.Concerned ICT Standards and contribution to the related landscape

The activities covered by my application are related to the standardisation of advanced privacy-preserving cryptographic mechanisms, which are an ongoing task within ISO/IEC JTC1/SC27 WG2, where numerous schemes are currently under development. Many of these advanced technologies have not yet been standardised by any major standardisation organisation but having them standardised is of utmost importance to increase their real-world uptake and impact.

Specifically, during the first half of this project, I have contributed to:

▷ ISO/IEC 23264-2 Information security — Redaction of authentic data — Part 2: Redactable signature schemes based on asymmetric mechanisms

▷ ISO/IEC 20009-3 Information technology — Security techniques — Anonymous entity authentication — Part 3: Mechanisms based on blind signatures concepts

▷ ISO/IEC 20008-2/AMD2 Information technology — Security techniques — Anonymous digital signatures — Part 2: Mechanisms using a group public key

Furthermore, we are still in the progress of setting up a working group on Sigma protocols within the ZKProof community standards initiative.

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Has your project directly involved or led to a specific recommendation or proposal for the development of new or revised standards? Or was it aimed at supporting the development or revision of a standard already under development?

NO - I am mainly working on ISO/IEC 20009-3, ISO/IEC 20008-2/AMD2, and ISO/IEC 23264-2. These standards have already been started quite some time ago as part of various H2020 projects (CREDENTIAL, PRISMACLOUD, CyberSec4Europe), and the StandICT.eu project allows me to further increase my contributions there. To a minor part, I am also co-editing a new standard on Sigma-protocols as part of the ZKProof community standards initiative, which we started just before my project was accepted.

Has your fellowship contributed to the development of a new work group (WG) or a new technical committee (TC)?

ONGOING - we are currently trying to set up a dedicated working group for Sigma-protocols within the ZKProof initiative.

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

YES - I have contributed comments to, and co-edited, the most recent iterations in the development process of ISO/IEC 20009-3, ISO/IEC 20008-2/AMD2, and ISO/IEC 23264-2, (still in a Committee Stage, where the documents are not yet publicly available)

Grant negotiation and authorization protocol (GNAP)

Fabien Imbault
CEO, FIMACORP. France

Sector

Electronic identification and trust services

Engaged SDOs, WGs and TCs

IETF

Addressed EU standardisation priorities and gaps

Our contribution is related to an IETF standard called GNAP (grant and negotiation authorisation protocol). This working group is chartered to develop a fine-grained delegation protocol for authorization, API access, user identifiers, and identity assertions. The protocol will also allow the client to present unverified identifiers and verifiable assertions to the Authorization Server (AS) as part of its request. This protocol enables an authoriSing party to delegate access to client software to use a Resource Server (RS) with this token. It will expand upon the uses cases currently supported by OAuth 2.0 and OpenID Connect (itself an extension of OAuth 2.0) to support authorisations scoped as narrowly as a single transaction, provide a clear framework for interaction among all parties involved in the protocol flow, and remove unnecessary dependence on a browser or user-agent for coordinating interactions.

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

Impact on SMEs

Ability to secure software services, support for SaaS start-ups (alternative signing mechanism compared to Google or Facebook, including privacy and security considerations).

Impact on society

This works aims to support better authorisation services, aligned with EU goals (especially, GDPR, eIDAS and regulation related to digital gatekeepers). GNAP is designed to be interoperable with decentralised identity standards and to provide a human-centric authorisation layer. In addition to the core protocol, GNAP supports various patterns of communication between RSs and ASs through extensions. GNAP tries to limit the odds of a consolidation to just a handful of super-popular AS services.

Has your project directly involved or led to a specific recommendation or proposal for the development of new or revised standards? Or was it aimed at supporting the development or revision of a standard already under development?

YES - Development of IETF GNAP (Grant Negotiation and Authorization Protocol)

Has your fellowship contributed to the development of a new work group (WG) or a new technical committee (TC)?

YES - IETF GNAP is now a new working group

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Have the standardisation activities in your project led to specific deliverables?
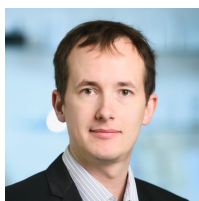
YES – Technical report (development of new standard); Technical report (Common Terminology)What future efforts or activity are still necessary in your area of application?

The standards in this field are in preliminary phase. Therefore, further actions are suggested. We now plan a hackathon for iETF113 https://trac.ietf.org/trac/ietf/meeting/wiki/113hackathon in March 2022, and generally need to work on opensource and interoperable implementations, and prototype a formal security analysis tool.

Online references related to the fellowship work

https://github.com/ietf-wg-gnap/gnap-core-protocol

https://github.com/ietf-wg-gnap/gnap-resource-servers

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Biometric Web Services for Biometric Recognition, using REST technology

Raul Sanchez – Reillo

Contributor and Standard Editor, Full Professor and Head of the University Group for Identification Technologies, University Carlos III of Madrid.
Spain

Sector

Electronic Identification and trust services

Engaged SDOs, WGs and TCs

ISO/IEC
CEN/CENELEC
OASIS
ISO/IEC JTC1/SC37 WG2

Addressed EU standardisation priorities and gaps

The targeted standard (expected to be published as ISO/IEC 30108-2) will allow service providers to integrate local and remote biometric authentication. This will be applicable not only to the private sector, but also to the Public Administration.

These actors will benefit from a solution that will ease the adoption of GDPR when transmitting biometric information over the network, reducing vulnerabilities, and improving privacy.

Current solutions are mostly based on passwords, although some service providers implement authentication based on e-signatures. Unfortunately, due to the complexity of this kind of systems, or the huge number of passwords they must handle every day, most users try to ease their life by, for example, choosing weak passwords, or just copying them into a vulnerable computer. This kind of practices put the citizen's privacy at risk.

The proposed activity tries to provide a solution that will close this gap between security and usability.

Concerned ICT Standards and contribution to the related landscape

Biometrics is extensively standardised, either at ISO/IEC or at CEN. Unfortunately, there are some gaps in the standardisation field that do not cover industrial demands. One of them is the need to provide a standard that will allow an interoperable way of authenticating IT users over the network using biometrics. There have been some initial works in this field, such as the initial definition of BIAS (Biometric Identity Assurance Services), standardized as ISO/IEC 30108-1:2015.

This standard is a specification written in XML and does not adjust to a common implementation in REST-based web services. Currently, developers should read this standard and take their own approximations, which may not be equivalent among developers.

In addition, some of the services initially defined in BIAS should be revisited and to provide an implementation that will ease the adoption of GDPR.

Therefore, the objective is to develop a new part of ISO/IEC 30108 standard within ISO/IEC JTC1/SC37 WG2.

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

Impact on SMEs

The proposed activity provides a solution in the field of electronic identification, as is based on the identification of users through biometric means. In addition, the web services to be defined will allow to develop trusted services. This will ease the development of new (or improved) services over the Internet, activity that is handled mainly by SMEs in Europe. Therefore, this standard will boost SME activity.

Impact on society

As the standard is now moving towards a successful finalisation, and using a well-known interface specification model, society may benefit in few years of a variety of RESTful services that solve the identification of people, either based on biographical data, document data or biometric data.

Has your project directly involved or led to a specific recommendation or proposal for the development of new or revised standards? Or was it aimed at supporting the development or revision of a standard already under development?

YES - Although the revision of ISO/IEC 30108-1 was not in the scope of the development of ISO/IEC 30108-2, the work done has shown some inconsistencies in part 1, that will have to be addressed as soon as the work for part 2 is finished. Therefore, it is expected to start the revision of part 1 within 2022.

Has your fellowship contributed to the development of a new work group (WG) or a new technical committee (TC)?

NO

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

YES – Technical report (Development of new standard); Technical report (Recommendations for new/revised standard).

The work done is intended to produce an IS, in fact, ISO/IEC 30108-2. The project is at WD stage, where it has been for very long time with no progress, and thanks to this work, has been enormously improved, progressing to CD in January 2022, and most likely, to DIS in September 2022.

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

The standard has advanced from preliminary to development state, with the intention to reach maturity in a couple of years. Therefore, continuation of action is suggested. As result of this fellowship, now the standard is close to its finalisation. But before publication, the work has to be continued to solve some organisational problems (i.e., relationship with other standards, such as ISO/IEC 19785-3), and creating a set of application examples that will serve to both, debug the solution and ease the adoption of the standard by the development community.

Online references related to the fellowship work

N/A

Cybersecurity Standardisation Working Group 1 (SME Chair) ECSO (cooperation with CEN/CENELEC / ETSI)

Mark Miller
CEO of CONCEPTIVITY
Switzerland

Sector

Cybersecurity / network and information security

Engaged SDOs, WGs and TCs

CEN
ETSI
ECSO/ETSI

Addressed EU standardisation priorities and gaps

The largest gap is in addressing cybersecurity standards that are NOT SME or start-up friendly. The priority is clearly the SME communities and the start-ups that want to compete with solutions, but do not have the revenue, nor the resources to undergo a "full" cybersecurity certification process based upon the current standards. The ENISA Framework of Standards presents an opportunity to address this, with the specific SME focus. And in addition, the cooperation agreements between ECSO and ETSI and ECSO and CEN facilitate this work.

Concerned ICT Standards and contribution to the related landscape

The focus of my funded application is to look at the Framework of cybersecurity standards (ENISA) and the existing fragmentation in Europe with a view toward finding more SME and start-up friendly approaches to addressing standardisation. One of the key benchmark standards is the Common Criteria (ISO 15408) which is clearly NOT an SME and start-up friendly standard given the requirements for preparation and certification under this. However, the goal is to look for opportunities to address the standardisation with a view to keep the cost and resource requirements lower.

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

As the Chair representing SMEs, the funding work efforts are specifically geared for the SME community.

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

YES - The first deliverable is a questionnaire for the SME and start-up community and this document has finally been approved by the working group in its final format and will be distributed for completion by the SME target audience

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Cybersecurity and Radio Equipment standardisation and guidelines for HS production

Octavian Popescu
ETSI Member delegate, Consultant and company owner, EUCOMREG sprl
Belgium

Sector

Cybersecurity / network and information security

Engaged SDOs, WGs and TCs

ETSI
ETSI TC ERM
TC CYBER
TC RRS

Addressed EU standardisation priorities and gaps

Existing Guidelines don't describe how to produce the standardisation deliverables aimed at covering the newly activated RED essential requirements. This proposal aims at introducing this element in discussion.

Here are some of the existing ETSI Guides proposed for discussion.

▷ EG 203 336.

▷ EG 201 058 Implementation Conformance Statement (ICS) proforma style guide.

▷ EG 201 015 Specification of protocols and services; Validation methodology for standards using SDL; Handbook.

▷ EG 201 383 Use of SDL in ETSI deliverables; Guidelines for facilitating validation and the development of conformance tests.

▷ EG 202 106 Guidelines for the use of formal SDL as a descriptive tool.

▷ EG 202 107 Planning for validation and testing in the standards making process.

However, before creating a work item for these updates, a discussion for the working group that will perform this work is needed.

Concerned ICT Standards and contribution to the related landscape

My project proposes to start the work on ETSI guidelines for the production of Harmonised European Standards for the new essential requirements produced by the RED articles activation. Radio equipment placed on the EU single market must comply with the essential requirements of the Radio Equipment Directive (RED). European Commission (EC) activated Article 3.3 d, e, f essential requirements in a delegated act dated 29.10.2021. Some of the essential requirements activated in the RED articles 3(3) (d/e/f) aim at the protection of personal data and privacy, the protection from fraud and ensuring compliance of reconfigurable radio systems. The standards responding to the Article 3.3 do not yet exist.

An important element that is currently overlooked is the guideline describing the method and the process to produce the standardisation deliverables. This proposal aims at introducing this element in the discussions in ETSI on this topic.

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

Impact on SMEs

The impact of my proposal, if successful, is to contribute to producing Harmonised Standards presenting the SME perspective, thus helping to create an easier path to compliance with possible cybersecurity aspects in the legal requirements related to the RED articles activation.

Standards should be easy to read, and their requirements should be kept to the minimum necessary to meet the legal requirements to place conforming products on the EU single market.

Impact on society

In my work I explained that the Delegated Act is a new legislation creating new legal obligations, and that all the other harmonisation legislation stays the same and its provisions, with their existing guides, create the guardrails for the guide for standardisation of the Art. 3.3 requirements. The new legal obligations affect the stakeholders participating in the EU radio equipment single market.

I proposed that the ETSI Guide to produce Harmonised Standards should: examine such harmonisation legislation and the official guides around them, try to determine the parts that are relevant for the standardisation process, explain these for the benefit of the authors of the standards.

Has your project directly involved or led to a specific recommendation or proposal for the development of new or revised standards? Or was it aimed at supporting the development or revision of a standard already under development?

NO

Has your fellowship contributed to the development of a new work group (WG) or a new technical committee (TC)?

NO

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

NO

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

In view of the pending standardisation request, the need for an examination of the way to produce these new Harmonised European Norms is becoming clear, although a number of ETSI members expressed their reservations regarding this.

Currently there is insufficient support for tackling this issue and there is a need for resources to be allocated for this very challenging topic. Moreover, the expertise needed is multidisciplinary.

Online references related to the fellowship work

ETSI contributions are posted on the ETSI portal which is accessible for ETSI members.

For TC CYBER Meeting 27 https://portal.etsi.org/Contribution.aspx?MeetingId=38818 ,

and for TC RRS Meeting 56 https://portal.etsi.org/Contribution.aspx?MeetingId=38400 .

FOLLOWING THE FELLOWS / **IMPACT REPORT FROM FUNDED APPLICANTS TO THE STANDICT.EU 2023 FELLOWSHIP PROGRAMME / THIRD OPEN CALL**

21

Threat Actor Intelligence for Criminal Justice and Trusted Information Sharing
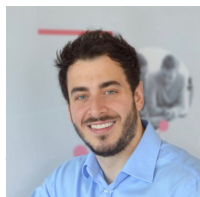
Vasileos Mavroeidis

Cybersecurity Scientist / Chair of Standards Technical Committee, University of Oslo. Norway

Sector

Cybersecurity / network and information security

Engaged SDOs, WGs and TCs

OASIS
Threat Actor Context Technical Committee (TAC TC)

Addressed EU standardisation priorities and gaps

Organisations that share cyber threat intelligence are confronted with multiple representation schemas and a plethora of non-standardised and ambiguous vocabularies. These limit the organisation's ability to correlate and analyse attack data and consequently to better understand the threat landscape, meaning the adversaries' goals, capabilities, and trends in targeting and techniques. To support organising what is known about cyber adversaries, the TAC TC is developing a common knowledge management framework that enables semantic interoperability of threat actor contextual information. The ontology is based on STIX 2.1 standard and provides extensions for broader conceptual coverage so that it can be used in multiple application areas, such as cyber threat intelligence analysis, vulnerability management, incident response, enrichment, risk analysis, decision making and security automation, and knowledge inference.

Concerned ICT Standards and contribution to the related landscape

The grant directly supports the development of the Threat Actor Context Ontology (TAC Ontology) within the OASIS Threat Actor Context Technical committee.

The TAC Ontology is an open-source modular knowledge representation framework that captures the rich context around adversaries. In addition to newly introduced concepts, the TAC ontology integrates and harmonises other standards pertinent to cyber threat intelligence representation to better understand a threat landscape and how defenders position against it.

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

Impact on SMEs

One of the goals of the TAC TC is to help organisations to share, process, analyse, and directly operationalise cyber threat intelligence from multiple sources to improve their cyber security posture against cyber threats. The TAC Ontology is open-source and can be used to support organisations' threat intelligence programs.

Impact on society

The scope of the TAC ontology falls under the requirements for shared threat situational awareness as described in the NIS 2 Directive of the European Commission on measures for a high common level of cybersecurity across the Union.

Has your project directly involved or led to a specific recommendation or proposal for the development of new or revised standards? Or was it aimed at supporting the development or revision of a standard already under development?

YES - The development of the Threat Actor Ontology requires incorporating concepts from a multitude of domains and standards. The project has supported and provided recommendations to other technical committees and standards within the OASIS SDO. In particular, the CACAO, OpenC2, and STIX standards.

Has your fellowship contributed to the development of a new work group (WG) or a new technical committee (TC)?

YES - An ad-hoc working group was created for operationalising and validating outputs derived from the OASIS TAC TC and the OASIS Collaborative Automated Course of Action Operations Technical Committee (CACAO TC).

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 standards in this field are in preliminary phase. Additional EU Experts are needed to better support the EU position. A cyber threat intelligence ontology is undeniably an important technology to improving the EU's overall cybersecurity capability. The use case of the EU, meaning multiple nation-states that, for example, are required to collaborate during large-scale incidents and crises, demonstrates the importance of interoperability in threat information representation and sharing. A technical committee dominated mainly by US representatives requires more European experts to guide the definition of requirements and the development process of the ontology following a more EU-driven perspective.

Online references related to the fellowship work

⤓ https://github.com/oasis-open/tac-ontology

⤓ https://arxiv.org/pdf/2110.10540.pdf

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IEC 62351-14, Cyber security event logging for power systems

Erik Andersen
Independent consultant, Contributor.
Denmark

Sector

Cybersecurity / Network and information security

Engaged SDOs, WGs and TCs

IEC
IEC TC 57 WG 15

Addressed EU standardisation priorities and gaps

Many cyber-attacks are made possible by peoples' misbehaviour, like clicking on an unsafe link. Other attacks are made possible by installing unsafe programs or by bad physical protection. It is all about what people should do or should not do, i.e., it is about procedures. Much cyber security standardisation is concerned with procedures. A major part of government and EU cyber security activities are concerned with procedures, possibly because many cyberattacks are caused by missing or ignored procedures. However, here is a gap. Certain attacks are possible even when all procedures are in place and observed. Systems in a network communicates using standardised protocols. If these protocol standards do not specify secure authentication, encryption, support for access control, data integrity protection and many other safety features, systems based on such protocols are open for attacks. This latter aspect has less attention by authorities but is the priority for the fellowship.

Concerned ICT Standards and contribution to the related landscape

The ICT standard in question is IEC 62351-14, Cyber security event logging. IEC 62351-14 has been out as a committee draft (CD) with resolution completed. It is ready for being issued as a new CD for comments among members.

Within the landscape of ICT standards, it is a standard that goes across all most other standards in the IEC 62351 series of cybersecurity standards for the power industry. It provides guidelines and detailed specifications for how to format security events to be logged. In addition, it also has a detailed list of all types of identified security events for each of the relevant parts of the IEC 62351 series and event that goes across all parts.

Security events may be caused by programming errors, or it by an act of an adversary. It is important that a cybersecurity standard is documenting all conceivable exception situations. It is equally important that implementation can log any such exception condition for remedy to be taken. This is the aim of IEC 62351-14.

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

Impact on society

Cyber security attack is a major problem for the society. It has widely economic and human consequences. It is almost viewed in the same context as military threats. IEC 62351-14 objective is to ensure that any weakness in the products themselves are detected, documented and resolved quickly.

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Has your project directly involved or led to a specific recommendation or proposal for the development of new or revised standards? Or was it aimed at supporting the development or revision of a standard already under development?

YES- IEC 62351-14 was at Committee Draft (CD) state at the start of the fellowship. The fellowship has helped bring the coming standard a major step forward.

Has your fellowship contributed to the development of a new work group (WG) or a new technical committee (TC)?

YES - IEC TC 57 WG 15

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

YES – Technical report (Development of a new standard)

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

The standards in this field are in preliminary phase. Therefore, further actions are suggested. The next step will be to generate comments on the new Committee Draft (CD), participate in comment resolution to prepare a document that can be issued as a Committee Draft for Vote (CDV), prepare ballot comments on the CDV and prepare the standard for final publication probably at the beginning 2023.

Online references related to the fellowship work

N/A

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Strengthening AI standardization (ISO/IEC JTC1/SC42 and CEN/CENELEC JTC21)

Francisco Medeiros-Filho

Head of the Belgian delegation to ISO/IEC JTC1/SC42 and CEN/ CENELEC JTC21 for Artificial Intelligence

FM Tech Consult BV.

Belgium

Sector

Artificial intelligence

Engaged SDOs, WGs and TCs

CEN/CENELEC
ISO/IEC
CEN/CENELEC JTC21
ISO/IEC JTC1/SC42 WG1 & WG3.

Addressed EU standardisation priorities and gaps

CEN/CENELEC JTC21 is likely to reflect the ISO/IEC JTC1/SC42 current structure. Clearly, there is a knowledge gap to be bridged between AI standardisation at international level (ISO/ IEC) and at European level. The challenge from a European perspective still is to counteract the US and China massive efforts in the domain of AI standardisation. In this context, JTC21 should act as a catalyst for greater European influence at ISO/IEC level. The forthcoming EC standardisation request to European Standardisation Organisations (re: AI Act) will provide focus to JTC21 and much needed motivation.

Concerned ICT Standards and contribution to the related landscape

The funding has allowed me to coordinate the involvement of the Belgian delegation at international and European AI standardisation (ISO/IEC JTC1/SC42 and CEN/CENELEC JTC21). The Belgian AI mirror committee has increased to 23 representatives from academia, large industry, public sector and SMEs. In the context of SC42, I have focused on WG1 (Foundational standards) and WG3 (Trustworthiness).

Relevant standards are: ISO/IEC 42001 (CD Stage) "Information technology - Artificial intelligence - Management system"; ISO/IEC DIS 22989 "Information technology - Artificial intelligence - Artificial intelligence concepts and terminology"; ISO/IEC DIS 23053 "Framework for AI Systems using Machine Learning".

During the grant period I have attended the 2nd and 3rd meetings of CEN/CENELEC JTC21 and five meetings of the JTC21 Strategic Advisory Group (SAG#2 on 8 Sept, SAG#3 on 30 Sept; SAG#4 on 16 Nov, SAG#5 on 21 Dec, SAG#6 on 25 Jan 2022). JTC21 has not yet adopted any standardisation Work Items.

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

Impact on SMEs

Compliance with harmonised European standards (hEN) are a means for providers of AI systems to demonstrate conformity with the requirements of the proposed AI Regulation. The JTC21 standardisation work will have a direct impact on the industry, especially on

SMEs. Standards will be 'mandated' (via formal standardisation requests) by the European Commission. The Belgium delegation in JTC21 has been contributing to the preparatory work for future harmonised standards (hENs).

Impact on society

Compliance with harmonised European standards (hEN) are a means for providers of AI systems to demonstrate conformity with the requirements of the proposed AI Regulation. The standardisation work by CEN/CENELEC JTC21 will have a direct impact on the industry, especially on SMEs. The work will also facilitate innovation by SMEs and startups in the AI domain.

Has your project directly involved or led to a specific recommendation or proposal for the development of new or revised standards? Or was it aimed at supporting the development or revision of a standard already under development?

YES - ISO/IEC 42001.

Has your fellowship contributed to the development of a new work group (WG) or a new technical committee (TC)?

YES - SAG (Strategic Advisory Group) as WG1 under the newly established CEN/CLC JTC21 for Artificial Intelligence. I am the vice-convenor of SAG.

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

YES – Technical report (Recommendations for new/revised standards in the context of CEN/CLC JTC21 also adoption of ISO/IEC JTC1/SC42 standards by CEN/CLC. This work falls under 'road mapping' activities by SAG.)

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

I strongly recommend strengthening European coordination (re: AI standardisation) amongst the main European national standardisation bodies e.g. Germany, France, Belgium, Netherlands and Italy. Also, it is important to encourage other EU Member States to join these standardisation activities. I have contacted and had two meetings with the relevant Slovenian authority. The national standardisation body in Slovenia (SIST) was contacted and they have been encouraged to join the JTC21 activities.

Online references related to the fellowship work

See documents CEN/CLC/JTC 21 N 92 and ISO/IEC JTC 1/SC 42/WG 1 N 1335 and its previous versions.

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Standardisation of an AI Framework in the context of Motion Picture audio and Data by AI (MPAI)

Andrea Basso

Chair of the MPAI - AI Framework development committee
Director of Innovation at Synesthesia s.r.l
Italy

Sector

Artificial Intelligence

Engaged SDOs, WGs and TCs

ECMA
IETF
ISO/ IEC
ITU
MPAI-AIF DC Chair

Addressed EU standardisation priorities and gaps

Priority: AI technologies are yielding one of the fastest growing markets in the data analysis and service sector. It is a priority to enable industry to easily create innovative products based on AI.

Challenge: the current development model is in the hands of few big players and makes application redeployment difficult, monolithic and opaque.

MPAI's AI framework (AIF) enables building high-complexity AI solutions by interconnecting multi-vendor AI modules (AIMs) operating in a standard AI framework (AIF) and exchanging data in standard formats.

MPAI benefits:

1. Technology providers will be able to offer AIMs to an open market.
2. Application developers to access open market of AIMs.
3. Innovation will be fuelled by the demand for novel AIMs.
4. Consumers will be offered a wider choice of better AI applications by a competitive market.
5. Society will be able to lift the veil of opacity from large, monolithic AI-based applications.

Concerned ICT Standards and contribution to the related landscape

Moving Picture, Audio and Data Coding by Artificial Intelligence (MPAI) is an international non-profit organisation with the mission is to develop Artificial Intelligence (AI) enabled digital data compression specifications, with clear Intellectual Property Rights (IPR) licensing frameworks of Moving Picture, Audio and Data Coding, especially using new technologies such as Artificial Intelligence, and that facilitate integration of Moving Picture, Audio and Data coding components into systems.

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

Impact on SMEs

MPAI standards will facilitate innovative SMEs and in particular:

1. Technology providers will be able to offer their AI technology to an open market.
2. Application developers will find on the open market the AIMs their applications need.
3. Innovative SMEs will have access to an open market of AI technology that can be easily deployed.

Impact on society

Use of technologies based on Artificial Intelligence (AI) is extending to more and more applications yielding one of the fastest-growing markets in the data analysis and service sector. However, industry and society must overcome hurdles for stakeholders to fully exploit this historical opportunity: the current framework-based development model that makes application redeployment difficult, and monolithic and opaque AI applications that generate mistrust in users. MPAI – Moving Picture, Audio and Data Coding by Artificial Intelligence – believes that universally accessible standards can have the same positive effects on society as digital media standards and has identified data coding as the area where standards can foster development of AI technologies, promote use of AI applications and contribute to the solution of existing problems.

Has your project directly involved or led to a specific recommendation or proposal for the development of new or revised standards? Or was it aimed at supporting the development or revision of a standard already under development?

YES - My activity has been focused in the standardisation of an AI Framework inside the MPAI standard.

Has your fellowship contributed to the development of a new work group (WG) or a new technical committee (TC)?

YES - I am the Chair of the MPAI-AIF Development Committee.

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 current standards in AI are in very early stage and in great need. Artificial Intelligence (AI) is a resurgent technology experiencing significant advances. Since 2017, 14 of the world's most advanced economies have announced over 86 billion EUR in focused AI programs and activities. This growth in AI and the investment underpinning it has the potential to transform the lives of European, who are already keen and early adopters of AI. Alongside this opportunity, concerns have been raised about the impact of AI on the future of work, social inclusion and opportunity, among other issues. With these concerns, the interest in AI Standards to shape responsible design, deployment and evaluation of AI, and facilitate global adoption, has been growing and today is perceived as a key need. Support for this effort is key for Europe to ensure that an effective and responsible AI is developed.

Online references related to the fellowship work

https://mpai.community/wp-content/uploads/2021/11/N426-MPAI-14-Press-Release.docx

https://mpai.community/about/organisation/

https://mpai.community/standards/mpai-aif/about-mpai-aif/

https://mpai.community/standards/mpai-aif/draft-standard/

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SAIC3D - Seeds for an 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
ISO/IEC JTC 1 SC 29 WG 7

Addressed EU standardisation priorities and gaps

The activity is performed within the ISO/IEC MPEG 3D Graphics Coding WG and has two objectives (1) to investigate the potential value of AI based technologies for 3D graphics compression and, (2) to prepare a methodology for a potential Call for Proposal, including the generation of several draft documents. The first objective was addressed by organizing several sessions with experts in the field where technical aspects were analyzed in details. The second objective was addressed by producing several documents.

The 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 visualization (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.

All of them are detailed in the output documents produced by WG 7 at the October meeting.

Concerned ICT Standards and contribution to the related landscape

As the convenor of ISO/IEC JTC 1 SC 29 / WG 7 MPEG 3DG, following some exchanges with representatives from the industry and academia, I decided to create in July 2021 (before this project started) an AhG on «AI based 3D graphics coding». At the same meeting, WG 7 released four output documents in order to initiate the exploration of AI technologies for 3D graphics compression.

At the date when this funded application started (September 1st, 2021), the exploration activity for a new AI standard in WG 7 was active but still in an embryonic form. This project contributed to reinforce it with participation in three key documents:

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- ISO/IEC JTC 1/SC 29/WG 7 N173 Guidelines for conducting AI exploration experiments for PCC, MDS20721, 4th WG 7 online meeting (September 6th 2021)
- ISO/IEC JTC 1/SC 29/WG 7 N174 Performance analysis of currently AI-based available solutions for PCC, MDS20722, 4th WG 7 online meeting (September 20th 2021)
- ISO/IEC JTC 1/SC 29/WG 7 N175 Preliminary data set collection for AI experiments, MDS20723, 4th WG 7 online meeting (September 5th 2021)

In October 2021, WG 7 organized its 5th meeting and a session dedicated to AI technologies for 3D graphics compression was held on Wed 13th of October with 90 participants. During this session (that I chaired), 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, etc. The outcome of the session was the decision to continue the standardization work and issue a set of 4 new documents:

- N234, Preliminary Dataset Collection for AI-based Point Cloud Experiments, (2021-12-02)
- N233, Performance analysis of currently AI-based available solutions for PCC, (2021-12-02)
- N232, Guidelines for conducting AI exploration experiments for PCC, (2021-10-29)
- N229, EE 13.54 on AI tools for PC compression and analysis, (2021-10-29)

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.

Has your project directly involved or led to a specific recommendation or proposal for the development of new or revised standards? Or was it aimed at supporting the development or revision of a standard already under development?

YES - the project has a direct implication in supporting a new standard proposal. It refers to "Artificial Intelligence tools for graphics compression and analysis" and it is currently in the Exploration phase in ISO/IEC JTC 1 SC 29 WG 7.

Has your fellowship contributed to the development of a new work group (WG) or a new technical committee (TC)?

NO -

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

The work supported by the StandICT.eu produced the following deliverables:

- Alexandre Zaghetto (editor), Marius Preda (convenor), EE 13.54 on AI tools for PC compression and analysis, N 229, SC 29 WG 7 5th meeting, October 2021
- Jiahao Pang (editor), Marius Preda (convenor), Guidelines for conducting AI exploration experiments for PCC, N 232, SC 29 WG 7 5th meeting, October 2021
- Alexandre Zaghetto (editor), Marius Preda (convenor), Performance analysis of currently AI-based available solutions for PCC, N 233, SC 29 WG 7 5th meeting, October 2021
- Muhammad Asad Lodhi (editor), Marius Preda (convenor), Preliminary data set collection for AI experiments, N 234, SC 29 WG 7 5th meeting, October 2021
- Alexandre Zaghetto (editor), Marius Preda (convenor), EE 13.54 on AI tools for PC compression and analysis, N 280, SC 29 WG 7 6th meeting, January 2022
- Jiahao Pang (editor), Marius Preda (convenor), Guidelines for conducting AI exploration experiments for PCC, N 282, SC 29 WG 7 6th meeting, January 2022

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- Alexandre Zaghetto (editor), Marius Preda (convenor), Performance analysis of currently AI-based available solutions for PCC, N 283, SC 29 WG 7 6th meeting, January 2022
- Muhammad Asad Lodhi (editor), Marius Preda (convenor), Preliminary data set collection for AI experiments, N 284, SC 29 WG 7 6th meeting, January 2022

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Bringing SME' contribution in AI area within the ISO/IEC 29110 software engineering in VSEs
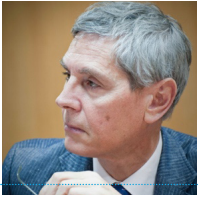
Fabio Massimo

Senior Consultant - Aesse.net, National President of CNA ICT Association
Italy

Sector

Artificial Intelligence

Engaged SDOs, WGs and TCs

ISO/IEC
ISO/IEC JTC1 / SC7 / WG24

Addressed EU standardisation priorities and gaps

Gaps: The lack of information about VSEs that are working on the AI field. There are plenty of companies which claim to be active in AI field, however they are very scattered both geographically and in terms of type of company and activity. There are associations which represent ICT companies however few of them represent VSEs, moreover AI is a new area, and it is impossible to know the level of representation of this area within the ICT associations. Likewise, there is a lot of literature about AI, however this is mainly academic and related to theoretical aspects and selecting articles on practical aspects related to VSEs within them it is a long process.

Priorities: Identify the needs of VSEs and the mapping study of the primary articles are the two priorities at the current stage of project development.

Challenges: The systematic mapping study of the AI articles and the extraction of the needs of AI VSEs/SMEs are the biggest challenges the project must face.

Concerned ICT Standards and contribution to the related landscape

I have been dealing with ISO 29110 software engineering in VSEs (Very Small Entities) that offers to entities having up to 25 people a set of tools to manage the life cycle of software systems. ISO 29110 provides the specifications for all profiles: SE, project management and service delivery.

Within 29110 context, a project has started aiming at developing a TR / Guide for using 29110 in Artificial Intelligence based software systems. As a member of the project team, I have collaborated to design the steps of the activity and to develop them. The steps of the project are:

1. Identify the features to be met for the specific domain of AI inside the VSEs by means of:

▷ a survey.

▷ study of the primary articles about the AI software engineering area.

2. Provide VSEs with guidelines on how AI-based software systems can be developed using 29110 considering the specific features of AI-based systems.

3. Verify that these guidelines are usable in European SMEs.

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

Impact on SME

I am one of the rare European experts who participate in the ISO SC7 WG 24 and I am the only expert who represents SMEs associations and is in strong relations with ICT and ICT user SMEs Associations. Through the associations I am engaged to involve AI SMEs on the one hand and distribute the results through other colleagues in the standardisation field on the other. At the end the aim is to try to impact and influence the European SMEs, possibly both ICT SMEs and no ICT SMEs.

Impact on Society

AI is expected to have important impacts both on work and on society. In a way it will be a revolution, but it is difficult to predict how it will develop.

As associations, our aim is to help European ICT SMEs to be part of this revolution and the standards are an important tool to compete in the international market, however European companies are less accustomed to using standards than their international competitors and this is true especially for ICT SMEs, therefore the societal impact we would like to achieve is to make ICT SMEs and their customers aware of the use of standard and internationally recognised techniques.

Has your project directly involved or led to a specific recommendation or proposal for the development of new or revised standards? Or was it aimed at supporting the development or revision of a standard already under development?

YES - The project where I am involved aims at publishing a specific guide for VSEs/SMEs in the context of part 5 "Management, engineering and service delivery guidelines" of ISO 29110 standard. Part 5 has been designed to be used directly by VSEs and their customers, part 5 provides specifications for the use and implementation of the standard and in particular of the profiles defined in part 4, "Profiles specifications" so it is likely that some profiles of part 4 will have to be modified or added in order to match the new requirements.

Has your fellowship contributed to the development of a new work group (WG) or a new technical committee (TC)?

NO

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

YES – Technical report (Reference material, new guide)What future efforts or activity are still necessary in your area of application?

The standards in this field are on preliminary phase; therefore, further actions are suggested.

The AI project is in on progress, some issues have been focused and intermediate outcomes have been achieved. The next steps of the project are: Map ISO/IEC 29110 for Systems Engineering and the ISO/IEC 29110 Agile Guide to identify the fundamental engineering practices and the engineering practices that should be modified or added to meet the new requirements and the AI VSEs needs. Evaluate the results and go toward the development of a guideline or a TS to apply ISO/IEC 29110 in AI-based software systems. The finalisation of the activities in development and the subsequent steps are expected to be completed in the first six months of the next year to be ready and presented to the next plenary of ISO JTC1 SC7 planned for June 2022.

The suggested action is to continue to cooperate with the WG 24 AI project in order to complete the project and to achieve the objective of producing the final document.

Online references related to the fellowship work

⤓ https://ec.europa.eu/eusurvey/runner/d45bdb74-160d-bc2b-ee13-e7d43d6ad95e

Towards autonomous BC-enabled 5G/6G networks

Francesc Wilhelmi
Postdoctoral researcher
Centre Tecnològic de Telecomunicacions de Catalunya (CTTC)
Spain

Sector

5G

Engaged SDOs, WGs and TCs

ITU-T Study Group 13 - ITU-T Focus Group on Autonomous Networks (FG-AN)

Addressed EU standardisation priorities and gaps

Through the adoption of blockchain technology as an open, decentralised, secure, and truthful manner to share information and perform digital transactions, this contribution aims to support the democratisation of telecommunications, which is expected to impact on other important fields such as healthcare, financial services, supply chains, or communications, by providing data protection, e-Identity, cyber security, or interoperability. Through this proposal, competitiveness in telecommunications is expected to be boosted by the entrance of new players (e.g., virtual operators, over-the-top providers), therefore contributing to generate more business opportunities and investments that can positively contribute to the post-pandemic recovery. As an example of lowering the entrance barrier in the telecom market, this proposal has introduced blockchain to the O-RAN to allow the leasing of virtual network resources in a transparent, reliable, and secure manner.

Concerned ICT Standards and contribution to the related landscape

My contribution to ICT Standards is at the intersection of 5G, network security, and artificial intelligence (AI). More specifically, the proposal is expected to enable autonomous networking by enhancing security and trust in procedures related to network operation and management in 5G+ and 6G. To that aim, I have proposed the integration of blockchain technology and AI for radio access network (RAN) management automation (more details are provided in the following sections). Based on a set of contributions involving architectural aspects and proof-of-concept implementation, I have contributed to the development of document FGAN-I-198 "High level architecture framework for Autonomous Networks" (still in progress), which is to be submitted to the parent group (ITU-T SG13) for consideration as a potential technical document. This proposal fits some digitalisation of industry and society goals of the EU, with openness and reliability being the cornerstones of the project.

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

Impact on society

Through blockchain-enabled economically-driven RAN management, where a dynamic secondary market exists, network users are expected to optimally choose between capital investment and resource use continuously, and not only at the time of the auction, contract

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signature, or network deployment. Resource trading allows for the establishment of dynamic and competitive markets, where new actors, besides the traditional MNOs appear, democratising and decentralising the telecom market. Such decentralisation is expected to positively impact the telecommunications sector, and the entrance of new players would allow improving the existing network infrastructure and services. In this regard, global connectivity may be prioritised to provide a consistent service everywhere, thus entailing a huge benefit to society due to the proven correlation between the reliable Internet connection and economic development.

Has your project directly involved or led to a specific recommendation or proposal for the development of new or revised standards? Or was it aimed at supporting the development or revision of a standard already under development?

YES - The project, through several action points, has culminated to the elaboration of a specific recommendation (still in progress) to be evaluated and processed by SG13. In particular, blockchain-enabled autonomous networking has been considered in the architectural framework defined in FGAN-I-198

Has your fellowship contributed to the development of a new work group (WG) or a new technical committee (TC)?

NO - But it may potentially lead to the extension of the ITU-T's Focus Group on Autonomous Networks (FG-AN)

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

YES – Technical specifications; Technical documents on blockchain-enabled autonomous networks have been submitted and presented to FG-AN.What future efforts or activity are still necessary in your area of application?

Given the exploratory nature of the concerned standards and specifications, further efforts are required to consolidate the adoption of blockchain in telecommunications, as well as to provide real autonomy to 5G+ and 6G networks. In this regard, three areas remain unexplored:

1) Standardisation of blockchain standards to define architectural frameworks, security, interfaces, and integration with multiple contexts (e.g., networks, medicine, banking).

2) Elaboration of use cases involving blockchain for network automation, especially in the area of network management and operation.

3) Implementation of proof-of-concept applications to smooth the adoption of blockchain-enabled autonomous networking in industry.

Online references related to the fellowship work

⮮ Magazine publication (open-access version): https://arxiv.org/abs/2107.02005

⮮ Attendance to 1st, 4th, 5th, and 6th meeting of FG-AN: reports FGAN-O-004, FGAN-O-011, FGAN-O-015, and FGAN-O-017 available at https://extranet.itu.int/sites/itu-t/focusgroups/an (ITU TIES access is required)

⮮ Contribution FGAN-I-007, FGAN-I-130, and FGAN-I-194 to FG-AN: documents available at https://extranet.itu.int/sites/itu-t/focusgroups/an (ITU TIES access is required)

⮮ Hosting a problem statement in 2022 ITU AI for 5G Challenge: https://supercom.cttc.es/index.php/ai-challenge-2022

⮮ To facilitate the access to meeting reports and contributions, I provide the following open repository: https://bitbucket.org/francesc_wilhelmi/contributions_fg-an/

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ITU SG13 Q3-2021-Q1-2022

Alojz Hudobivnik
ITU-T SG13 WP1 vice-chair
Telecommunication consultant, researcher and quality expert.
Slovenia

Sector

5G

Engaged SDOs, WGs and TCs

ITU-T SG13 WP1
ITU-T FG AN
ITU-T JCA IMT2020

Addressed EU standardisation priorities and gaps

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

Concerned ICT Standards and contribution to the related landscape

As an ITU-T SG13 WP1 vice-chairman "IMT-2020 (5G) and beyond network aspects" I have due to prolonged mandate into the year 2021 (postponed WTSA -20 in the year 2022 due to Covid measures) important obligations (management activities, presence on virtual/live meetings in Geneva, active involvement in decisions, steering the work of Questions) and big opportunity to influence the content of outcomes (documents in ITU-T Serie-Y, new WI decisions). As a recognised and experienced ITU-T expert, I contribute to aligning the SG13 plan, content, and standardisation objectives with EU objectives and to contribute and promote EU solutions. I am contributing to the fulfilment of the EU ICT Rolling Plan 2021. Inside FG AN I influence the formulation of all aspects of "Autonomous Networks".

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

Impact on SMEs

The EU Rolling Plan for ICT (2021) clearly define the importance of 5G infrastructure for verticals and needed actions:

"The Communication on ICT standardisation priorities for the digital single market proposes priority actions on 5G, some of which are reflected in section C.2."

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Has your project directly involved or led to a specific recommendation or proposal for the development of new or revised standards? Or was it aimed at supporting the development or revision of a standard already under development?

YES - I contribute to the following standards: Y.ICN-DOS: Requirements and capabilities of data object segmentation in information centric networking for IMT-2020 Y.DTN-ReqArch: Requirements and Architecture of Digital Twin Network Y.IMT2020-AIICDN-arch: AI integrated cross-domain network architecture for future networks including IMT-2020 Y.IMT2020-LC-req-arch: Future networks including IMT-2020: requirements and architecture for lightweight core-based dedicated networks Y.QKDN-qos-gen: General Aspects of QoS (Quality of Service) on the Quantum Key Distribution Network" Y.IMT2020-jg-lsn: Requirements and framework for jitter guarantee in large scale networks including IMT-2020 and beyond Y.FMC-EC : Unified edge computing for supporting fixed mobile convergence in IMT-2020 networks Y.FMSC-req: Requirements of fixed, mobile and satellite convergence in IMT-2020 network and beyond Y.SBN-TR : Service brokering network framework for Trusted Reality Y.FMC-AAEC-req: Use cases and Technical requirements for supporting application addressing in edge computing for future networks including IMT-2020 network

Has your fellowship contributed to the development of a new work group (WG) or a new technical committee (TC)?

YES - New ITU-T SG13 organizational plan (ToR) was prepared in 2020 and agreed at TSAG (1/2021) for Study period 2021-2024. It includes updated and new Question descriptions of ITU-T SG13.

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

YES - Technical Specifications Development of a news standard Recommendations for new/revised standards Reference material

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Finalisation of location-based spectrum sharing standardisation

Octavian Popescu
ETSI Member delegate, Consultant and company owner, EUCOMREG sprl
Belgium

Sector

5G

Engaged SDOs, WGs and TCs

ETSI
World Class Standards

ETSI Technical Committee (TC) Reconfigurable Radio Systems (RRS)

Addressed EU standardisation priorities and gaps

At EU level there are no tools for allowing regulators to control spectrum sharing by different technologies. Spectrum sharing of certain frequency bands is curtailed by the lack of appropriate control tools for regulators who are in charge of spectrum sharing policies.

Standardisation will offer the possibility for regulators to exercise better control of the radio activity and electromagnetic radiation due to the radio activity.

A standardised set of requirements to be implemented in the radio interface of devices complying with the Harmonised Standard will give the radio interface developer a clear path for creating products that can share the spectrum without interfering in the protected areas.

Such requirements will also be defined for a geographic accuracy that regulators consider to be adequate, and that the radio interface developer can implement and test for conformity with the standard.

Concerned ICT Standards and contribution to the related landscape

Standardisation of location-enabled radio interfaces may play a significant part in offering manufacturing companies adequate means of compliance with requirements formulated by regulators. Currently this topic is discussed in the Reconfigurable Radio Systems (RRS) technical committee (TC) in ETSI: TC RRS, under Work Items: 'RTS/RRS-0153' which will result in a Technical Specification (TS) and 'RTR/RRS-0153' Technical Report (TR).

My funded application enabled me to contribute with two drafts:

▷ the TS 103 655 Radio Interface Engine (RIE) Technical Requirements.
▷ the TR 103 587 Feasibility Study of a Radio Interface Engine.

Once published by ETSI, these two documents should be the starting point for the location-enabled RIE standard.

Currently such standard doesn't exist, however several standards incorporate elements of location-based spectrum sharing based on different technology implementations, for example geo-location databases.

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

Impact on SMEs

If successfully achieved by the publication of a harmonised European standard, such a standard will enable access to a better spectrum sharing situation and larger bandwidth for connectivity using radio devices produced and developed by and for European SMEs.

In the event of a freely accessible standard, with a standardised unified set of requirements that are equally applicable to all technologies SMEs will have a more level playing field, irrespective of geographical situation.

Impact on society

In the event of a freely accessible standard, with a standardised unified set of requirements that are equally applicable to all technologies SMEs will have a more level playing field for accession especially to the license-free spectrum, irrespective of geographical situation if they implement such protection measures as are imposed by local regulations.

In other words, the national boundaries inside the EU and for associated countries may not represent the limits of usage for technologies currently active only in certain countries, as is the case with the Commission Implementing Decision (EU) 2018/1538 of 11 October 2018 on the harmonisation of radio spectrum for use by short-range devices within the 874-876 and 915- 921 MHz frequency bands.

Has your project directly involved or led to a specific recommendation or proposal for the development of new or revised standards? Or was it aimed at supporting the development or revision of a standard already under development?

YES - My recommendation is to study the proposed set of requirements using different scenarios and involving incumbent technologies and candidate spectrum-sharing technologies. Such studies are needed to produce a standard.

Has your fellowship contributed to the development of a new work group (WG) or a new technical committee (TC)?

NO

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

YES – Technical report (Reference material); Technical report (Recommendations for new/ revised standard):

Finalisation of location-based spectrum sharing standardisation is contributing work to the following Work Items:

RTR/RRS-0153: Feasibility study of a Radio Interface Engine (RIE) is a revision of Technical report (TR) Version 1.1.1. In addition to the published TR 103 587 1.1.1 DTR/RRS-0147, new use cases shall be described, including location based enabling of the radio interface. - RTS/RRS-0153: Technical Study (TS) of the Radio Interface Engine (RIE); Part 1: Technical requirements where new requirements are added, including requirements related to location based enabling of the radio interface.What future efforts or activity are still necessary in your area of application?

My current work is on ETSI RRS deliverables which are Technical Reports TR 103 587, and TS103 655. With the changes I proposed, both drafts should be in the level of stable draft moving to final draft during this year. The technical reports are a preliminary stage ahead of actual standardisation and where they could be considered sufficient for starting a standardisation work item or they may need more supporting studies in order to begin the standardisation. Further studies are needed to produce a standard.

Technical Reports TR 103 587, and TS103 655 are ETSI RRS deliverables aimed at documenting use cases, with possible use case scenarios, and the possibilities of incorporating the set of requirements in the functionality of the radio interface engine. Also, the RRS work demonstrates that the set of requirements can be, or are already implemented in the radio equipment in features that result in testable capabilities with measurable parameters. However, this should be further proved in further studies.

Online references related to the fellowship work

ETSI contributions are posted on the ETSI portal which is accessible for ETSI members.

⤓ The link to ETSI TC RRS Contributions is https://portal.etsi.org/ tb.aspx?tbid=718&SubTB=718#/

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From Federated Autonomics Standardization Towards Federated Testbeds and Testbed as a Service

Muslim Elkotob
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Germany

Sector

5G

Engaged SDOs, WGs and TCs

ETSI
IEE
ITU
ETSI TC INT
IEEE INGR SBB
INGR SysOpt - INGR Testbeds

Addressed EU standardisation priorities and gaps

Gaps

▷ Standardizing Testbed as a Service (TaaS) concept to enable scalability and leveraging capabilities for collaboration and asset sharing.

▷ Lack of standards-backed interoperability to ensure a fair share among stakeholders in FT on innovations and Time-to-Market acceleration for products and services.

Priorities

▷ Establishing a platform to help harmonize testbeds specs across SDOs and leverage and align with the Testbed Federation Reference Model   https://www.itu.int/ITU-T/recommendations/rec.aspx?rec=14765 (approved)

▷ Aligning roadmaps of different stakeholders and SDOs with focus on FT.

Challenges

▷ Capturing specific properties of testbeds across stakeholders and eco-systems in an inclusive model for federation.

▷ Helping SDOs collaboratively work and share the burden of collaborating in the space of Federated Testbeds with sharing content, mechanisms for federations such as APIs, and procedures, whereby they all align to a common set of design and operational principles. Concerned ICT Standards and contribution to the related landscape

It is contributing to ICT Standards by taking Federated Testbeds to a new level with higher interoperability, flexibility and standardised mechanisms for asset sharing and promoting the use of and need for Open APIs. I contributed to ITU-T SG11 (https://www.itu.int/ITU-T/recommendations/rec.aspx?rec=14765) and launched a new Work Item on Fed.Testbeds that produced the ITU-T SG11 Recom. because Fed. Testbeds are key to enabling to test Fed. Autonomic Management&Control (AMC). I collaborate as ETSI TC INT/AFI with ETSI MTS on Testing AI Models like ETSI GANA Decision Elements (DEs). I have been driving as Contributor/Rapporteur Use Cases to leverage the concept of Federated Testbeds, namely the ICT ETSI Standard on E2E AI-powered AMC Across Multi-Domain 5G, (Ref. Nr. DTR/INT-00900). I joined the ETSI 8th UCAAT Program Committee and presented a paper I co-authored on Fed. Autonomics.

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

Impact on SMEs

The ITU-T SG11 Ref Model for Federated Testbeds has an inclusive purpose to leverage collaboration and monetisation of Testbeds assets and services among stakeholders in the eco-system of Testbeds for 5G and Beyond. SMEs are often integrators and they have a potential to become testbed suppliers, and they join the business cycle through the Ref. Model. The Testbed-as-a-Service (TaaS) concept resulting from the ongoing work enables SMEs to expose and monetise on their ICT and Testbed assets.

Impact on society

Inclusion and benevolent competition principles by enabling new ecosystems and value chains in ICT. The achieved reference models for Federated Testbeds and Federated Autonomics enable the participation of SMEs, especially of the ISV (Independent Software Vendor) type, and other innovative disruptive players with limited assets but innovative algorithms and services in use-cases and scenarios in 5G and Beyond. Smaller businesses and players can more actively take part in monetisable business cases, they can lease and borrow technology assets via federation, become software suppliers to other stakeholders, and thus to create an inclusive and pro-SME set of eco-systems.

Has your project directly involved or led to a specific recommendation or proposal for the development of new or revised standards? Or was it aimed at supporting the development or revision of a standard already under development?

YES

My work in this project supports several new and revised standards within ETSI (TC INT and TC INT AFI) and ITU including: - ETSI Deliverable Technical Report (TR): Draft for TB Approval for the instantiation of the ETSI GANA model onto IMS architectures (stable draft (ETSI TR) completed and submitted for revision in October 2021.

INT Artificial Intelligence (AI) in Test Systems and Testing AI models; Use and benefits of AI technologies in Testing; DTR/INT-00166, 00181: and DTR/INT-00181

Has your fellowship contributed to the development of a new work group (WG) or a new technical committee (TC)?

NO

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

YES - Technical report (development of a new and revised standard)

My project and the work done within by myself was worth the effort and contributed largely to several specific deliverables in standardisation; those include:

▷ ITU-T Deliverable: Open APIs for interoperable testbed federations; Work item: Q.4068 (ex Q.API4TB) https://www.itu.int/ITU-T/recommendations/rec.aspx?rec=14765
▷ ETSI Deliverable Technical Report (TR): Stable Draft of ETSI TR DTR/INT-00900 (as Contributor and Rapporteur: Muslim Elkotob) End-to-End AI-powered Autonomic Security Management & Control Across Multi-Domain 5G Networks; https://portal.etsi.org/webapp/workProgram/Report_WorkItem.asp?wki_id=63106

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

The standards in this field are mature but I suggest continuation of actions. The achieved work on Federated Autonomics, Federated Testbeds, and Eco-System evolution with openness,

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disruption, and disaggregation (opening the door to SMEs participation and constructive competition) has led to several standards (ETSI, ITU-T), but the potential this work unleashes is immense, and further standards are needed to instantiate the derived models on different use-cases and verticals, and also to detail-out more the models derived to reduce time to market.

Online references related to the fellowship work

- https://portal.etsi.org/webapp/WorkProgram/Report_WorkItem.asp?WKI_ID=63106

- Open APIs for interoperable testbed fed.; WI:Q.4068(ex Q.API4TB) https://www.itu.int/ITU-T/recommendations/rec.aspx?rec=14765

- Stable Draft of ETSI TR DTR/INT-00900 (Contributor and Rapporteur Muslim Elkotob) E2E AI-powered Autonomic Security Mgmt & Control Across Multi-Domain 5G Networks; https://portal.etsi.org/eWPM/index.html#/home?WKI_ID=63106

- Draft created for the ETSI TR on Use Cases for Testbeds Fed.: the case of Test ETSI GANA Autonomics Components

- INT Artificial Intelligence in Test Systems and Testing AI models; Use and benefits of AI tech. in Testing; DTR/INT-00166,00181: https://portal.etsi.org/webapp/WorkProgram/Report_WorkItem.asp?WKI_ID=59455 and DTR/INT-00181: https://portal.etsi.org/webapp/WorkProgram/Report_WorkItem.asp?WKI_ID=59577

- Draft for TB Approval for instantiation of ETSI GANA model onto IMS arch. https://portal.etsi.org/webapp/WorkProgram/Report_WorkItem.asp?WKI_ID=54805

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Standards for Quantum Photonic Integrated Circuits

Richard Pitwon
Consultant
Resolute Photonics UK Ltd.
United Kingdom

Sector

Quantum Technology

Engaged SDOs, WGs and TCs

IEEE
IEC TC86/SC86C/WG4
BSI Quantum Technology Panel
CEN/CENELEC FGQT
ISO/IEC JTC1 WG14

Addressed EU standardisation priorities and gaps

The purpose of this project will be to identify the future standardisation requirements for QPICs, which are the most important enabling technology for quantum applications and to introduce QPICs to mainstream standards organisations. The key priorities of this activity will be: 1) Organise a joint IEEE/IEC/ITU/EU Quantum Flagship symposium to bring together EU QPIC stakeholders and identify QPIC standardisation requirements and limitations, 2) Form an IEEE Special Interest Group for quantum technologies in the UK and Ireland Section, 3) Engage with EU and UK QPIC stakeholders to enlist their contributions and/or participation in a mainstream international standards group (IEC TC86 SC86C/WG4) to start development of a QPIC standardisation framework, 4) Create and present a proposal within IEC TC86/SC86C/WG4 for a Technical Report introducing QPIC technologies. This will require travel to the IEC TC86/SC86C meeting in the USA in March 2022.

Concerned ICT Standards and contribution to the related landscape

Quantum Photonic Integrated Circuits (QPICs) are an emerging enabling technology for applications including quantum communications, quantum computing (optical and trapped ions), quantum sensing and quantum imaging. These applications require integrated quantum photonics technology to support scale-up, robustness, cost/size reduction (SWAP-C) for commercial products to become a reality. Other markets are the traditional integrated photonics markets (telecommunication, data-centres, sensing), where QPIC technology will bring a step-change in performance.

QPICs will be the critical components for these quantum applications and there is no standardisation activity at the moment, which addresses them.

This fellowship has already resulted in the successful organisation of a joint, cross-SDO symposium on QPICs and the formation of an IEEE UK and Ireland Quantum Group. This activity will result in a section on QPICs to be added to an "IEC Technical Report - Introduction to Quantum Technologies", which was started under a previous OC fellowship and is currently under development.

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

Impact on SMEs

Quantum Photonic Integrated Circuits (QPICs) are a critical enabling technology for applications including quantum communications, quantum computing (optical and trapped ions), quantum sensing and quantum imaging. A large number of EU and UK SMEs have emerged recently to develop QPIC technology. This contribution will help EU/UK SMEs to gain early access and influence on the first standardisation efforts on QPICs, thus helping the EU and UK secure a critical advantage.

Has your project directly involved or led to a specific recommendation or proposal for the development of new or revised standards? Or was it aimed at supporting the development or revision of a standard already under development?

NO - The first deliverable of this fellowship was the organisation of a Joint ITU/IEC/IEEE Symposium on Quantum Photonic Integrated Circuits. This was successfully organised and run by the consultant on 2nd November 2021 and brought together experts from different standardisation groups as well as technical experts. In extensive discussions following this symposium with varied standardisation experts, in particular from IEC SC86C/WG4, which is the WG for PIC technology, it was determined that QPICs were an advanced technology, and that standards should be introduced, but only following the completion of the Technical Report on Quantum interconnect, which is being addressed in a parallel fellowship project. The Technical Report will introduce quantum technologies to all subcommittees of the IEC TC86 technical committee on Fibre Optics, which is one of the largest TCs in the IEC.

Has your fellowship contributed to the development of a new work group (WG) or a new technical committee (TC)?

YES - This project has led directly to the formation by the consultant of the IEEE UK and Ireland Quantum Group, which was formed and ratified by the IEEE UK and Ireland Section in the first month of the fellowship project. This is a technology special interest group, which will promote quantum engineering as a discipline and promote standardisation of quantum technologies.

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

YES - Based on the discussions held following the Joint ITU/IEC/IEEE symposium on quantum photonic integrated circuits organised on 2nd November, it was determined that either a new Technical Report should be proposed within the IEC dealing with QPICs or the Technical Report already in preparation on a parallel fellowship project be extended with chapters dealing specifically with QPICs.

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IoT Semantic Interoperability Specialization to Preventive Health, Well-Being and AI

Amélie Gyrard

Research & Innovation Consultant: IoT and AI Semantic Interoperability, Well-Being & Standards at Trialog. France

Sector

Internet of Things

Engaged SDOs, WGs and TCs

ISO/IEC JTC1-SC41/167/CDV
ISO/IEC JTC 1/SC41 Internet of Things and Digital Twin

Addressed EU standardisation priorities and gaps

▷ Contribution to 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);

▷ Contribution to 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

Trialog co-editor of JTC1-SC41/167/CDV - ISO/IEC 21823-3 ED1: Internet of Things (IoT) - Interoperability for IoT Systems - Part 3: Semantic interoperability.

Trialog sent contributions to ISO/IEC 5392 Knowledge Engineering Reference Architecture (KERA)

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

Impact on SMEs

As Research & Innovation Consultant at Trialog (French SME), my StandICT.eu's fellowship will directly impact the work on IoT and AI Semantic Interoperability, Well-Being & Standards carried out in my company.

Has your project directly involved or led to a specific recommendation or proposal for the development of new or revised standards? Or was it aimed at supporting the development or revision of a standard already under development?

YES

▷ ISO/IEC 21823-3 IoT Semantic Interoperability

▷ ISO/IEC SC42 AI WG05

▷ AFNOR CN IA - 5392 Knowledge Engineering Reference Architecture (KERA)

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▷ ISO/IEC SC42 AI WG05

▷ AFNOR CN IA - Ontologies, Knowledge Engineering, and Representation (OKER) Report - Draft

Has your fellowship contributed to the development of a new work group (WG) or a new technical committee (TC)?

NO

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

YES

▷ Technical report: ISO/IEC SC42 AI WG05 - AFNOR CN IA - Ontologies, Knowledge Engineering, and Representation (OKER);

▷ Report - Draft New standard: ISO/IEC SC42 AI WG05 - AFNOR CN IA - 5392 Knowledge Engineering Reference Architecture (KERA)

Danish participation in the ISO/IEC JTC 1/SC 32 WG 3 Database languages (SQL and new GQL), 2nd term

Thomas Frisendal
Danish expert in the ISO WG standardizing SQL and the new GQL standards, TF Informatik/Thomas Frisendal.
Denmark

Sector

Big Data and Open data

Engaged SDOs, WGs and TCs

ISO
DS
ISO IEC/JTC1/SC32/WG3 Database languages

Addressed EU standardisation priorities and gaps

Focusing on the forthcoming Graph Query Language standard with emphasis on business requirements and human factors. 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 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 also some strong presence from Asia.

Concerned ICT Standards and contribution to the related landscape

Database language standards (SQL/GQL) as Danish expert to ISO IEC/JTC1/SC32/WG3 (with special emphasis on Graph Query Languages). The committee is responsible for the widely used SQL standard, and it is also developing a new query language, Graph Query Language, GQL.

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

Impact on SMEs

Database languages and graph database technologies supplemented with Machine Leaning (ML) are very important for SMEs, not least because the lower learning curves, intuitiveness, and productivity. Keeping the learning curve low is of essence.

Impact on society

The ease of understanding of complex data is essential for modern societies. Just look at the impacts of big data and machine learning.

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Has your project directly involved or led to a specific recommendation or proposal for the development of new or revised standards? Or was it aimed at supporting the development or revision of a standard already under development?

YES

My January discussion paper generated 4 so-called Language Opportunities for further discussions. SQL is a standard being revised (extended with SQL-PGQ), and GQL is a new standard.

Has your fellowship contributed to the development of a new work group (WG) or a new technical committee (TC)?

NO

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

YES – Technical report/Discussion papers and language opportunities.What future efforts or activity are still necessary in your area of application?

SQL: Very mature, but developing a graph query interface, which will go into Draft International Standard with the next 6 months. GQL: Still in internal working draft status but will invite comments on a Committee Draft version in 2022 (according to the current plan).

Additional EU Experts are needed to support the EU position. Today, only 7 EU citizens participate, who are not representing database vendors (who have 7 EU-based members). The US and Asian participation have many more members of the WG.

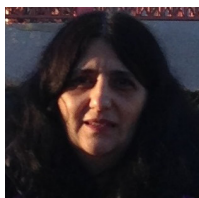## Online references related to the fellowship work

N/A

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2.
Societal Challenges

Standardisation actions towards the safety of EU citizens during emergency situations - Part 2

Michelle Wetterwald

Senior standardisation expert in networking & mobile communications

Networking and Mobile Systems expert at Netellany France

Sector

Emergency communication

Engaged SDOs, WGs and TCs

ETSI
ETSI TC EMTEL

Addressed EU standardisation priorities and gaps

The report was analysed as part of my previous fellowship. The study concluded that the Technical Report (TR) would be very useful to emergency services and decision-makers when establishing their communication networks, but the application of its content to communications networks is mostly outdated because the document is 14 years old. The TR would need a deep revision. Another point raised was that the scope of the TR goes beyond mobile and radio networks and applies both to wireless and fixed lines. However, many of the definitions in the document are generic but still valid. If TR 102 445 is not revised, it will be withdrawn and integrators designing networks for emergency services will have to use fragmented information provided by the different SDOs, when they exist, instead of finding all relevant guidelines in a single reference document.

Concerned ICT Standards and contribution to the related landscape

This work will enhance the capability of ETSI standards to improve European citizens' safety and prevent injuries and fatalities during emergency situations (ETSI TC EMTEL). The unexpected events and disasters that occurred since the start of the 21st century demonstrated that being able to communicate in emergency situations allows to alleviate the number of injuries and fatalities brought by these events. Even in more normal situations, calling an emergency number and asking for help can be crucial. Communication systems and networks must be designed to resist the impact of unforeseen hazards and enable the system to return to a previous normal condition in case of failure. This work addressed ETSI TR 102 445 that provides guidelines for preparedness and resilience of emergency communication networks and needs to be updated, as it was lastly published in 2006.

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

Impact on SMEs

SMEs are indirectly impacted by these actions as they may be able to develop new services complying with this standard if it is revised.

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Impact on society

The actions in this fellowship bring the capability to ETSI to improve European citizens' safety and prevent injuries and fatalities. The revision of this Technical Report has the potential to prevent and fasten the resolution of emergency network failures in Europe. The failure of the emergency calling network in France in June (2021) demonstrated that this is an important topic.

Has your project directly involved or led to a specific recommendation or proposal for the development of new or revised standards? Or was it aimed at supporting the development or revision of a standard already under development?

YES - Proposal for the revision of ETSI TR 102 445:

Has your fellowship contributed to the development of a new work group (WG) or a new technical committee (TC)?

YES - ETSI TC EMTEL. This committee recently changed its Terms of Reference to become an ETSI Technical Committee, as it now publishes important specifications for next generation of public safety communications.

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

YES – Technical report (Project proposal for the revision of an obsolete standard)

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

The report is obsolete and needs revision, therefore continuation of action is suggested. The project has been approved at committee level, but it needs now to be approved by ETSI governing bodies to be able to really start. The committee still needs my support until final approval decision in 4Q21. This is the objective of my nest application.

Online references related to the fellowship work

All documents that demonstrate my work are internal to ETSI members.

The contribution numbers are EMTEL(21)000017, EMTEL(21)000017r1, EMTEL(21)000016, EMTEL(21)000016r1 and EMTEL(21)000028. The first four are my contributions, the last one is the TC EMTEL meeting report.

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Contribute to re-launch of CEN/CENELEC TC353 ICTLET

Erlend Øverby
International recognized expert
Chair of ISO/IEC JTC 1/SC 36 since 2011 – 2021,
Founder of Hypatia Learning AS, an EdTech company
Sweden

Sector

Education, Digital Skills and Learning

Engaged SDOs, WGs and TCs

CEN TC353 Information and Communication Technologies

Addressed EU standardisation priorities and gaps

The need for a digital ecosystem primarily for the formal educational sector in Europe. Realising that all EdTech standards would benefit all aspects of learning, education and training that used EdTech tools and services.

There is a huge gap and differences in the requirements for use of technology within our educational sector. The goal of re-establishing CEN TC353 is to provide better harmonisation of how EdTech could work together to support the purpose of our educational institutions. In addition, European standards will also enable global expansion for most European EdTech companies that implement the standards developed.

Concerned ICT Standards and contribution to the related landscape

My funded application gave me the opportunity to assist and work with the Chair and Secretariat of CEN TC353, and to draft a plan for how to re-establish CEN TC353 as a relevant and important standardisation committee in Europe. We also proposed a new structure of how the committee.

I drafted 8 proposed standards as listed:

1. Use of digital resources, tools and services free of barriers.
2. API and data model for reporting of learner attendance.
3. API and data model for reporting of learner grades.
4. Common methods and procedures for reporting comparable xAPI statements from different systems.
5. Curricula semantic information elements.
6. Governance of data produced by learners from using digital learning resources, tools and services.
7. Semantic metadata for a digital learning ecosystem.
8. Common secure Identify and Access Management (IAM) system and attributes for users within educational institutions.

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

Impact on SMEs

The standards being proposed and developed by CEN TC353 will have an impact to the European EdTech industry with more than 2400 companies.

Impact on society

Hopefully my contributions to a standardised ecosystem for the European Educational sector will have a tangible long-term impact on children's education.

Has your project directly involved or led to a specific recommendation or proposal for the development of new or revised standards? Or was it aimed at supporting the development or revision of a standard already under development?

YES - We have proposed a new structure of TC, and we have proposed 8 new standards (sse above).

Has your fellowship contributed to the development of a new work group (WG) or a new technical committee (TC)?

YES - We have contributed to the re-establishment and focus of CEN TC353. We have proposed to establish several Working Groups and standardisation activities to take place within those groups.

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

YES - Our work has led to the re-establishment of CEN TC353, and a proposed structure with Advisory Groups and Work Groups. In addition have we proposed 8 new work items for European standardisation.

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

The standards in this field are in preliminary phase, therefore I suggest continuation of actions. To continue the support of the development of EdTech standards in Europe, further support is necessary, both to experts participating in developing the standards, and support to the convenors of the different working groups managing the work. The development of technical requirements and standards for use by the European Educational sector should be supported by the relevant European Commission DG.

Online references related to the fellowship work

N/A

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3.

INNOVATION FOR DIGITAL SINGLE MARKET

Standard eInvoicing implementations in Ireland

Edmund Gray
Chair NSAI eProcurement SC
Tubbercurry Software Ltd.
Ireland

Sector

e-invoicing

Engaged SDOs, WGs and TCs

CEN/CENELEC
CEN/TC 434

Addressed EU standardisation priorities and gaps

EN 16931 has many optional elements so my work was to get Public Bodies in Ireland to agree to a single set of requirements, thereby simplifying the implementation requirements for Suppliers, particularly SMEs, who use the standard.

Concerned ICT Standards and contribution to the related landscape

EN16931 is an eInvoice standard that has been mandated for all Public Bodies in Europe to be able to process any invoice received that is compliant with the EN.

The results of my work provide real use cases for CEN/TC 434. The standard needs to be refined/updated over time. This can then be fed back into future updates of the standard.

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

Impact on SMEs

EN16931 is a standard that all SMEs in Europe will require. Currently it is mandated to all Public Bodies. Some countries have also mandated businesses to provide only invoices in this format. In the coming years VAT submissions to Revenue will also be solely based on this standard.

Impact on society

Ultimately by simplifying the implementation process it will hasten the replacing of paper invoices with eInvoices based on EN16931.

According to the EU Commission, the adoption of eInvoicing in the public sector can make various contributions to economic well-being:

▷ it contributes to public policy priorities such as public-sector deficit reduction, financial transparency and promotion of sustainable development.

▷ it will specifically make a material contribution to public sector cost reduction and efficiency.

▷ it will also provide benefits to private sector suppliers and create opportunities for the public sector to act as a catalyst for the wider adoption of digital processes in common with the private sector.

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Has your project directly involved or led to a specific recommendation or proposal for the development of new or revised standards? Or was it aimed at supporting the development or revision of a standard already under development?

YES - The work undertaken here can be used to inform CEN/TC 434's work on EN 16931that will be used to inform future updates.

Has your fellowship contributed to the development of a new work group (WG) or a new technical committee (TC)?

NO

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

YES – Technical report: The key deliverable of this project is a simplified common usage specification was produced that is designed to help Suppliers to Public Bodies, particularly SMEs implement EN16931.

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

The standards in this field are mature. However, continuation of actions is suggested. The specification produced will require maintenance to ensure it best fits its purpose, particularly as the use of the standard increases.

Online references related to the fellowship work

N/A

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■ ISCC – International Standard Content Code

Sebastian Posth
Innovator, Entrepreneur & Consultant
ISCC Foundation
The Netherlands

Sector

Blockchain and Distributed Digital Ledger Technologies

Engaged SDOs, WGs and TCs

ISO
DIN

DIN
ISO/TC 46/SC 9/WG 18
ISO/TC 307/WG 6

Addressed EU standardisation priorities and gaps

▷ Media organisations are facing the problematic situation deriving from the ever increasing amount of digital content managed by large (mostly US-based) corporations.

▷ In lack of an international standard those corporations use their own proprietary identifiers (Amazon ASIN, Google GKey/Content-ID, Apple-ID) to manage 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.

▷ ISCC codes, can be generated decentralised 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 is a major innovation for the media industries and the creative community.

Concerned ICT Standards and contribution to the related landscape

The ISO WG 18 on ISO/AWI 24138 International Standard Content Code (ISCC) is part of ISO/TC 46/SC 9, thus strongly connected to the range of existing identifier standards for digital content and physical media, like ISBN, DOI, ISRC etc. The ISCC has been welcomed by members and experts of TC 46 as a new and relevant supplement, and a complementary to the existing TC 46 identifier standards that will support media industries and creative community online.

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

Impact on SMEs

The ISCC is designed as open and accessible identifier standard to manage digital content in decentralised media environments. This is a fundamental prerequisite for efficient or automated licensing transactions online. The ISCC will support SMEs (media publishers, retailers, collecting societies and other stakeholders in Europe) to claim rights to copyright protected works and prevent misappropriation and abuse online.

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Impact on society

In the ballot, we received very positive comments that specifically emphasised the benefits of the project for the cultural and creative community and IP rights management.

Has your project directly involved or led to a specific recommendation or proposal for the development of new or revised standards? Or was it aimed at supporting the development or revision of a standard already under development?

YES - the project led to the development of a new standards work item: ISO/AWI 24138 Information and documentation — International Standard Content Code

Has your fellowship contributed to the development of a new work group (WG) or a new technical committee (TC)?

YES - the fellowship contributed to the development of a new work group (WG), which was created in 2019: ISO/TC 46/SC 9/WG 18 (ISO/AWI 24138 International Standard Content Code) https://www.iso.org/committee/48836.html

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

YES - The new proposal NP has been approved by all members of the ISO working group to become an accepted work item ISO/AWI 24138 International Standard Content Code

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

The standards in this field are mature. However, continuation of actions is suggested. The AWI 24138 is now on a defined track to become an international standard with appreciation and support from all 31 member states, participating in the working group.

The target release or publication of the work is 2024-10-15, but we hope to get the standard published one year earlier.

Online references related to the fellowship work

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

https://iscc.codes/

https://github.com/iscc/

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Global and consistent blockchain and DLT standards on Security, Privacy, Identity

Julien Bringer

CEO and expert, Kallistech. France

Sector

Blockchain and Distributed Digital Ledger Technologies

Engaged SDOs, WGs and TCs

ISO
ISO/IEC
ISO/TC 307, ISO/TC 307/JWG 4 (co-convenor), ISO/TC 68/SC 2 (liaison representative of TC 307)
CEN/CENELEC JTC 19, ISO/IEC JTC 1/SC 27

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

Guiding 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 particular in fintech/regtech area, management of identities, and privacy-sensitive applications. This application includes all the security, privacy and identity standards developed in ISO/TC 307; for instance the ones related to cybersecurity requirements and assurance of blockchain/DLT systems, decentralised identity management, and enhanced privacy protection.

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. Besides, many SMEs in EU are positioned around decentralised identity and 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-sovereigned identity concept).

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Has your project directly involved or led to a specific recommendation or proposal for the development of new or revised standards? Or was it aimed at supporting the development or revision of a standard already under development?

YES - ISO/AWI 7603 Decentralised Identity standard for the identification of subjects and objects has been launched in November 2021. Plus, there are discussions of other potential projects, in particular there is a PWI (preliminary work item) on privacy that has been started in September 2021.

Has your fellowship contributed to the development of a new work group (WG) or a new technical committee (TC)?

NO

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

YES – Technical report/Reference material

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

The standards in this field are in preliminary phase. Therefore, further actions are suggested. 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/years, in particular with the new project ISO/AWI 7603 that will take at least 2 years following the usual standard development track

Online references related to the fellowship work

On-going projects are recorded in working program of JWG4 and JTC19

Participated in December to

https://inatba.org/events-calendar/blockchain-standardisation/

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■ Finalizing ISO TS 23635 as convenor

Roman Beck
Professor at IT University of Copenhagen
Head of the European Blockchain Center
Convenor of ISO TC 307 WG 5 "Blockchain Governance"
Denmark

Sector

Blockchain and Distributed Digital Ledger Technologies

Engaged SDOs, WGs and TCs

ISO cen CENELEC

CEN/CENELEC
ISO TC 307

Addressed EU standardisation priorities and gaps

The TS will provide guidance for Blockchain developer and users alike by providing principles and guidelines how governance should be organised in permissionless and permissioned DLT systems. In so doing, it is the first of its kind ISO standard that is dealing with decentralised governance and how to best organise it. In my role as convenor, I am orchestrating the project activities, and my major responsibility is keeping the project(s) on track and schedule, arranging meetings and liaisons, ensuring that the discussions in the workgroup are inclusive and fair, preventing time-wasting wordsmithing during the meetings, respecting ISO procedures etc. TS23635 has the potential to become the central reference for any blockchain-based alliance, coalition, or supply chain solution, that must define a governance regime for operating a DLT system.

Concerned ICT Standards and contribution to the related landscape

The work as convenor of ISO TC307 "blockchain and DLT systems" WG 5 to develop TS 23635 "Guidelines for Governance" has been completed. The standard is forthcoming and will be published beginning of February 2022, according to ISO. https://www.iso.org/standard/76480.html. As convenor and editor of TS 23635, I am moderating the standards development as it happens by correspondence as well as in real time. Always keeping the discussion alive in an in a broad and inclusive manner making sure it gravitates towards the qualitative process. A craft that also includes diplomacy on the path to international consensus. This requires timing and a well-orchestrated, balanced approach to the process of reaching mutual understanding between quite different but all very professional experts, eventually leading to an agreed upon document.

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

Impact on SMEs

Blockchain will affect all industries as well as society at large, including SMEs. To understand and navigate complexity in decentralised governance systems, TS 23635 also provides guidance to SMEs to familiarise with the possibilities, and challenges, of governance in DLT systems.

Impact on society

If the Internet is a standard for information exchange and communication, Blockchain is the standard for transactions and coordination. As the Internet had an impact on all parts of

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society, so will blockchain, enforcing business logics and new economic models cross-border, and cross-chain.

Has your project directly involved or led to a specific recommendation or proposal for the development of new or revised standards? Or was it aimed at supporting the development or revision of a standard already under development?

YES - I am convenor of a new TS 23635 Guidelines for Governance at ISO TC 307 Blockchain and DLT systems. This is a new TS that I have initiated as convenor and editor.

Has your fellowship contributed to the development of a new work group (WG) or a new technical committee (TC)?

YES - TC 307 /WG5 is a new working group that I (as convenor) have started.

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 standards in this field are very mature. However, continuation of actions is suggested. TS 23635 needs now to be tested by the market. As convenor, we will coordinate meetings with TC 307 WG5 in 2022 to promote the use of the standard as well as collecting feedback. At the end of 2022 / beginning of 2023, we will initiate an update on the standard, as the field is progressing, new aspects of decentralized governance need to be incorporated, and potential flaws in the document need to be revised.

Online references related to the fellowship work

⬇ https://www.iso.org/standard/76480.html

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■ Smart Contracts for Media

Panos Kudumakis
Chair ISO/IEC JTC1/SC29/WG03
Head of UK Delegation of ISO/IEC JTC1/SC29
United Kindgom

Sector

Blockchain and Distributed ledger technologies

Engaged SDOs, WGs and TCs

ISO/IEC JTC1/SC29/WG03 MPEG Systems subgroup on 'Smart Contracts for Media'. ISO/IEC 21000-23 Smart Contracts for Media

Addressed EU standardisation priorities and gaps

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

ISO/IEC 21000-23 Smart Contracts for Media will greatly assist the media stakeholders in achieving effective interoperability for the exchange of verified contractual data between different DLTs. Such a process in turn will increase trust among the stakeholders for sharing data (e.g., music rights) in the ecosystem. Another important feature of this standard is that it offers the possibility to bind the clauses of a smart contract with those of a narrative contract. In this way, each party signing an MPEG IPR smart contact will know exactly what the clauses of the smart contract express.

Concerned ICT Standards and contribution to the related landscape

In summary, the aim of this project is to enrich the blockchain environment with inference and reasoning capabilities inherently associated with ontologies. Thus, an MPEG Systems subgroup has been established on 'Smart Contracts for Media', chaired by the author, with the aim to develop the means (e.g., application programming interfaces) for converting MPEG IPR ontologies and schemas (ISO/IEC 21000-19 Media Value Chain Ontology, 21000-19/AMD1 Audio Value Chain Ontology, 21000-20 Contract Expression Language and 21000-21 Media Contract Ontology) to smart contracts that can be executed on existing blockchain environments.

The resulting standard, ISO/IEC 21000-23 Smart Contracts for Media, which has reached Final Draft International Standard stage, is envisaged to close the interoperability gap toward a semantic music and media blockchain. As such, it has the potential to unlock both the semantic web and in turn the creative economy and open the way forward for other industry domains.

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

Impact on SMEs

Effective IP rights management in the digital environment is key to support the competitiveness of creative industries. SMEs need to be empowered to make better decisions

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and deploy more advanced solutions based on insights gleaned from data. ISO/IEC 21000-23 Smart Contracts for Media supported by rich semantic copyright models can be handy when data-based decisions need to be derived by evidence and logic, leading to new business models that can be efficiently deployed on DLT media platforms.

Impact on society

Inference and reasoning capabilities normally associated with ontology use cannot naturally be done in a blockchain environment. Bridging this gap has the potential to unlock the semantic web and in turn the creative economy. The latter is not only one of the most rapidly growing sectors of the world economy, but also a highly transformative one in terms of income-generation, job creation, export earnings, quality of life and social cohesion. Recent studies have shown that the creative sector is contributing 4.4 % to the EU GDP, while providing quality jobs to 8.3 million people across EU27.

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

Has your project directly involved or led to a specific recommendation or proposal for the development of new or revised standards? Or was it aimed at supporting the development or revision of a standard already under development?

YES - This project led the development of ISO/IEC 21000-23 Smart Contracts for Media, reference software and conformance testing from Draft International Standard (DIS) to Final Draft International Standard (FDIS) stage. It completed the bidirectional conversion of MPEG-21 CEL/MCO contracts to smart contracts for a) CEL/MCO to Solidity/Ethereum, b) CEL to Michelson/Tezos, and c) MCO to Teal/Algorand. By doing this conversion in a standard way (thanks to blockchain agnostic API specification) for several smart contract languages it is going to ensure that ISO/IEC 21000-23 Smart Contracts for Media prevail as the interlingua for exchanging verified contractual data between different DLTs.

Has your fellowship contributed to the development of a new work group (WG) or a new technical committee (TC)?

YES - an MPEG Systems subgroup has been established on 'Smart Contracts for Media', chaired by the author, with the aim to develop the means (e.g., application programming interfaces) for converting MPEG IPR ontologies and schemas (ISO/IEC 21000-19 Media Value Chain Ontology, 21000-19/AMD1 Audio Value Chain Ontology, 21000-20 Contract Expression Language and 21000-21 Media Contract Ontology) to smart contracts that can be executed on existing blockchain environments.

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 standards in this sector are very mature. However, continuation of action is suggested. This project led the development of ISO/IEC 21000-23 Smart Contracts for Media standard from Draft International Standard (DIS) to Final Draft International Standard (FDIS) stage. ISO project schedule is given below:

▷ New project approved: 26 Jan. 2021
▷ Committee Draft registered: 2 Feb. 2021

- ▷ Draft International Standard registered: 8 Aug. 2021
- ▷ Final Draft International Standard registered: 27 Apr. 2022
- ▷ International Standard published: 11 Aug. 2022

It should be noted that MPEG project schedule is about 3-4 months earlier.

Whilst this standard is currently at mature stage of development (FDIS stage), an amendment on 'Smart Contracts for Media in ISOBMFF' would further benefit smart contract application developers. ISO Based Media File Format (ISOBMFF) is a Tech Emmy® Award (2021) winning standard. The focus will be on ISOBMFF widely deployed ISO/IEC 23000-23 Interactive Music Application Format (IM AF) and ISO/IEC 23000-19 Common Media Application Format (CMAF).

Online references related to the fellowship work

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

⬇ Public OpenAPI Specification: https://mpeg21-scm-openapi.herokuapp.com/docs/

⬇ Public Demonstration: https://scm.linkeddata.es/

⬇ ISO Store: https://www.iso.org/standard/82527.html

⬇ Specification by ISO: https://sd.iso.org/documents/open/4fcc9e3b-d370-4bf8-a0e2-2ea7e974aeb5

⬇ Specification by MPEG: https://dms.mpeg.expert/doc_end_user/documents/135_OnLine/wg11/MDS20571_WG03_N00317.zip

⬇ Reference Software by ISO Portal: https://standards.iso.org/iso-iec/21000/-23/ed-1/en/

⬇ Reference Software by MPEG Repository: https://mpeg.expert/software/MPEG/Systems/mpeg-21/smartcontracts/

Background

Panos Kudumakis, Thomas Wilmering, Mark Sandler, Víctor Rodríguez-Doncel, Laurent Boch, Jaime Delgado, 'The Challenge: From MPEG Intellectual Property Rights Ontologies to Smart Contracts and Blockchains', IEEE Signal Processing Magazine, pp. 89-95, 37(2), Mar. 2020. [Online]. Available: http://doi.org/10.1109/MSP.2019.2955207

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4.
SUSTAINABLE GROWTH
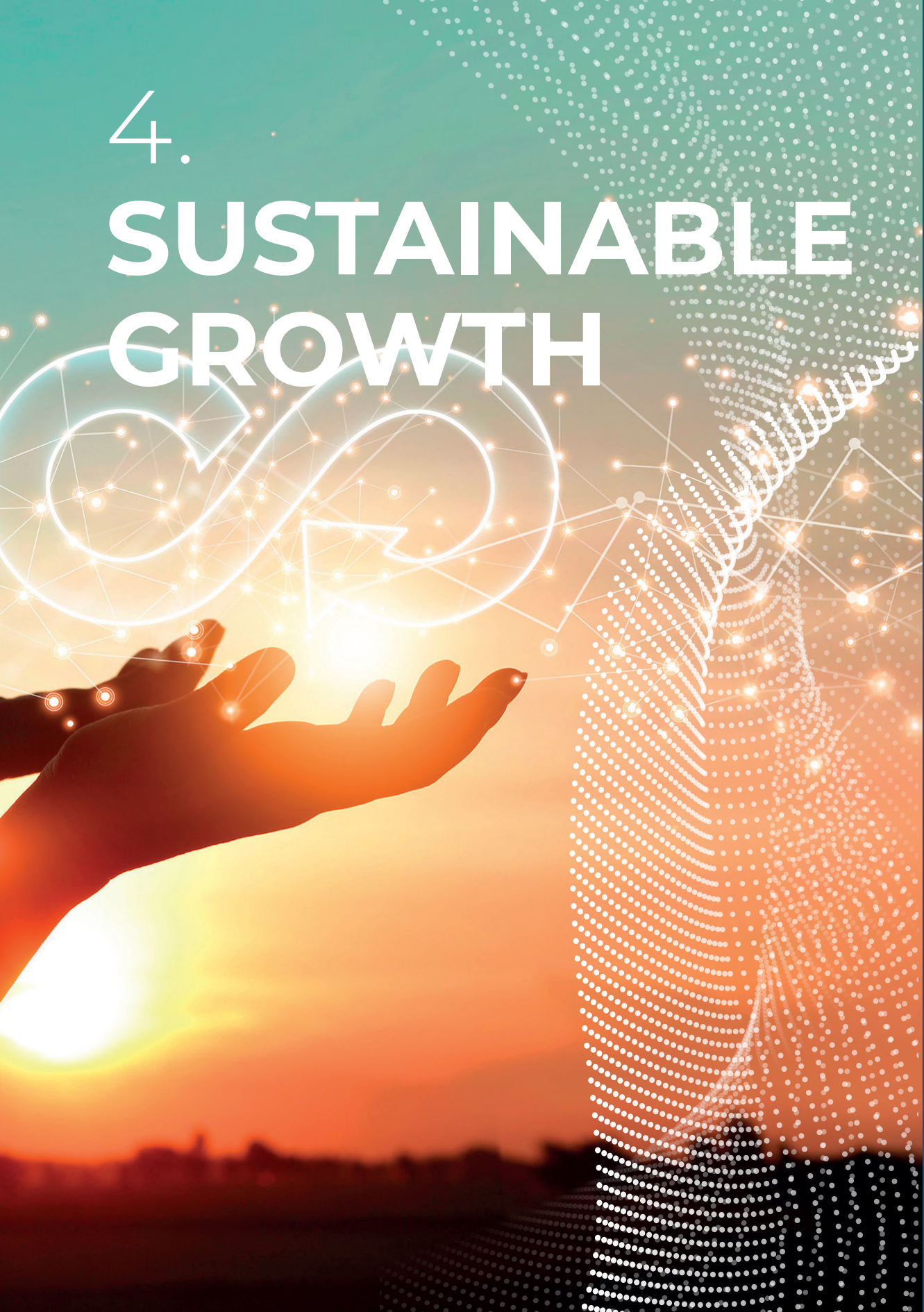
JSON Implementation Standard for Observations, Measurements and Samples
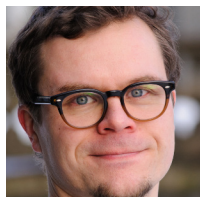
Ilkka Rinne

Co-Founder, Spatineo Inc.
Finland

Sector

Smart Cities

Engaged SDOs, WGs and TCs

Open Geospatial Consortium
ISO

OGC Observations and measurements Standards Working Group
ISO / TC 211 - ISO TC 211 / WG 9 / ISO 19156

Addressed EU standardisation priorities and gaps

In domains such as Smart Cities sensor-created, near real-time data flows about various aspects of the built and natural environment needs to be quickly and reliably collected and analysed to feed autonomous and human-guided decision making.

The new OGC Standard for JSON based encoding of observations, measurements and samples addresses the gap of lacking technical interoperability between information systems exchanging observation and measurement data by providing a clear set of requirements and recommendations that are straightforward to apply in modern, Web-based applications.

Top priority for the OMS JSON implementation is reaching a consensus on the right level of standardization and use cases for applying the new standard. Data APIs different domains and applications will be granted to vary and develop in time, and the key is to come up with a specification that both solves concrete interoperability issues and stays technically relevant for more than a few years.

Concerned ICT Standards and contribution to the related landscape

The OMS JSON implementation standard defines JSON encodings of the abstract Observations, measurements and samples (OMS) concepts (ISO 19156 / OGC Abstract Specification Topic 20). The OMS standard has been completely revised and modernised in 2019-2021, and was submitted to the ISO for to become published as Draft International Standard in November 2021. The OGC OMS JSON Implementation Standard will provide common base for exchanging JSON based OMS data between various information systems and modern web APIs, such as OGC SensorThings API and OGC API - Features. Moreover, the JSON Implementation Standard for Observations, Measurements and Samples provides a valuable use case for the standardisation of location-enabled JSON encodings within the OGC, drafted in parallel in the OGC Features and Geometries Standards Working Group.

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

Impact on SMEs

Directly, my contribution affects the expertise and visibility of my company, Spatineo, which is a European SME grounded firmly in applying technical standards to solve customer interoperability challenges. Indirectly the OMS JSON creates new possibilities for a wide range of European SMEs to collect and analyse various environmental sensor data in both urban and natural environments, and provide novel software applications leveraging that data.

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Impact on society

The Observations, Measurements and Samples (OMS) family of standards enable cross-organisation and cross-domain observation and sample act and result data exchange with well-known semantics, standardised data structures and contents. This has great potential for societies, enterprises and individuals via added ease of use and analysis capabilities aggregation, processing and analytics of sensor data from various sources.

Has your project directly involved or led to a specific recommendation or proposal for the development of new or revised standards? Or was it aimed at supporting the development or revision of a standard already under development?

YES – The project's aim is the create a new OGC Implementation Standard for OMS JSON; Additionally, the ISO and OGC standards describing the conceptual and logical OMS data models were completed.

With the support of the StandICT.eu 2023 grant in 2021 and previous StandICT.eu program grant in 2019, the ISO Technical Committee 211 working group lead me has been able to draft and submit a complete revision of the ISO 19156 - Observations, measurements and samples (OMS) standard for Draft International Standard ballot in ISO. The final International Standard is expected in June 2022. The same document is also submitted to be published by the OGC Observation and measurements Standards Working Group (O&M SWG) as a revision of the OGC Abstract Specification Topic 20 - Observations, Measurements and Samples Standard.

Has your fellowship contributed to the development of a new work group (WG) or a new technical committee (TC)?

NO

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

YES – Technical specifications. OGC Abstract Specification Topic 20 - Observations, Measurements and Samples (about to start Technical Committee approval vote within OGC).

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

The OMS Abstract Specification is currently in the publication chain in both ISO and OGC. Many of the technical issues in implementing the OMS JSON encoding have been solved during the grant period, but the OMS JSON implementation still needs further investigation and research on its practical use cases and application environments, in order to support them in the most effectively. Only after this end-user participation and evaluation, it makes sense to fix the encoding decisions as a standard. This work continues within the OGC O&M SWG in 2022.

Online references related to the fellowship work

Initial OMS GeoJSON specification drafting workspace:

https://github.com/opengeospatial/om-swg/wiki/OMS-GeoJSON-drafting

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Leading the development of ITU standards for IoT applications in smart cities and communities

Marios Angelopoulos

Associate Professor in Computing at Bournemouth University United Kingdom

Sector

Smart cities

Engaged SDOs, WGs and TCs

ITU-T Study Group 20

Addressed EU standardisation priorities and gaps

My work in ITU addresses the priorities of the call pertaining to smart cities and communities/ technologies and services for smart and efficient energy use, and citizen centric digital public services and EMC radiation. The work is highly relevant to the European Commission's strategy for Europe as the development of standards provisioning the use of crowdsourcing methodologies is aligned with one of the nine initiatives mentioned in a recent report by the European Commission DG Communications Networks, Content & Technology to lead the way is 'empowering cities and communities across Europe' through 'better public services for citizens, better use of resources and less impact on the environment'. Furthermore, crowdsourcing methods enable the re-purposing of privately own digital assets (such as smartphones) and therefore in line with sustainability and the transition to a Circular Economy as described in the Green Deal.

Concerned ICT Standards and contribution to the related landscape

My fellowship supports my engagement and contribution to the International Standardisation Union (ITU), one of the most prominent and prestigious SDOs in the area of ICT with a global outreach to policy makers, Industry and Academia. In particular, the fellowship supports me in my role as Associate Rapporteur of Question 5 "Study of emerging digital technologies, terminology and definitions" in ITU-T Study Group 20 "Internet of Things, smart cities and communities" and as Liaison co-Rapporteur of Study Group 20 to the Standardization Committee for Vocabulary (SCV). Currently SG20/Q5 has five active work items covering areas such as blockchain terms and definitions for IoT, digital transformation, and smart oceans. Furthermore, I also lead the editorship of a work item for ITU Technical Report YSTR.P2P-CC "Current state of P2P crowd charging platforms and corresponding market needs".

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

Impact on SMEs

According to Allied Market Research, the Wireless Power Transfer market is projected to be worth USD 35 Billion by 2030 at a 27 CAGR. The development of international standards will help provide SMEs, policy makers and regulators with common references thus helping overcome market barriers such as technology fragmentation, thus promoting market growth.

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Impact on society

In the context of my fellowship, I lead the proposal and subsequent establishment of a new work item on P2P crowd-charging; a paradigm of crowdsourced systems where privately owned digital assets (such as smartphones) are re-purposed, therefore contributing to sustainability and the transition to a Circular Economy as described in the Green Deal. Furthermore, the new work item will identify and outline corresponding market needs with the aim of underpinning the establishment of a normative ITU-T Recommendation. This activity will therefore support growth in the corresponding market opening commercialisation pathways, while at the same time promoting EU initiatives and strategic objectives on sustainability, better public services for citizens, better use of resources and less impact on the environment.

Has your project directly involved or led to a specific recommendation or proposal for the development of new or revised standards? Or was it aimed at supporting the development or revision of a standard already under development?

YES - This fellowship has been successful in establishing the new work item ITU-T YSTR.P2P-CC.

Has your fellowship contributed to the development of a new work group (WG) or a new technical committee (TC)?

NO

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

YES- Technical report (development of new standards)

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

The standards in this field are in preliminary phase. Therefore, continuation of action is suggested. The typical timescale for work items to be concluded in ITU is around two years (time period from the establishment of a work item until the publication of its outcome). This fellowship has been successful in establishing a new work item in an area that is highly relevant to the European strategic agenda. As such, continual support of this activity is suggested in order to attain successful fruition.

Online references related to the fellowship work

Link with SG20 list of Questions and Rapporteurs:
https://www.itu.int/net4/ITU-T/lists/loqr.aspx?Group=20&Period=16

Link with active Q5/20 work items:
https://www.itu.int/ITU-T/workprog/wp_search.aspx?sg=20&q=5

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Convenorship of CEN/TC278 WG4 and ISO/TC204 WG10 and Expert to CEN/TC278 WG17 and ISO/TC204 WG19

Paul Burton
Independent ITS professional
United Kingdom

Sector

Intelligent Transport System

Engaged SDOs, WGs and TCs

BSI
ITU
IEC TC 57 WG 15
CEN/TC278 WG4 - CEN/TC278 WG 17
ISO/TC204 WG3 and WG19 - ISO/TC204 WG10

Addressed EU standardisation priorities and gaps

This activity allows a significant contribution to the work as the Convenor of CEN/TC278 WG4 and ISO/TC204 WG10 and Expert to CEN/TC278 WG17 and ISO/TC204 WG19. This will ensure better standards in a reduced timescale. Progression of the standards in these Working Groups will contribute to the swifter development of the standards for Electromobility and CCAM. In an area of worldwide rapid developments Europe is a leading player and development of standards and supporting standards will help to that advanced position. The continued adoption of ITS in the European Union will also help the environment by the modal shift from private vehicles to public transport and the shift from carbon-based fuels to more environmental-friendly alternatives.

Most importantly standards in this area will ensure compatibility and interoperability in an environment when big players seek to impose their platform dependant solutions which do not allow interoperability.

Concerned ICT Standards and contribution to the related landscape

This activity provided resources to convene and execute meetings as well as contributing technically to the work of:

▷ CEN/TC278 WG4 and ISO/TC204 WG10 and Expert to CEN/TC278 WG17 and ISO/TC204 WG19.
▷ EN ISO 14819:2021 - series (RDS-TMC) is not only in widespread use worldwide but the message sets and location referencing methodologies contained within them support advanced systems like CCAM and Electromobility.
▷ ISO 21219 - series (TPEG2) which is a Traveller and Traffic Information similarly support advanced ITS. The message-set schemas and location referencing methodologies contained within them are already incorporated in Cooperative ITS.
▷ Most importantly, ISO 14823 (ITS - Graphic Data Dictionary) which is a way of cataloguing street signs with a unique structured message number.
▷ Management of Electronic Traffic Regulation (METR) projects.

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

Impact on SMEs

The agreement of standards allows SME to compete on a level footing with large organisations which seek to impose their non-interoperable solutions on the marketplace. Standards assist the niche small organisations to make a positive impact in the marketplace.

Impact on society

In addition, the project contributes to the following impacts:

1. Reduction of global warming by:
   ▷ More efficient routing thereby reducing Congestion.
   ▷ Avoidance of Congestion.
   ▷ Encouraging modal shift to more efficient transport thereby reducing emissions.
   ▷ Encouragement and support of a shift to less environmentally damaging vehicles (electric).
2. Reduction of death and serious injury by driver assistance measures

Has your project directly involved or led to a specific recommendation or proposal for the development of new or revised standards? Or was it aimed at supporting the development or revision of a standard already under development?

YES - EN ISO 14823-1 Edition 2 Intelligent transport systems-Graphic Data Dictionary has been sent for CD ballot and will be submitted for DIS ballot in December 2021. 11 parts of ISO 21219 have been or are in the process of revision or publication as full International Standards.

Has your fellowship contributed to the development of a new work group (WG) or a new technical committee (TC)?

NO

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

YES – Technical specifications, Technical report (common terminology), Technical report (Development of new standard), Technical report (Reference data), Technical report (Reference material). DIS 14819-1: Edition 2 Intelligent transport systems - Graphic data dictionary - part 1: Specification ISO/TS 21219-series (20+ parts) TPEG2 for revision and publication.

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

The standards are mature; however, I suggest continuation of actions. The work will need to continue, plus the identification of a European expert to continue as convenor and expert in this area, due to the impending retirement of the present convenor.

Online references related to the fellowship work

⬇ https://www.itsstandards.eu

⬇ https://www.iso.org/committee/54706.html#:~:text=ISO%20%2F%20TC%20204%20
   is%20responsible%20for%20the,account%20the%20work%20of%20existing%20
   international%20standardization%20bodies

⬇ https://tisa.org

■ Request for funding for IETF IoT work

Maria Ines Robles
IETF Working Group Chair, System Information Engineer,
Tampere University. Finland

Sector

Digitisation of European Industry

Engaged SDOs, WGs and TCs

IETF
IETF ROLL (Routing Over Lower Power and Lossy Networks) working group.
IETF Internet of Things Directorate.
IETF General Area Review Team.
IETF Routing Directorate.

Addressed EU standardisation priorities and gaps

One of the challenges in industrial plants in Europe is to ensure seamless connectivity and interoperability throughout ever increasing number of wirelessly connected devices. One of the protocols developed to address these challenges is RPL(RFC6550), the IoT-routing protocol, with features such as self-healing capabilities. The aim of ROLL is to improve the routing in constrained environments. This broadens the range of use cases where IoT can be applied to business needs of the European smart industry and societal application such as smart cities. The technical work is addressing the following gaps: Supporting Asymmetric Links; RPL Capabilities; RPL Initiated routing; Controlling Secure Network Enrollment; Operation Mode extension; Common Ancestor Objective Function and Parent Set DAG Metric Container Extension; Fast border router crash detection. Also, the IoT directorate establish communication, dissemination reach across the organizations not fully aware of the IoT work at IETF.

Concerned ICT Standards and contribution to the related landscape

The IETF develops Internet protocols deployed worldwide, I am co-chairing ROLL (Routing Over Low-power and Lossy Networks) IETF working group (WG) that develops protocols for routing related to Internet of Things used in use cases such as Industry 4.0, smart health and smart cities. The WG focus on routing issues improving the protocols already developed (RPL, MPL, routing security, etc). The project helps to achieve the milestones and objectives by the WG. Additionally, I am co-chairing the IETF IoT Directorate, which is an advisory group of experts that coordinates the IETF IoT groups increasing visibility to e.g. external SDOs. The project helps to collaborate with other SDOs on the IETF IoT work and disseminate the work and support the overall coordination of the protocol groups at large. Also, my activity as reviewer in the Routing Directorate and reviewer in the Gen-Area Review Team helps to improve the quality of the IETF standards.

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

Impact on SMEs

The IETF RPL is an approved open international standard with various implementations available as open source, evaluated through extensive simulations, and it is in continuous testing. RPL deployments meets all the capabilities required by European SMEs to grow

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in a sustainable way. Thus, the continuous improvement that is taking place in ROLL is essential to guarantee the adaptation of new use cases covered in Europe, allowing inherent interoperability and security required in SMEs.

Impact on society

The IETF IoT Routing protocols broaden the range of use cases where IoT can be applied to needs of the European societal applications such as smart cities, smart grid, smart workforce and smart health in order to address the challenges to ensure seamless connectivity, security, safety and interoperability throughout ever increasing number of wirelessly connected IoT devices that are improving and streamlining our lives.

Has your project directly involved or led to a specific recommendation or proposal for the development of new or revised standards? Or was it aimed at supporting the development or revision of a standard already under development?

YES

▷ The chairing of ROLL (Routing Over Low Power and Lossy Networks) at the IETF led to the development of the following standard work:

▷ Supporting Asymmetric Links in Low Power Networks: AODV-RPL (Document in progress proposed as Standard Track).

▷ RPL Capabilities (Document in progress proposed as Standard Track).

▷ Root initiated routing state in RPL (Document in progress proposed as Standard Track).

▷ Controlling Secure Network Enrolment in RPL networks (Document in progress proposed as Standard Track).

▷ Mode of Operation extension (Document in progress proposed as Standard Track).

▷ Common Ancestor Objective Function and Parent Set DAG Metric Container Extension (Document in progress proposed as Standard Track).

Has your fellowship contributed to the development of a new work group (WG) or a new technical committee (TC)?

NO

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

YES – Technical report: The co-chairing activities of IETF ROLL and IETF directorates activities led to: - Report of ROLL meetings. - Report of the IETF IoT directorate meetings. - Report of the reviews done for the IETF Routing Directorate. - Report of the reviews done for the IETF gen-area work.

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

The standards in this field are mature. However, continuation of actions is suggested. The IETF ROLL working group continues working in routing issues for constrained (IoT) environments which are constantly adapted to the needs of the Internet users that are currently being under served due to remote locations, hard to reach areas with limited infrastructure or harsh environment use cases. The IETF IoT Directorate continues the coordination of the IoT work within the IETF and the interactions with other SDOs. Reviews of proposed standards in the area of routing and general Internet documents continue as the evolution of Internet is advanced by the development of new standards.

Online references related to the fellowship work

ROLL Co-chair work: IETF ROLL Mailing List: e.g. organizing the IETF 112 ROLL meeting

⏬ https://mailarchive.ietf.org/arch/msg/roll/tVoayGKJao9FWi1WCTOa_qTrUvM/

IoT Directorate co-chair work: e.g. Discussion on Joint Workshop of IIC with IETF

⏬ https://mailarchive.ietf.org/arch/msg/iot-directorate/B0YznYu1j09Z3clRfR6hB0sUdu0/

Github:

⏬ https://github.com/iot-dir/Meetings

Gen-art review:

⏬ https://datatracker.ietf.org/doc/review-ietf-httpbis-priority-10-genart-lc-robles-2021-11-29/

⏬ https://datatracker.ietf.org/doc/review-ietf-tsvwg-rfc4960-bis-15-genart-lc-robles-2021-10-14/

Routing directorate review:

⏬ https://datatracker.ietf.org/doc/review-ietf-idr-bgp-open-policy-18-rtgdir-lc-robles-2021-12-08/

⏬ https://datatracker.ietf.org/doc/review-ietf-teas-gmpls-signaling-smp-07-rtgdir-lc-robles-2021-10-08/

⏬ https://datatracker.ietf.org/doc/review-ietf-bier-te-arch-10-rtgdir-telechat-robles-2021-08-24/

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Parson + iiRDS, Working Group participation and Maintenance Domain extension

Mark Schubert
Member of the Working Group Development of the iiRDS Consortium
Technical consultant at Parson AG
Germany

Sector

Digitisation of European Industry

Engaged SDOs, WGs and TCs

iiRDS | **iiRDS**

Addressed EU standardisation priorities and gaps

iiRDS is aligning with other standardisation initiatives. For example, an iiRDS taskforce is working on ECLASS and the iiRDS Steering Committee on Industry 4.0 alignment. None of these activities addresses alignment on ontology level. This funding allows to fill this gap and align the iiRDS metadata model with existing European ontology initiatives.

Within the industry, iiRDS finds use in existing projects. But integrating iiRDS data with other knowledge graphs is done on company level and based on proprietary implementations and interpretations of iiRDS and other standards. This project sets a foundation by aligning iiRDS with OntoCommons and existing top-level ontologies. Having a common ground would greatly improve data integration within the iiRDS use cases and open up iiRDS to other European ontologies.

The main challenge is a lack of knowledge within the iiRDS consortium regarding top-level ontologies which hamper the ability to assess pros and cons of such an alignment.

Concerned ICT Standards and contribution to the related landscape

The funding contributed to the extension of my activities for the iiRDS consortium and allowed me to participate in OntoCommons workshops. The following tasks were covered:

iiRDS Working Group Development
- ▷ Schedule and moderate monthly iiRDS WG Development meetings.
- ▷ Participate in monthly iiRDS WG Tools meetings.
- ▷ Research impact of top-level ontology alignment for iiRDS and define work packages.
- ▷ File and update work packages in the iiRDS task tracker JIRA.
- ▷ Draft an iiRDS maintenance domain based on maintenance information in S1000D.
- ▷ Research existing maintenance ontologies that might complement or substitute the draft iiRDS maintenance domain.
- ▷ Present OntoCommons activities in the working groups and at the iiRDS Annual Meeting.

Coordination with OntoCommons
- ▷ Alignment with OntoCommons regarding their plans for top-level ontologies.

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- ▷ Participate in OntoCommons workshops.
- ▷ Research of top-level ontologies and other maintenance initiatives, e.g., IOF maintenance working group.

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

Impact on SMEs

I participated in discussions in OntoCommons workshops to gain better understanding of other initiatives and to promote requirements of the domain of technical communication. Within the activities of iiRDS, I report findings of the research conducted within this project and discuss its potential impact on iiRDS. RDF/OWL proposals were prepared and presented to the working groups. I also presented iiRDS to interested companies and individuals that request information from the iiRDS consortium.

Impact on society

My work is aiming to improve a standard for the exchange of technical documentation. It benefits manufacturers, buyers, and consumers of goods alike and improves the exchange of information related to these goods. Evaluating the societal impact of an improved exchange of information accompanying economic transactions is not in scope of this project.

Has your project directly involved or led to a specific recommendation or proposal for the development of new or revised standards? Or was it aimed at supporting the development or revision of a standard already under development?

YES - The work of this Fellowship project resulted in multiple proposed changes to iiRDS. The proposals cover the topics mentioned above, OntoCommons alignment, implementation of FAIR principles, and adding of a maintenance domain.

Has your fellowship contributed to the development of a new work group (WG) or a new technical committee (TC)?

NO

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

YES – Technical report: Change requests and draft proposals.

I started to file change requests in the iiRDS ticket tracker and presented them to the WG Development. I've also provided input to existing change requests, for example about maintenance ontologies and IOF activities. This projects aim is evaluating the required changes and estimate the effort for OntoCommons alignment and implementation of FAIR principles.

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

The standard itself is mature and in use in several projects, implemented by developing companies in their products (content management systems and content delivery portals). The deliverables of this Fellowship Project are in a preliminary phase. Finalisation is planned for the StandICT.eu 4th Open Call. Ongoing improvement of iiRDS is a balance act between stability which is expected of a standard and support of new use cases. StandICT.eu 4th Call will continue the work started during this Fellowship Project. The work conducted during this project has raised awareness of the potential of an alignment of iiRDS with other European standards within the iiRDS consortium's members. After implementation the acceptance should be increased by supporting activities such as talks on conferences and support activities by the iiRDS consortium.

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Online references related to the fellowship work

The standard is available after registration under the following address:

🔽 https://iirds.org/

It is also available on GitHub under the following address:

🔽 https://github.com/iirds-consortium

And due to 2.16.3 also available in:

🔽 https://service.tib.eu/ts4tib/ontologies/ico

🔽 https://service.tib.eu/ts4tib/ontologies/imo

🔽 https://service.tib.eu/ts4tib/ontologies/iso

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Development of content delivery standard for smart content, iiRDS

Ulrike Parson
Chair of the Steering Committee of the iiRDS Consortium
Parson AG
Germany

Sector

Digitisation of European Industry

Engaged SDOs, WGs and TCs

iiRDS | **iiRDS Steering Committee - iiRDS working group Development**

Addressed EU standardisation priorities and gaps

iRDS is constantly aligned with other standardisation initiatives to achieve interoperability and to support IIoT 4.0 scenarios. For this purpose, the iiRDS consortium has founded task force and working groups:

▷ Sub-working group for the alignment of ECLASS and iiRDS. With the connection of these standards, product data can be linked to technical communication content, e.g. operating or service instructions.

▷ Alignment on steering-committee level with Industry 4.0 Platform: The Industry 4.0 Platform is working on the standardisation of the asset administration shell, a standardised digital description of each asset in an industry 4.0 scenario. The iiRDS consortium is planning a project for the development of an asset administration shell for iiRDS data, which will enable delivering smart content in a standardised way.

▷ Further development of iiRDS regarding the planned OntoCommons reference architecture for industry ontologies

Concerned ICT Standards and contribution to the related landscape

The funding contributed to the extension of my activities for the iiRDS consortium and allowed me to participate in OntoCommons workshops. The following tasks were covered:

▷ iiRDS Steering Committee work:
   ▷ Moderation of iiRDS Steering Committee meetings.
   ▷ Define and monitor strategic and operative goals for the iiRDS consortium.
   ▷ Align iiRDS with other standardisation initiatives, e.g. Platform Industry 4.0, ECLASS, IDiS (DKE and VDE working group for smart standards).
   ▷ Align SC and with iiRDS working group "Development".
   ▷ Conference contributions and publications about iiRDS.
   ▷ Present OntoCommons activities for iiRDS members.

▷ Coordination with OntoCommons
   ▷ Contribute to demonstrators.
   ▷ Represent iiRDS consortium in workshops and webinars.

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- ▷ Participate in the StandICT.eu EUOS TWG Ontologies.
- ▷ Research in order to define requirements for aligning iiRDS with the OntoCommons reference architecture.

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

Impact on SMEs

- ▷ I have been engaged in OntoCommons discussions and workshops in order to actively discuss ontology development and the digitalisation of standards.
- ▷ Within iiRDS, I report findings of the OntoCommons research and contribute to the IDiS initiative for smart standards.
- ▷ As iiRDS SC chair, I am supporting the demonstrator for intelligent content that Siemens contributes to Ontocommons, see https://ontocommons.eu/ontocommons-demonstrators.

Impact on society

iiRDS supports the exchange of technical communication across manufacturers and the delivery of information in order to support people in their daily working tasks. This benefits both manufacturers and users of technical products and services. Evaluating the societal impact of an improved exchange of information accompanying economic transactions is not in scope of this project.

Has your project directly involved or led to a specific recommendation or proposal for the development of new or revised standards? Or was it aimed at supporting the development or revision of a standard already under development?

YES - Further development of iiRDS.

Has your fellowship contributed to the development of a new work group (WG) or a new technical committee (TC)?

NO

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

YES - Change requests for iiRDS, Siemens demonstrator proposal for Ontocommons.

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

The standard itself is mature and in use in several projects, implemented by developing companies in their products (content management systems and content delivery portals). However, maintenance and extension of the iiRDS standard is an ongoing process. Maintenance, further development of iiRDS and an alignment of iiRDS with the Ontocommons ecosystem as well as other standardization initiatives remain important and will be continued. iiRDS is in use in several projects, implemented by suppliers of content management and content delivery systems. From these activities and projects, new requirements arise that need to be implemented. Also, the iiRDS consortium will continue to spread knowledge about the standard and support implementation projects.

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Online references related to the fellowship work

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🔽 https://iirds.org/

It is also available on github under the following address:

🔽 https://github.com/iirds-consortium

The results of the IDiS working group have not been published yet. Alignment with ECLASS is ongoing. Work on the Siemens demonstrator for Ontocommons is in progress; the results will be published via Ontocommons.

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QuaFair: Data quality assessment thorugh Contextual Intelligence using the FAIR data methodology

Antonio Jara

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Sector

Digitisation of European Industry

Engaged SDOs, WGs and TCs

◆ **IEEE**

ETSI
World Class Standards

IEEE Industrial Committee
ETSI NGSI-LD & ETSI SAREF
IEEE P2510
OMA Technical Group

Addressed EU standardisation priorities and gaps

▷ Data Quality assessment
▷ Data quality information integration into smart data models (FIWARE)
▷ Data interoperability

Concerned ICT Standards and contribution to the related landscape

IEEE P2510 and data quality standard has elaborated a Technical Architectural for Intelligent Interaction to generate, store and interact between "Sensor Vendors", "Certificate Authorities", "IEEE Databases" and "Final Customers". Thereby, it is also able to be integrated with the emerging DIHs, IEEE PAR2510 is defining the organisational structure to certify and validate sensors quality.

Help with working with multiple brands, sensor types, models and prices, where a customer may not know about the quality of the data that sensors will generate. The IEEE P2510 standard has integrated metadata as Digital Logic Unit (DLU) into the smart data models and other standards.

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

Impact on SMEs

IEEE P2510 enable the creation of a database with the details of accuracy and calibration from key IoT Devices for its industry purpose. Therefore:

▷ Offering to SMEs and sensors manufacturers as part of the certification process.
▷ Offering to industries support to choose the right sensors based on their industrial needs.

Impact on society

In addition, the fellowship contributed to the generation of value around interoperability, data sovereignty, data quality and empowering industries to validate and valorise quality.

Has your project directly involved or led to a specific recommendation or proposal for the development of new or revised standards? Or was it aimed at supporting the development or revision of a standard already under development?

YES - IEEE P2510

Has your fellowship contributed to the development of a new work group (WG) or a new technical committee (TC)?

YES – It contributed to create the IEEE P2510 Technical Committee.

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 standards are in preliminary phase; therefore, continuation of actions with the IEEE P2510 standard, promotion to DIHs and generation of additional documents is suggested.

Online references related to the fellowship work

https://ieee-sensors.org/industry-liaisons/

https://standards.ieee.org/project/2510.html

https://smartdatamodels.org/

https://iot-scla.org/keynote-speakers/

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