

5G International Standardisation efforts from EU experts: Insights from StandICT 2023 funded fellows

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Abstract: *This paper explores the contributions to European and global 5G standardisation, drawing from the StandICT.eu 2023 project. The analysis focuses on insights from the “fellows” of the StandICT.eu 2023 project, examining how these efforts have influenced the development and integration of 5G technologies, highlighting the key role of interoperability in promoting technological harmony and maximising the societal and economic benefits of these innovations.*

1. Introduction

This paper aims to provide a bird’s eye view of the contribution to European and global 5G standardisation efforts coming from the European ICT Standardisation community, drawing from insights produced by the StandICT 2023 project, concluded in August 2023 and continuing with a follow-up initiative.¹ As telecommunications technologies evolve, new use cases are emerging that have the potential to transform into groundbreaking industrial applications, provided that interoperability is supported. However, these modern applications present challenges in managing complex technological demands, contributing to tangible societal improvements, and aligning with policy objectives. Key challenges include ensuring the sustainability and security of contemporary networks and enabling effective automation. The complexity of these applications has surpassed human capacity for direct management, necessitating sophisticated automated tools (Fourati et al. 2021, 2022; Salameh et al. 2022). In this context, it is crucial to underline the importance of standardisation as a backbone to ensure interoperability and technological harmony across various industries so that emerging applications can be better integrated into existing frameworks and maximise their societal and economic impact.

Initiatives like StandICT.eu recognise the pivotal role of standardisation. This EU-funded coordination and support action has distributed over 3 million euros since its inception in 2018 to support European participation in global Standards Development Organisations (SDOs) across various ICT fields. In its second edition, which concluded in 2023, the project specifically supported 14 experts working in the 5G domain who reported about the outcomes of their activities in standardisation. More aggregate statistics on the impact of the financial support provided by StandICT.eu to European standards experts, both in 5G and other ICT fields, are periodically shared with relevant Directorates of the European Commission and members of the Multi-Stakeholder Platform (MSP) to ensure that the major findings were included in the forthcoming ICT Rolling Plan for Standardisation.²

However, this paper specifically focuses on collecting insights from the 5G-related reports submitted to StandICT.eu by such funded experts, named “fellows.” As the StandICT 2023

¹ The website of the StandICT.eu project, now in its third edition (StandICT 2026), is available at: <https://www.standict.eu/>

² Learn more at <https://digital-strategy.ec.europa.eu/en/policies/rolling-plan-ict-standardisation>

project successfully ended in 2023, conclusions can be drawn on how the EU’s standardisation strategy has contributed to formulating and consolidating standards in the context of critical communication technologies such as 5G applications.

2. Methodology

StandICT.eu’s main goal is to strengthen its global reach in the European ICT Standardisation Ecosystem through a series of tools and actions. One of the most prominent ones is the launch and management of an open call system to distribute cascade funding to ICT standards experts. Over the 36 months of its lifetime, StandICT.eu 2023 has launched 9 Open Calls. Applications to each open call are evaluated by a pool of experts, independent from the StandICT.eu consortium, who produce an individual evaluation report and, jointly, a consensus report where all the evaluations (three per application) are compared and discussed. A fourth member of the pool of evaluators then acts as a quality controller over the formal procedures and consistency of evaluations. This system leads to funding a set of applications, which are considered successful and turned into fellowships of a maximum duration of 6 months. The funded fellows can then reapply to subsequent calls to continue receiving support for their work. The financial support is granted provided that the fellows submit an intermediate and/or a final report on the results and impact of their activities. The reports are collected digitally in the same platform used to manage the applications. The results discussed here are based on the analysis of the 24 successfully funded applications and the final impact reports submitted by the fellows contributing to 5G-related standards Technical Committees and Working Groups.

3. Key policy areas

Drawing from the main policy areas outlined in the EC rolling plan for ICT standardisation, proposals were divided according to the main policy area addressed by each one of them.

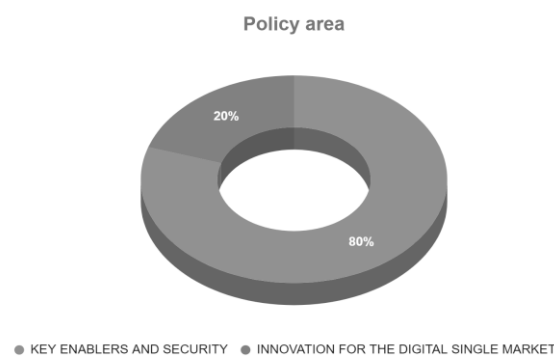


Figure 1: Key policy areas

Predictably, in terms of policy area, most contributions refer to “Key Enablers and Security”, which is unsurprising considering the centrality of 5G EU-wide deployment for the overall goal of digitising European industry and communication. To a minor extent, proposals also address innovation for innovation for the digital single market, with particular emphasis on blockchain and secure invoicing. While these indicators only provide a broad picture of the main societal and technological gaps addressed by different proposals, a qualitative analysis of the reports

allows for more specific insights into the main domains addressed and improvements. The main topics addressed by funded fellows include:

AI for 5G: development of standards for operationally autonomous and intelligent networks through the introduction of software components based on Artificial Intelligence (AI) Algorithms.

Automation for 5G: development of standards recommendations to enable the autonomous operation of telephone networks, addressing the challenge of scalability in human involvement to design and apply machine-learning technologies. Such applications would allow autonomous operation in the network, creating an interoperable ecosystem of technologies.

5G and power-sensitive devices: development of technical specifications to incorporate the low-power wake-up signal into 5G networks to enable use cases in advanced manufacturing and Industry 4.0, deploying 5G-connected battery-powered sensors and actuators in environments where a power supply is unavailable or impractical to install. This includes, for instance, 1) IoT devices collecting information and improving the everyday life of citizens (e.g., water, quality, smart cities, improved management of power and energy, etc.); 2) connected medical equipment to allow for remote monitoring of health data; 3) low-power devices for emergency communications.

5G and Beyond APIs for testbed federations:

- Standards development is used to validate open networking testbeds via federated standardised open platforms (Standards-driven open networking platforms, ONPs) for industrial purposes. An ONP is meant to be a “Neutral Environment”, i.e., an open platform that enables testing certain targeted standards, fusions and use cases.
- Leverage autonomics and foster collaboration among ICT ecosystems to enable stronger use cases and scenarios addressing current societal challenges.

Security in 5G networks:

- Development of standards to address security challenges implementing solutions for self-protection and self-defence autonomic behaviours by 5G networks and their associated management and control systems without the need for human operator involvement.
- Integration of blockchain technology and AI for radio access network (RAN) management automation to enable autonomous networking and enhance security in network operations.

4. Standards maturity and contributions

As of the maturity of the standards landscape addressed by these topics, over 50% of the proposals pertain to considerably mature standards, reflecting a push towards creating interoperable solutions that meet existing industry needs. This momentum is particularly evident in core areas such as Standards-Driven Open Networking Platforms across multiple SDOs for 5G and beyond, federated ICT value chains, and secure 5G infrastructure. This trend highlights the industry’s commitment to evolving and solidifying frameworks that support advanced, secure telecommunications networks.

Over 10% of submissions are primarily focused on advancing mature standards, particularly in the realm of AI-enabled autonomous networks. This underscores a commitment to enhancing

collaboration among experts, aiming to develop a unified framework for the integration and optimisation of AI capabilities within autonomous networking systems, facilitating more cohesive and efficient standards development. Funding additions to mature standards ensures continuous improvement, broader adoption, and sustained innovation, while also supporting the evolution and upgrade of technology from mature areas like 5G to emerging fields like 6G. In about 35% of instances, the required standards are still in the early stages of development. This is evident from the efforts of fellows who are actively involved in initiating work items to refine and establish standardised methods, mostly related to autonomous networks, low-power signal technology, and autonomous networking strategies.

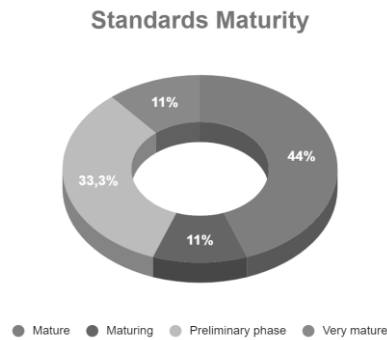


Figure 2: Standards maturity

The overall maturity of the standards landscape is also evident in the outcomes achieved by funded fellows. In 85% of cases, their applications have led to producing reports that offer specific recommendations for developing new standards. These reports include deliverables like technical reports and technical specifications outlining frameworks for various applications, including industry guides, federated testbeds, and blockchain-enabled autonomous networks.

5. Conclusions

This paper provides a preliminary overview of contributions to European and global 5G standardisation, laying the groundwork for further enrichment with StandICT 2026 data, including advancements into 6G and broader ICT sectors. Future analyses will draw deeper comparisons across technological domains and explore the evolving maturity of standardisation efforts. Additionally, we plan to consider revising our fellowship structure to allow for longer-term engagement and better coordination of individual activities.

6. References

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