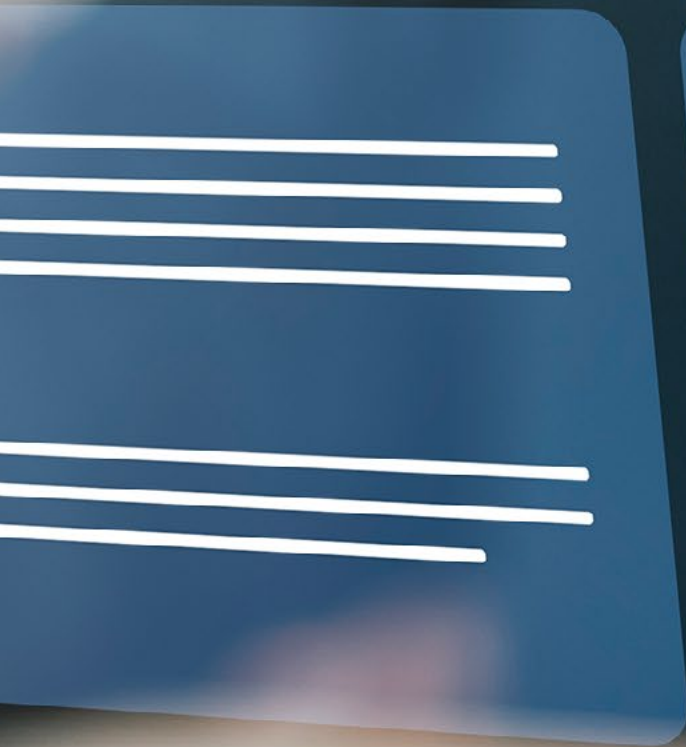# Future Recommendations, Priorities and Considerations in ICT Standardisation in Europe

Reflections by the StandICT.eu consortia

Authors

Silvana Muscella, Francesco Osimanti, Gabriele Quattrocchi, Maria Giuffrida, Claudio De Majo, Patricia Nugent (Trust-IT Services Srl), Sharon Farrell, Harshvardhan Pandit, XiaoRui Zhang (Dublin City University), Mona Marill (Australo), Lindsay Frost (NEC Europe & StandICT.eu EAG member), Knut Blind (Fraunhofer ISI), Astor Nummelin Carlberg (OpenForum Europe), Alexander Chourreau (European Digital SME Alliance).

Disclaimer

Acknowledgements

Over its three-year lifespan, StandICT.eu 2023 has sought to generate valuable recommendations and position statements that could offer significant insights for the European Commission policy setting. This has been mainly achieved through the synergistic and focused efforts of the EUOS (European Observatory on Standardisation), the EUOS Foresight Committee, and the External Advisory Group, which all consist of influential figures in the field of Standardisation. These entities substantially contributed to the development of StandICT.eu 2023 by providing a thorough and all-encompassing perspective on emerging technology standards policies globally.

In this context, the subsequent, non-exhaustive list, comprises key actionable recommendations that have been presented to the European Commission and StandICT.eu Project Officers during the running of the project and in the final technical report. These recommendations address diverse themes within ICT Standardisation, stemming from various tailored events and issued reports under the project duration.

The report delivers a set of recommended guidelines to the European Commission for different stakeholders to help identify which priority areas to focus future activity on.

The list is divided into Recommendations towards H2020, HE and DEP, Recommendations to SDOs, Recommendations to Technology Domain Area, Recommendations to Policy Makers and funding Agencies, and Considerations on Open Standards.

Recommendations to H2020 & HE & DEP Projects

▷ **All projects involving standardisation activities funded under Horizon Europe and the Digital Europe Programme (DEP) should meet together with European Commission representatives** for the different DGs through an annual workshop**, starting from Q1 2024, when several new HE & DEP projects will begin,** to encourage cross-pollination of research outputs and activities and to avoid working in silos and duplication of activities. The impact is maximised by working together. This should also be a forum for the DGs to outline their needs and vision for utilisation of outputs from these projects.

▷ All R&D projects funded under HE should be encouraged to avail the services provided by the **HSBooster. eu Horizon Standardisation Booster CSA**[1] project facility to boost their Standardisation potential and developments. The free nature of HSbooster.eu services is a strong motivator for projects to utilise the developed services and increase its uptake. A secondary objective of this would be to support the workshop mentioned above by analysing projects standardisation needs and potential through the HSBooster.eu services.

▷ The results and recommendations of the **European Standardisation Panel Survey** about the interface between research and standardisation should be considered for future funding programmes including standardisation.

Recommendations to Higher Education Institutions (HEIs)

▷ **Standardisation should be further promoted as part of curricula and courses**, and additional avenues should be explored to improve its academic integration through means such as "credentials" and "soft skills module" within respective disciplines (e.g. IT technologies, Cybersecurity, business management and project planning).

▷ Given that H2020, HE and DEP projects often contain industry members, it is essential to also get industry stakeholders on board to act as lecturers and to share their experience via teaching activities. Also, there is a need to create **industry clusters to improve knowledge exchange** about standardisation and ensure that demand and supply are both involved. This will have a favourable spill-over effect on various stakeholders. The professionalisation of standardisation should be part of the process to **encourage more people to become experts, especially the newer generation.** A significant hurdle in this is that : it is hard to pursue a career in a field without a name. Qualifications (e.g.: Diplomas) and certifications related to Standardisation Engineers would be one appropriate means to address these.

▷ Extra focus should be put on **skills development at company levels**, **and in particular SMEs**, via professional training and life-long learning. Particular attention should also be given to top-management levels, which currently lack role models, as the direct enablers for the promotion of standardisation skills among employees.

▷ The HE project Edu4Standards kicks off in 2024 will serve as a platform to coordinate all the efforts related to education at the EU level, but also to generate spill-overs to the national levels in all EU Member States. Edu4Standards should be informed of the developments from prior projects such as HSbooster.eu and StandICT.eu

[1]   StandICT. eu 2023 CSA project funded under the Horizon Europe Programme Grant agreement n.951972

and encouraged to both consolidate and improve upon the training materials by applying them in educational contexts and settings.

Recommendations to Public Research Organisations (PROs)

▷ Following the Code of Practice on standardisation published in March 2023, PROs should **increase their capacity to get involved in standardisation.**

▷ PROs should develop and implement indicators to evaluate their involvement in standardisation.

Recommendations to SDOs

▷ Increased efforts should be made to **draw the European portfolio of research projects into the SDO ecosystem** and also to enhance public awareness regarding standardisation, with a view to promote the integration of new and emerging technologies into the operational framework of SDOs.

▷ A fluid and effective dialogue between Global and European SDOs should be facilitated to **mitigate the possibility of duplication of effort**. This would not only prevent redundancy but also guarantee **a comprehensive awareness among Global and European SDOs regarding the ongoing initiatives within their respective counterparts**. This proactive approach would not only optimise resources but also facilitate a more synchronised and coherent effort in addressing shared objectives.

▷ While involving every individual from each stakeholder group in the standards development process may be challenging due to financial constraints or time limitations, **collaboration**, rather than isolation, **is crucial for ensuring the efficient development (and maturity) of standards**. Such collaboration should be undertaken as part of the above recommendations regarding reducing duplicity of efforts and increasing co-operation.

▷ Alignment of terminology should be promoted through strategic reports and guidelines that act as authoritative sources, especially in novel domains, where there is often a **lack of consensus or clarity in terminology**. This leads to confusion when different groups use different terms for the same concepts or similar terms to describe different contexts.

▷ To ensure widespread adoption of standards, **a more collaborative approach is essential, to provide guidance amongst numerous existing standards and rectify their implementation**. Early involvement of innovators in the process is also crucial.

---

2   Grant Agreement n. 101102757
3   Grant Agreement n. 101102718

Recommendations in Technology domain areas

▷ In the domain of **Digital Twins**, **CSA Calls should be leveraged** to segment the solutions into clear types of twins, their structures, and reusable building blocks for specific domains. It is vital to develop a set of best practices for utilising standards in digital twin implementations, aiding in the transition from isolated examples of twins, to methodologies. This includes defining "common good" twins versus Intellectual Property twins and establishing criteria for sound decisions regarding sustainability, resilience, and competitiveness. Defining reusable building blocks for each category of Digital Twin involves aligning various aspects "from bottom to top", similar to how it's done in the world of Internet of Things, of terminology, ontology, determining encoding of metadata vs encoding of actions, defining "best effort" vs "synchronisation of state", central vs federated architectures, latency, etc.

▷ **Blockchain** - Facilitate access to emerging technologies and engage in a constructive dialogue with active companies. **Collaborative opportunities for sharing knowledge can be advantageous**, particularly in initiatives like ISO TC 307 WG6, which focuses on industry-facing Blockchain and Distributed Ledger Technology (DLT) use cases. Encouraging the participation of startups at plenary meetings, both locally and globally through national body relationships, is a strategy worth exploring, provided that expertise gained is shared in some way (multiplier effect). An awareness of the costs/benefits of each type of Blockchain should be fostered, to promote sustainable choices. BLOCKSTAND[2] & SEEBLOCKS[3] are two DEP projects providing funding to European experts in the blockchain and DLT ecosystem.

▷ **5G** - Identify the unique selling propositions (USPs) of each Standard Development Organisation (SDO) in areas covered by other SDOs. **Leverage the strengths of each SDO and promote collaboration where contributions complement one another.** Encourage joint activities and small projects that involve multiple stakeholders (in particular SMEs), emphasising the standardisation of crucial aspects or assets within a technical setup. Provide inputs and resources for emerging standards tracking and submissions tracking mechanisms, connecting initiatives SDOs and 5G PPP and SNS JU projects. The HE CSA projects 6GStart[4] and SNS OPS[5] are already setting up this tracking mechanism through the creation of a Standards Tracker online tool, building upon previous versions.

▷ **Digital Product Passport** - Establish a common vision, conduct detailed research, and provide training for market actors in the context of the European Commission's initiative for a Digital Product Passport (DPP). **The DPP should rely on standards developed by the European industry for data exchange in industrial value chains**. This approach would support

---

4   Grant Agreement n. 101069987
5   Grant Agreement n. 101095811

a data economy aligned with EU values and contribute significantly to European sovereignty in data-based business models. Using DPP to promote the Circular Economy[6] should be a priority.

▷ **eHealth** - Implementation of eHealth requires consolidation of multiple disciplines and existing standardisation efforts, such as health and safety, medical devices, information management and security. This requires establishing a common vision to identify the relevant standards as well as gaps and future potentials as so to facilitate responsible innovation and support upcoming regulations. Discussions on standards should always include an awareness of the **European respect for Human Rights** and take account of issues which may arise as a result of new technologies in the health environment.

▷ **Artificial Intelligence** - AI is a rapidly innovating domain and research should be promoted so that multiple options are pursued, that cover all aspects of AI Development and use, and especially provide valuable guidance into operation and safety through measures such as - a range of practical benchmarks defined in specifications, and end-user awareness of the fallibility built into the user interface. In addition, future standardisation efforts should seek to support both regulatory oversight (eg EU's AI Act requirements for harmonised standards) as well as industry best practices (eg technical implementations and evaluations)

▷ **Quantum Technologies** – Leverage the work and influence of the High-Level Forum on Standardisation to get all relevant European stakeholders around the table on the topic, and structure its way forward regarding standardisation implications.

Recommendations to Policy Makers

▷ **Need to guide Digital Markets** - The Digital Transformation is so crucial for most aspects of society and sustainability, with stakeholders (old and new) loudly voicing their concerns, that governments feel almost forced to directly incorporate technical requirements into their legal frameworks and regulations e.g. by introducing important Standardisation Requests into the ESO system, or by direct means. Such decisions, if made without comprehensive community engagement from industry and social partners, can result in **regulations that might not adequately address the multifaceted nature of the digital world. Insufficient "buy in" from all stakeholders could** challenge an open governance model and **fatally slow the creation and acceptance of technical specifications**.

▷ **Politicisation of Standardisation** - As of today, national economies heavily depend on using interoperable technologies, and also on the definition of products using common standards, so as to encourage international trade (preferably to their advantage). This politicisation seems evident as nations publish their own standardisation strategies, including lists of critical technologies, which indicate the strategic interests and priorities of a country. Alongside this, there's an emphasis on promoting into the standardisation discourse those solutions which reflect or enable the ethics and values of the particular nation(s), which might not be intended as political, but can be perceived that way. Therefore, the **European Union needs to monitor new technical standards and evaluate whether they are consistent with EU digital sovereignty.** It is not necessary to monitor by whom or how a standard is proposed, but rather to judge its impact on society. In this sense, it is similar to monitoring innovations in e.g. genetics: it is not important who makes the discoveries, but it is crucial to take care if/how they are used.

▷ **Focus more efforts on the adoption of standards**, instead of just their development. Many standards are not efficiently adopted by companies, especially SMEs. Mandating the use of relevant standards in public procurement could be a positive step towards establishing markets and benchmarks.

▷ **Acknowledge the "standards explosion"** - For nearly a century, the standardisation ecosystem has expanded exponentially in breadth and depth, driven by technical innovation and international trade. Human institutions founded upon a slower pace, and today's individuals attempting to bridge the many gaps between related working groups, are very severely challenged. Adding more experts (viz. "training") may temporarily help, funding projects such as StandICT.eu or HSBooster.eu to assist in "bridge building" definitely helps, but some fundamental paradigm shift will (soon) be needed. Now is the time to develop and trial new approaches.

6   https://environment.ec.europa.eu/strategy/circular-economy-action-plan_en

- ▷ **Consider activities in standardisation in R&D tax schemes** - Only very few Member States consider standardisation activities as eligible in R&D tax schemes. In particular, SMEs would benefit from such an expansion of the tax base.

Concluding Remark on Software Regulation, Standardisation and Open Source and Open Standards

The world of open source, with its ethos of sharing and version control, has shifted the paradigm for software. While resting on a strong intellectual property foundation, the open source approach is unconventional compared to voluntary standardisation, which has historically been anchored in the realm of tangible, finite assets. In the currently networked ecosystem **there is the need for end-to-end solutions with pieces of software from different vendors working seamlessly together to enable interoperability**, allowing technologies to be connected or integrated and work together.

New EU legislation, including the Interoperable Europe Act, the Cyber Resilience Act (CRA), the Product Liability Directive, and the AI Act, introduces new requirements for stakeholders in the software ecosystem.

Understanding the relationship between open source and standardisation is paramount in the evolving ICT standardisation space, and in all technology areas covered in this document. Embracing this relationship and comprehending its dynamics are crucial for developing standards for new EU legislation and support the continuous evolution and resilience of the software ecosystem. Stakeholders, including SDOs, policymakers, technologists, and academia, must actively engage in this discourse, ensuring that standards developed not only align technically but also foster innovation in open source software development. The goal should be to create a robust, adaptable, and inclusive software ecosystem that balances the open source ethos with the rigour of standardisation and regulation, ultimately benefiting Europe's digital landscape.

For example, when developing the standards for the implementation of these acts, it is necessary for the standards to be implementable in open source software, i.e. be open standards. This is essential because a significant portion of software used in Europe (and the world) is open source or incorporates open source components. Also proprietary software often heavily relies on open source components. The Standardisation Requests (SR) should explicitly include this as a fundamental requirement for all requested standards.

Neglecting this aspect could adversely impact the entire digital ecosystem in Europe. This consideration is equally relevant for all harmonised European standards that pertain to legal acts involving software.