Stakeholders´ Needs and Priorities for Standardization for Blockchain and Distribution Ledger

Fraunhofer ISI

Simone Wurster, Knut Blind
Fraunhofer ISI, and TU Berlin, Innovation Economics
Simone.Wurster@isi.fraunhofer.de, Knut.Blind@isi.fraunhofer.de

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Background

Standardization and standards are key enablers of economic growth and are widely recognized as effective tools for addressing specific economic challenges. In light of increasing global competition and a more complex geopolitical landscape, it is crucial to strengthen the European Union's presence in international standardization bodies. In this context, blockchain technology plays a pivotal role, offering the potential to fundamentally transform how information is shared and transactions are conducted online.

This research seeks to guide future initiatives aimed at promoting European values, ethics, and policies across eight strategic areas:

Electronic identification and trust services (EUID – eIDAS2[2]), General Data Protection Regulation (GDPR), Data Act, Artificial Intelligence Act, Interoperability across terretories (US, Australia, etc.), Smart Contracts, Decentralised Identifiers (DIDs) in Smart Contracts and beyond, CO_2 footprint of blockchain

Method

The process began with an initial literature review covering the eight strategic areas outlined above. These findings were integrated with analyses of sources available on **SEEBLOCKS.eu** as well as relevant publications from the European Commission.

A two-stage public consultation was launched on 15 November 2023 and introduced by Delaney et al. (2024) under the title *"Future blockchain and DLT Standardization Topics."* The second phase was conducted between 1 July and 15 September 2024, involving 26 experts from 14 European countries (Fig. 1 – Fig. 3).

Preliminary findings were shared with multiple expert groups across Europe in the fields of blockchain, Information and Communication Technology (ICT), and standardization. These insights were further refined through stakeholder engagement during an event in early 2025, complemented by additional literature reviews.

SEEBLOCKS.eu event in 2025 In New Orleans, USA

SEEBLOCKS.eu event in 2025 In Brussels, Belgium
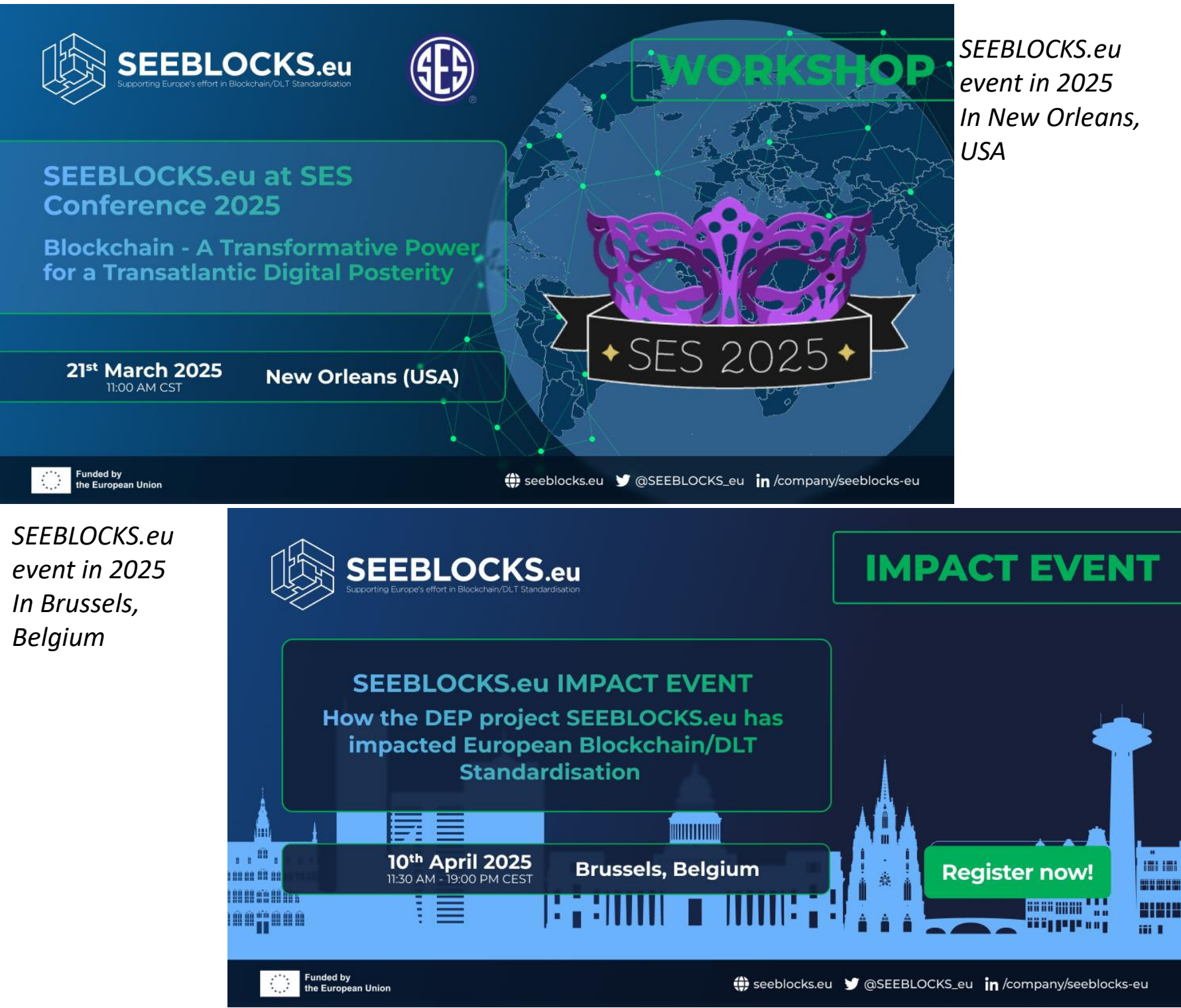
Results of the public consultation

In addition to interoperability, key standardization and regulatory support needs have been identified in the areas of data exchange, electronic identification, and DIDs.

Furthermore, the majority of participants indicated the importance of developing standards addressing the CO_2 footprint and data protection within the context of blockchain and Distributed Ledger Technologies (DLT) (Fig.1).
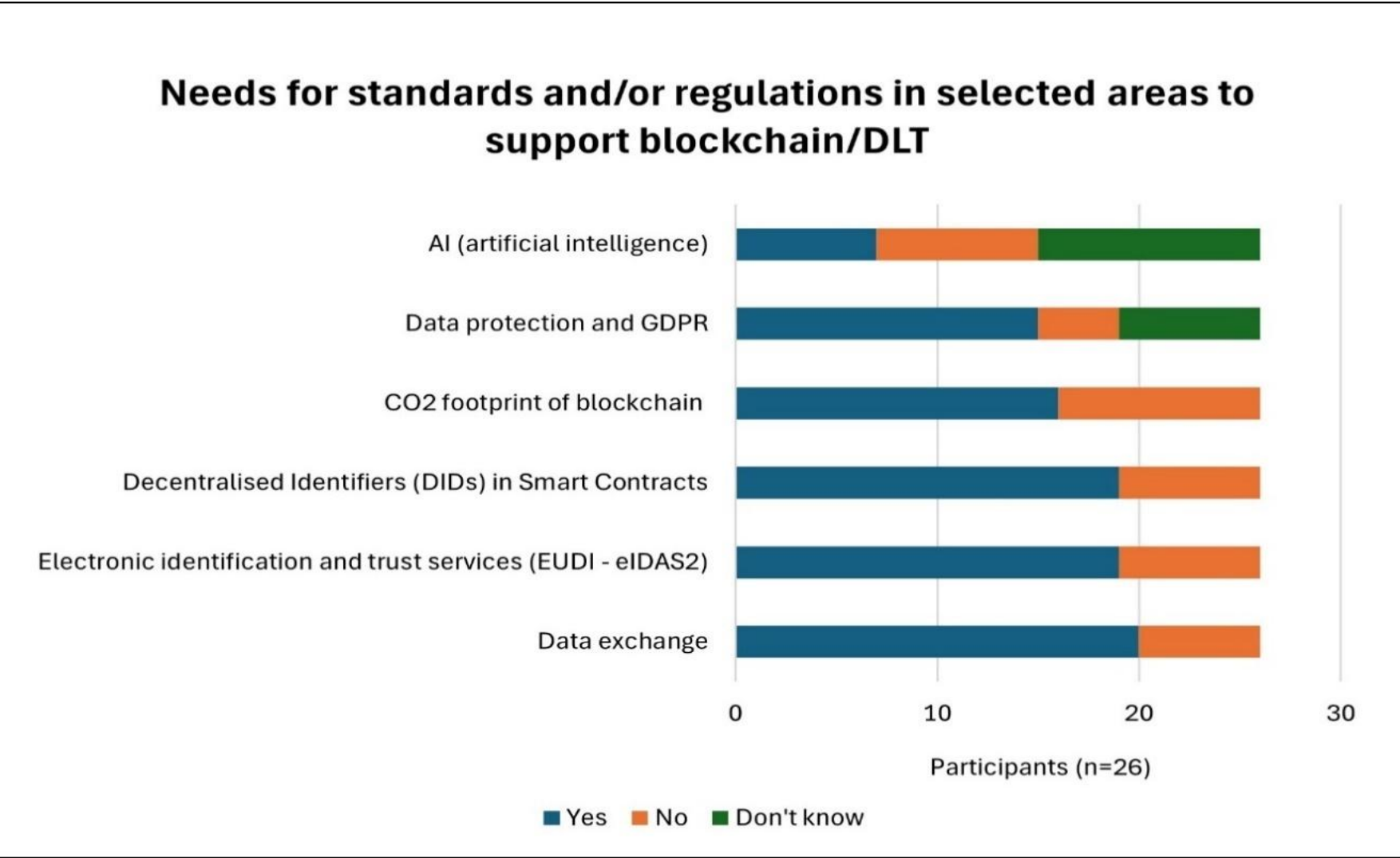

Figure 1: Needs for standards and/or regulations in selected areas to support blockchain/DLT
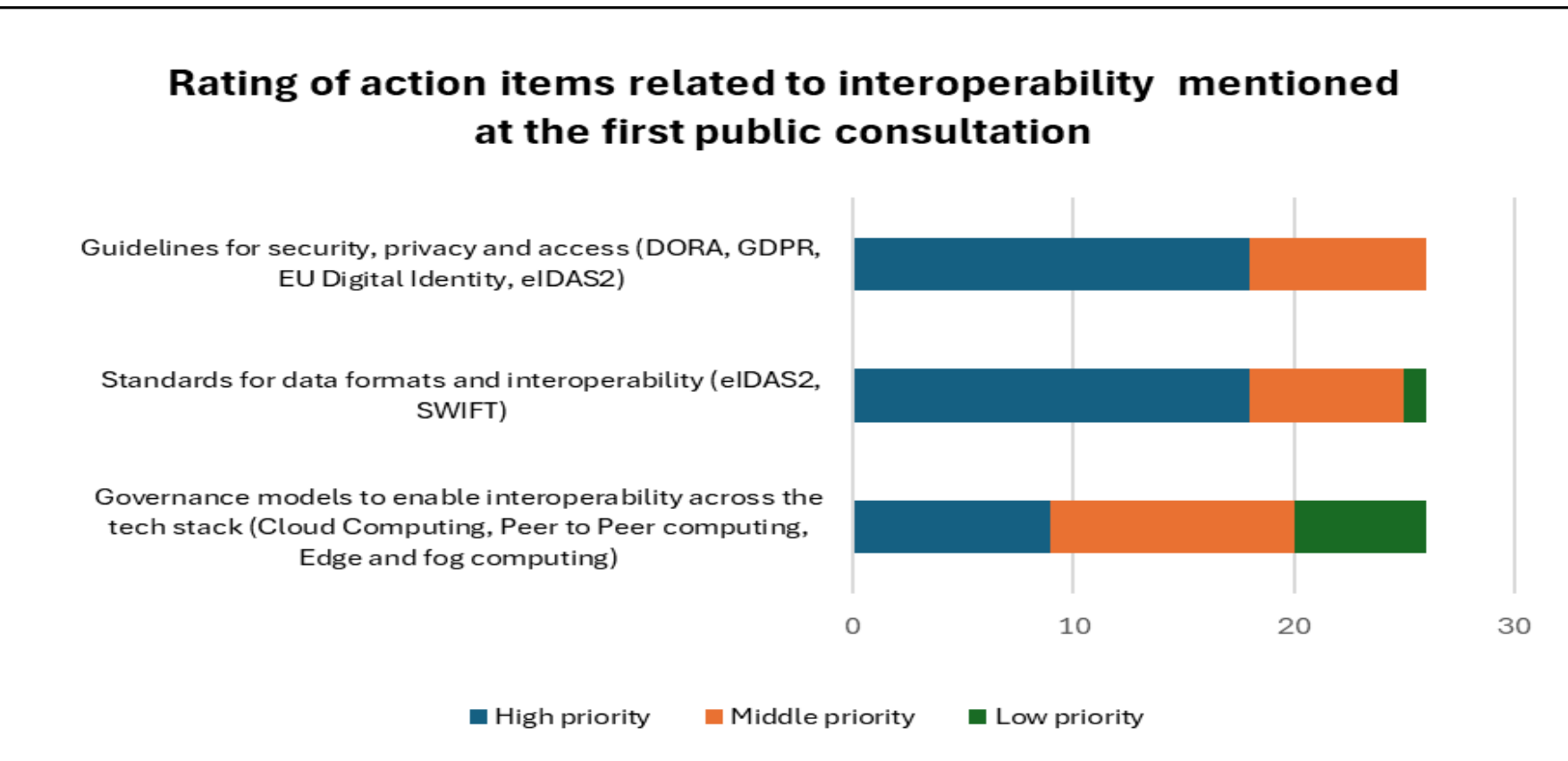

Figure 2: Ranking of action items related to interoperability

Regarding specific regulatory support needs, participants submitted 15 sets of suggestions - ranging from single keywords to more elaborated proposals in subsequent parts of the consultation. Additional recommendations addressed broader policy measures to advance blockchain/DLT adoption, including funding targeted projects and establishing regulatory sandboxes. Further input highlighted the need for standardization and regulation to enhance interoperability in blockchain/DLT systems (Fig. 3). Suggestions also covered general support for the technology, such as standardizing data and identity formats, facilitating secure data exchange, ensuring interoperability between DIDs, developing auditing standards, and creating sector-specific rulebooks (Fig. 2).
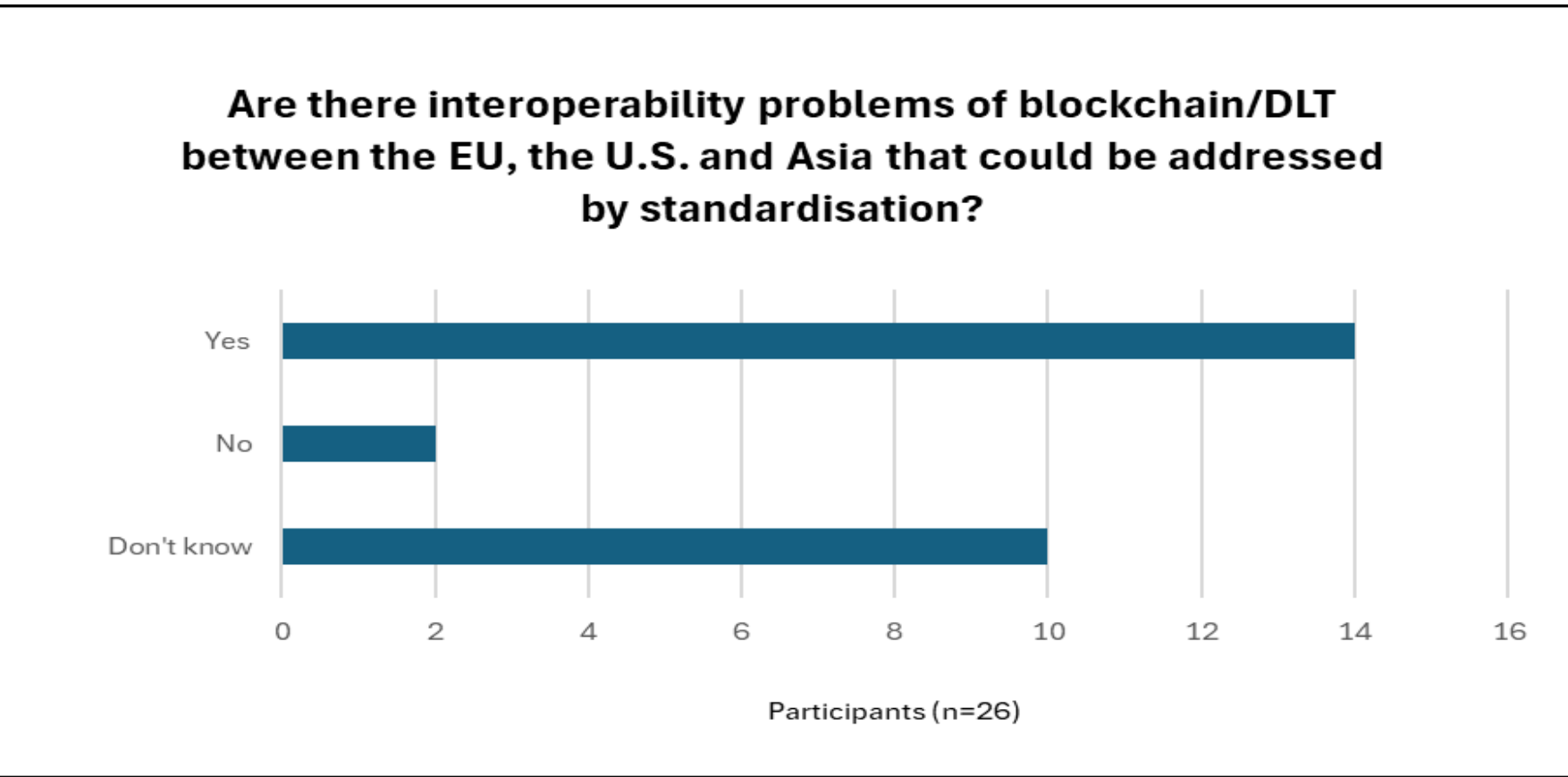

Figure 3: Perception of interoperability problems that could be addressed by standardization

Specification of priorities

Drawing on the literature review, the public consultation, and the additional modification measures, key priorities for blockchain standardization and related policy measures have been identified and classified according to short-, medium and long-term topics according to Table 1 and Table 2.

Inspired by European Commission and INATBA (2022) and additional analyses, we propose the establishment of

"Joining Forces for Blockchain Standardization and Regulation" groups on Smart Contracts, Digital Identity, Governance, Interoperability & CBDC/Crypto Assets to foster structured dialogue and coordination between standardization and regulatory domains as a first short-term priority. The standardization table (Table 1) contains 8 short-team goals starting in 2025, 2 medium-term goals starting 2027 and one long-term goal starting beyond 2027. The policy table (Table 2) contains 4 short-term, 5 medium-term and 1 long-term goal.

Short-Term: starting 2025
- Joining Forces for Blockchain Standardisation and Regulation working groups
- Guiding standard for security, privacy and access that specifically considers the European requirements of DORA, GDPR, EU Digital Identity, eIDAS2
- Interoperability and data formats
- Electronic identification and trust services (e.g., related to EUDI - eIDAS2)
- Decentralised Identity (e.g., SSI, DID, eIDAS2)
- Smart Contract security
- Sustainability and safety for consumers, standards towards assessing environmental and sustainability impact including, in particular, CO_2 footprint and energy consumption of different blockchains/DLTs, MiCA, EU Sustainable Finance taxonomy[1]
- Blockchain-supported trusted AI

Medium-Term: starting 2027	Long-Term: starting 2027+
• Additional needs regarding data formats and data exchange • Additional data protection topics	• Needs for additional[2] cross-technology standardisation topics in the blockchain context, also with specific consideration of ethical aspects

[1] Updated priority based on the ICT Rolling Plan 2025, replacing the sustainability priority of this report's first version, which is already considered by the time of this report's completion

[2] In addition to blockchain and AI

Table 1: Needs for standardization

Short-term priorities
1. Joining Forces for Blockchain Standardisation and Regulation" working groups
2. Legal validity and enforceability of Smart Contracts
3. DID policies and suitable regulatory framework conditions to support the interoperability between DIDs
4. Support education on blockchain standardisation

Medium-term priorities
1. Suitable regulatory framework conditions for blockchain governance
2. Regulatory support for trusted registries
3. Additional regulatory measures for Decentralised Finance
4. Sustainability framework
5. Specify standardisation education, analyse updated education needs

Long-term priorities
1. Adjust blockchain and ICT standardisation education strategies

Table 2: Suggestions for policy support

Outlook

Key needs for standardization and policy-based support have been identified and summarized in Table 1 and Table 2. These topics are categorized and allocated to relevant stakeholders accordingly.

Three main barriers to progress were identified: 1. Lack of coordination among different Standards Developing Organizations (SDOs), 2. Barriers and gaps within specific standardization projects, 3. The complex interrelation between standardization and policymaking.

Potential countermeasures were also discussed and are intended to inform the development of a more detailed roadmap for blockchain standardization.

Elements of this research have already contributed to the EU's ICT Rolling Plan 2025, with further input planned for upcoming editions.

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