Alliance for Internet of Things Innovation

Brussels, 13 June 2022

AIOTI Views on the EU ICT Standardisation Rolling Plan

Chapter: INTERNET OF THINGS (update actions and/or add any other actions, with justification)

https://joinup.ec.europa.eu/collection/rolling-plan-ict-standardisation/internet-things-0

Current IoT related actions

https://joinup.ec.europa.eu/collection/rolling-plan-ict-standardisation/rolling-plan-2022)

Action 2 SDOs to continue ongoing work in the area of semantic standards for better data interoperability. Special focus should be put on further extending the SAREF ontology both in number of extensions and the content of each extension. The results of European projects (such as the large scale IoT pilots and similar) could be used to achieve this, by providing interoperability profiles, associated justifications (interoperability cases) that would extend current standards e.g., ISO 21823 IoT interoperability.

Rationale: Promote interoperability profiles (in particular based on SAREF) developed in European projects towards standardisation.

Action 3 SDOs to provide standards supporting compliance, and standards enabling the integration of AI and data processing capabilities, the integration into digital twin systems into IoT products, systems, applications and processes.

Rationale: Make sure IoT and Edge Computing are integrated properly in European work on data spaces and digital twins.

Action 4 Develop a European standard for cyber security compliance of products that is aligned with the current compliance framework of organisations based on the ISO 27000 Information Security Management Standards series and the GDPR regulation and the future compliance framework of systems based on standards such as ISO/IEC 27100, ISO/IEC 27400, 27402, 27403, ISO 31700. Preferably the standard could be used to harmonise the requirements set out in the NIS directive and the cybersecurity certification framework.

Rationale: Compliance is both at the organisation level (hence ISO 27000, 27100) and at the product level. Standards at product level have not converge yet.

Action 9 SDOs should look in the standardisation needs of the new edge paradigm and investigate the impact on it of the specific use cases of the verticals (such as *health,* energy, mobility, agriculture and other).

New Proposed Actions:

Action 10 More collaboration/synchronization between standardization bodies (e.g., ETSI SAREF, W3C SOSA/SSN, IEEE 1872.2 Autonomous Robotics Ontology, ISO 21823- 3 IoT Semantic Interoperability, etc.).

Rationale: To include experience from various European projects fiesta-iot H2020 project with W3C SSN ontology, interconnect project with ETSI, etc.

Action 11 SDOs should consider addressing the standardisation of federated Learning and AI for IoT edge related challenges. In particular, federated Learning brings AI models close to the edge to enhance data protection, improve inference reliability, and increase autonomy of end clusters (e.g., end IoT/IIoT devices, on-premises servers, etc.). The cloud plays a federation role for aggregating insights from different IoT edge distributed clusters to generate a federated model shared with each individual cluster. Such standardisation challenges are: (1) workflow standardization, (2) interfaces edge/cloud, orchestration, (3) model contamination, and (4) pipes for handling distributed traffic.

Rationale: This new Action is based on the recomendation provided in the AIOTI report: "High Priority Edge Computing Standardisation Gaps and Relevant SDOs" that identifies this action as a high priority standardisation gap.

Action 12 SDOs should get involved in the standardisation of IoT Swarm Systems. In particular, focus on concepts for IoT intelligence clustering to promote collaboration and share of resources and functions for performing specific tasks. These concepts impose standardisation challenges in the required architecture, such as interfaces, data models and ontologies and as well security and privacy models.

Rationale: This new Action is based on the recomendation provided in the AIOTI report: "High Priority Edge Computing Standardisation Gaps and Relevant SDOs" that identifies this action as a high priority standardisation gap.

Action 13 SDOs should focus on standardisation needs for IoT and edge computing coexistence/integration/interoperability and continuum across several sectors and platforms. In particular, the use of end-to-end capabilities of IoT technologies across the edge granularity and beyond impose continuum standardisation challenges, such as support of interoperability by the means of new interfaces, data models, security and privacy models and security and privacy models.

Rationale: This new Action is based on the recomendation provided in the AIOTI report: "High Priority Edge Computing Standardisation Gaps and Relevant SDOs" that identifies this action as a high priority standardisation gap.

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Action 14 SDOs should consider addressing standardisation challenges for **service discovery** and authentication in the context of distributed and federated edge computing systems and in particular, for scenarios where multiple mobile devices are used that require services simultaneously and uninterruptedly. There is a challenge of effectively managing billions of IoT devices, ensuring that they are suitably configured, running appropriate software, kept up-to-date with security updates and patches, and run only properly authenticated and authorised applications. **Authentication** of services and service providers, while accounting for resource usage, is also an essential part of the economics of the network of the future. There is a need of ensuring interoperability across platforms, devices, and locations, by enabling assets to be securely purchased and transferred between virtual and real-world locations, authenticated and validated, using various consensus methods that support the validation of identity, ownership, and usage rights of any asset subject to relevant rights.

Rationale: This new Action is based on the recomendation provided in the AIOTI report: "High Priority Edge Computing Standardisation Gaps and Relevant SDOs" that identifies this action as a high priority standardisation gap.

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Chapter: CLOUD AND EDGE COMPUTING

https://joinup.ec.europa.eu/collection/rolling-plan-ict-standardisation/cloud-and-edge-computing-0

Current CLOUD AND EDGE COMPUTING related actions

New Proposed Actions:

Action 8 SDOs should focus on addressing the edge/cloud X-continuum paradigm and standardisation challenges. In particular, due to huge increase of connected devices and systems, several computing deployments are embracing the notion of computing continuum, where the right compute resources are placed at optimal processing points, i.e., cloud data centre, edge computing systems and end devices, This requires the support of: (1) continuum of technologies across sensors, connectivity, gateways, edge processing, robotics, platforms, applications, AI, and analytics, including underlying technologies like optical, wireless (cellular and non-cellular) and satellite communications, (2) continuum of intelligence and edge capabilities, (3) continuum of edge applications across vertical sectors and seamless integration.

Rationale: This new Action is based on the recomendation provided in the AIOTI report: "High Priority Edge Computing Standardisation Gaps and Relevant SDOs" that identifies this action as a high priority standardisation gap.

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Chapter: BROADBAND INFRASTRUCTURE MAPPING

https://joinup.ec.europa.eu/collection/rolling-plan-ict-standardisation/broadband-infrastructure-mapping-0

Current BROADBAND INFRASTRUCTURE MAPPING related actions

New Proposed Actions:

Action 2 SDOs to focus on addressing the integration of optical network and cloud technologies to enable computing continuum capabilities and their impact on underlying broadband infrastructures. In this context, SDOs should enhance as well the QoS, QoE, KQI, KPI (e.g., energy consumption), methodologies and assessment measurement tools to consider computing continuum (compute-optical communication integrated systems) capabilities.

Rationale: This new Action is based on the recommendation provided in the AIOTI report: " Computing Continuum Scenarios, Requirements and Optical Communication enablers" that identifies this action as a standardisation gap.

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Chapter: ICT Environmental Impact

https://joinup.ec.europa.eu/collection/rolling-plan-ict-standardisation/ict-environmental-impact-0

New Proposed Actions:

Action 6 SDOs should focus on defining a methodology to measure the benefit of using ICT, e.g., IoT and Edge, **for Energy and** Carbon Footprint reduction in industrial sectors

Rationale: This new Action is based on the recomendation provided in the AIOTI report: "High Priority Edge Computing Standardisation Gaps and Relevant SDOs" that identifies this action as a high priority standardisation gap.

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Chapter: CIRCULAR ECONOMY

https://joinup.ec.europa.eu/collection/rolling-plan-ict-standardisation/circular-economy-0

New Proposed Actions:

Action 8 SDOs should address the specification (or modification of existing) interfaces that help monitor and control of the energy usage and carbon footprint in communication protocol layer stacks applied in ICT, e.g., IoT and edge computing solutions.

Rationale: This new Action is based on the recomendation provided in the AIOTI report: "High Priority Edge Computing Standardisation Gaps and Relevant SDOs" that identifies this action as a high priority standardisation gap.

Action 9 SDOs should focus on specifying (or modifying existing) ICT, e.g., IoT and edge computing related standards, interfaces, data models and ontologies to reduce the energy and carbon footprint (by e.g., monitoring and controlling energy and carbon footprint) in industrial sectors.

Rationale: This new Action is based on the recomendation provided in the AIOTI report: "High Priority Edge Computing Standardisation Gaps and Relevant SDOs" that identifies this action as a high priority standardisation gap.

Action 10 SDOs should focus on specifying (or modifying existing) security and privacy by design standards required to secure the ICT, e.g., IoT and edge computing solutions applied to monitor and control energy and carbon footprint usage in industrial sectors and which are as well able to protect any personal data lifecycle used by these solutions.

Rationale: This new Action is based on the recomendation provided in the AIOTI report: "High Priority Edge Computing Standardisation Gaps and Relevant SDOs" that identifies this action as a high priority standardisation gap.

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About AIOTI

AIOTI is the multi-stakeholder platform for stimulating IoT Innovation in Europe, bringing together small and large companies, start-ups and scale-ups, academia, policy makers and end-users and representatives of society in an end-to-end approach. We work with partners in a global context. We strive to leverage, share and promote best practices in the IoT ecosystems, be a one-stop point of information on all relevant aspects of IoT Innovation to its members while proactively addressing key issues and roadblocks for economic growth, acceptance and adoption of IoT Innovation in society.

AIOTI's contribution goes beyond technology and addresses horizontal elements across application domains, such as matchmaking and stimulating cooperation in IoT ecosystems, creating joint research roadmaps, driving convergence of standards and interoperability and defining policies. We also put them in practice in vertical application domains with societal and economic relevance.

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