



Welcome to the World of Standards



SPECIALIST TASK FORCE 505 IOT STANDARDS LANDSCAPING & IOT LSP GAP ANALYSIS

Final STF 505 Workshop

AIOTI WG3 Workshop

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February 8, 2017 - Brussels

- Two Technical Reports: information, facts, analysis
 - TR 103 375 **LANDSCAPE**
 - Analysing the standards landscape, it provides a list of existing standardised technologies suggested for (re)use by the LSPs
 - A view of what LSPs can based their work on
 - TR 103 376 **GAPS**
 - Identifying technical standards/ societal/business gaps as a good indication of the level of maturity of standardization in a given vertical domain
 - A view of which questions LSPs can contribute to resolve
- Points of view
 - On the status of IoT Standardisation (e.g. on fragmentation)
 - On the IoT Service Platform
 - On the priorities for the resolution of gaps by the IoT community
- Identification of major challenges for IoT standardisation
- Feedback from LSPS and panel discussion

- Enough standards to start with
 - 150 Generic standards; 179 Domain-specific standards
 - 70% in Communication/Connectivity; Architecture; Interoperability
 - Top 3 "verticals": Smart Mobility, Smart Living, Smart Manufacturing
- Reduced fragmentation of the landscape
 - A number of actors in the "horizontal" domain
 - Many existing communication standards apply to IoT
 - A relatively low number of new standards in support of new technologies
 - Some overlaps, but time (and refined use cases) will tell
 - A limited number of actors in the vertical domains
- Good news for LSPs!
 - IoT systems: complex developments in a complex landscape
 - Standards are here to help, not to complicate the design choices

The main gaps

🌐 Gaps in Knowledge Areas

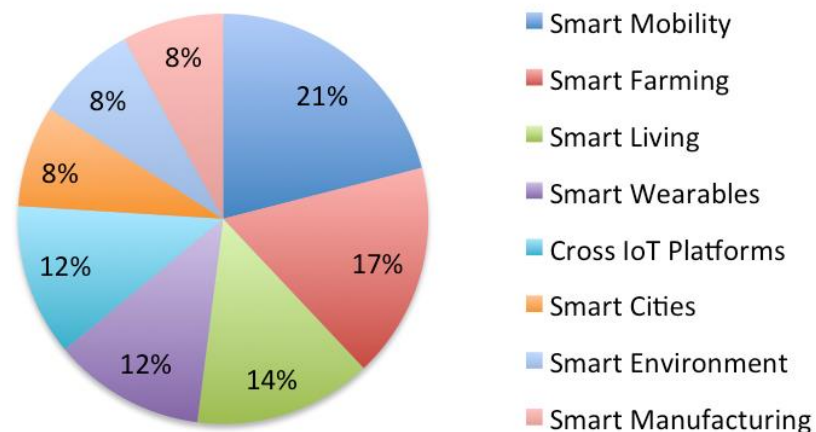
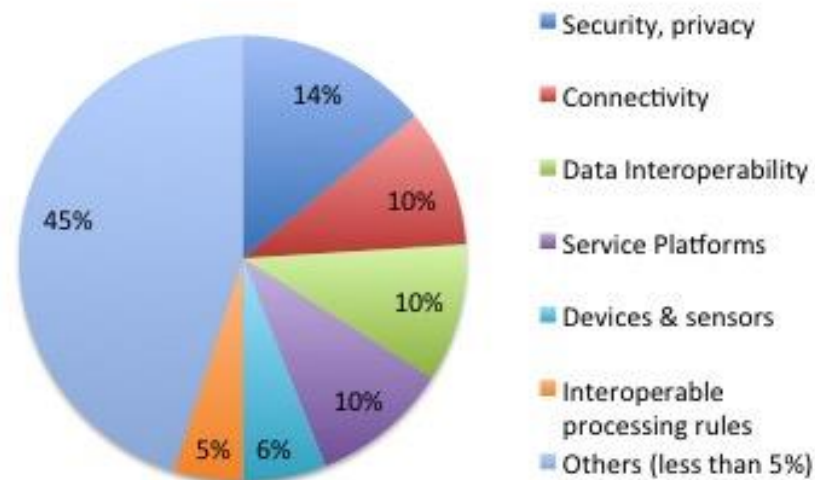
- The "usual suspects"
 - Security/Privacy #1 also in IoT
 - Data Interoperability is a strong #2
 - Connectivity
- The Service Platform(s)
- Usability (configuration, remote access, ...)

🌐 Gaps in "verticals"

- In all verticals
- Various degrees depending on
 - Existing "stock" of standards
 - Complexity
 - Maturity in perception of gaps

🌐 Expectation #1: harmonization

- Connectivity
- Data model translation mechanisms
- Global-level standards



● The IoT service platform

- A coherent set of standards
- An underlying architecture

● Platforms versus products

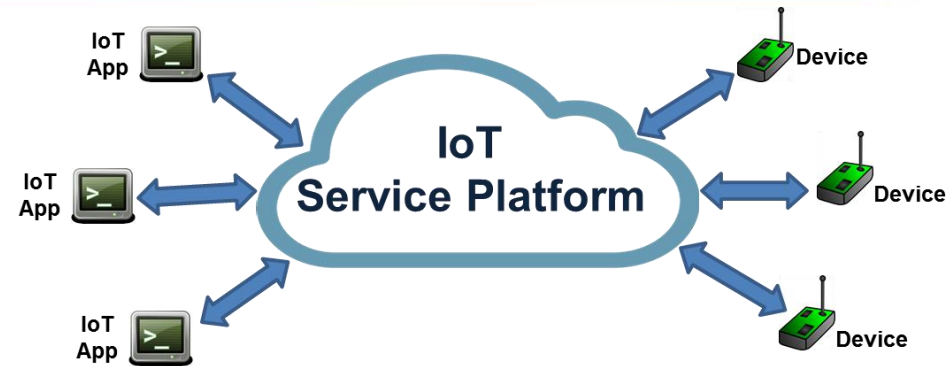
- Hundred of IoT products
- Only a handful of service platforms that package multiple standards

● Perception

- Fragmentation
- Lack of interoperability

● Expectations / challenges

- Interoperability from devices to applications
- High-level support of data interoperability (semantic interoperability)



Connectivity

- *GAP: Multiple communications and networking technologies;*
 - Difficulty in making a choice based on the standards alone
 - RESOLUTION: Consider additional criteria, such as security, energy, cost
- Interoperability will impact the choice of the IoT service platform
 - Some platforms have interworking/interoperability in their DNA (e.g. oneM2M)
 - All platforms must support interworking with other platforms (e.g. data exchange)

And beyond

- IoT is also about devices
 - Device Management is critical (e.g. for scalability), requires more standard support
 - Standardized approaches to measure, qualify, interpret sensor data
- IoT is also about applications and object life-cycles
 - More APIs to support application portability over devices (a role for open source?)
 - Standards should help migration of objects through different eco-systems

[Societal] GAP: Usability

- RESOLUTION: Develop tools to ease installation, configuration, maintenance, operation of devices, technologies, and platforms.
- RESOLUTION: Simplify the personalization of the system. Enable easy accessibility and usage to a large non-technician public
- RESOLUTION: When suitable, allow secure remote access to perform device maintenance. Enable continued support to the client after purchase

GAP: Applications tailored to individual needs: evolution, flexibility of the components

- RESOLUTION: Standardized methods to distribute software components to devices across a network
- RESOLUTION: Built-in application performances' monitoring.

- More support to verticals in the common service layer
 - *GAP: Data interoperability: lack of easy translation mechanisms between different specific models. Need of a global and neutral data model. Seamless inter-working between data systems*
 - RESOLUTION: Develop semantic interoperability for harmonization
 - *GAP: Interoperable processing rules: lack of definition for advanced analysis and processing of sensor events and data to interpret the sensor data in an identical manner across heterogeneous platforms*
 - RESOLUTION: Develop guidance for decision-making processes, for data organization, storage and exchange.
- More possibilities to collaborate between verticals
 - Improved plug & play capabilities between different architectures
 - Cross-domain APIs to support application portability

- Two potentially "make or break" issues
- Privacy
 - *GAP: Privacy and security issues can be a blocking factor for user's acceptance and prevent large scale deployments. Security and privacy are addressed on an isolated basis for part of the applications*
 - RESOLUTION: Develop "classes of devices" and tagging; Develop mature data management, data security, data privacy and ownership standards; Develop data rights management
- Security
 - *GAP: Lack of highly secure and trusted environments*
 - RESOLUTION: Build Risk Management Framework and Methodology; Develop a workflow to establish trust between the players
- A global challenge: education
 - Privacy by design; Security by design – How can standards help?
 - Security and Privacy to central/critical to be delegated to specialists

- Three LSP have presented their initial views
 - ACTIVAGE ACTivating InnoVative IoT smart living environments for AGEing well
 - IoF2020 Internet of Food & Farm 2020
 - SYNCHRONICITY IoT Large Scale Pilot for Smart Cities
- Much more than standardisation
 - Business Models; Use cases; Prototype implementation; ...
- But a view on standards anyway
 - To develop innovative business plans (*ACTIVAGE*)
 - To support standardization and concentration activities through and based on the interoperability components of AIOTES (*ACTIVAGE*).
 - Different types of standards to be considered (*IoF2020*)
 - Contribute to: EC ICT Rolling Plan; ETSI ISG CIM); AIOTI: WG3, WG8; SF-SSCC (SSCC-CG); EIP-SCC; CITYKeys & ESPRESSO; ITU-T (*SYNCHRONICITY*)

- Platforms and beyond
 - Platform consolidation will happen (but no one-fits-all solution)
 - Next: system(s) to system(s) approach with semantics interoperability)
- Semantics interoperability
 - Is difficult in "real-life" (outside the lab); requires industry engagement
- Business Models
 - Agility will create disruptions; better address them in common
 - New models will emerge that associate incumbents and new comers
- LSPs are going to be important/critical in
 - Making semantic interoperability a mainstream topic in industry
 - Handling eco-systems, ad-hoc infrastructures, "IoT operating systems"
 - Catalyzing the business models and transfer use cases to standards

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Thanks for your attention