Internet of Things: From R&D to Standardisation
The challenge of convergence

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European Commission - DG CONNECT
Standards

Fighting acute NIH syndrome

How standards proliferate:
(see: AvC chargers, character encodings, instant messaging, etc)

Situation: There are 14 competing standards.

14?! Ridiculous! We need to develop one universal standard that covers everyone's use cases. Yeah!

Soon:

Situation: There are 15 competing standards.

Too many competing standards.
The rule of Not Invented Here

Standards
They are great, everyone should have their own.

HORIZON 2020
Standards

What for?
IoT Adoption is maturing

**EUROPEAN IoT SPENDING BY INDUSTRY**
(2018 Size and 2018-2022 CAGR)

**IOT ADOPTION ACROSS EUROPEAN VERTICALS**
(% of companies with more than 10 employees adopting at least one IoT solution in 2018)

Source: IDC Worldwide Semiannual Internet of Things Spending Guide 2019
Approach for Digital Industrial Platforms

- Processes
  - Manufacturing of goods and fluids
  - Agro-Food
  - Energy
  - Automotive Mobility
  - Smart City / Home, Buildings

- Products
  - Health and well-being Industry

- Sectors
  - Marketplace
  - Big Data and Cloud
  - Autonomous systems / Artificial Intelligence
  - Cyber-physical and safety-critical Systems
  - IoT/Connectivity
  - Digital / electronic systems / components
EU Multi-Stakeholder Platform on ICT Standardisation (MSP): Advice, Standards Collaboration and Coordination
The Rolling Plan on ICT Standardisation
**IoT in the Rolling Plan on ICT Standardisation**

**RP2016 Internet of things: the foundations**
- **Action 1**: Interoperable IoT, working with ESOs and international SDOs toward consensus
- **Action 2**: Interoperable IoT numbering space, open identification and authentication
- **Action 3**: Explore options for trust, privacy and end-to-end security
- **Action 4**: Promote the uptake of IoT standards in public procurement

**RP2018 Internet of things: Maturity**
- **Action 1**: Complement ongoing gap analysis, gaps in wireless technologies
- **Action 2**: Continue ongoing work in the area of semantic for better data interoperability
- **Action 3**: Standards that can be used for compliance
- **Action 4**: European standard for cyber security compliance and the GDPR regulation
- **Action 5**: Development and adoption of International Reference Architecture for IoT

**RP 2017 Internet of things: achieving cruising speed**
- **Action 1**: IoT landscape and gap analysis
- **Action 2**: Establish some cooperation between SDOs, leverage results and reduce duplication
- **Action 3**: Semantic Interoperability
- **Action 4**: High Level Events

**RP 2019 Internet of things: Distilling best practices into other domains**
- **Action 1**: Complement gap analysis, wireless technologies for industrial automation
- **Action 2**: SDOs cooperation in the area of semantic for better data interoperability
- **Action 3**: Standards for compliance
- **Action 4**: Standards for cyber security and GDPR compliance
- **Action 5**: Global Reference Architecture for IoT
The Standardisation Challenges

- **Interoperability** – essential for a Digital Single Market, with seamless flow of data across sectors and value chains.
- **Chicken and egg** – supply- and demand-side are both struggling to define standards at appropriate level.
- **Innovation** – open innovation systems move fast, and the standards processes struggle to keep up.
- **Non-technical aspects** – solutions should be more than technical solutions, and take into account organisational aspects and cross domains issues.
- **Policy & Legislation** – security and privacy are still a limiting factor.
- **Acceptance** – communities are sceptical, and often with good reason.
• **Large Scale Pilots** – Innovation & Experimentation in real scale – Open calls.

• **Focus Area & Project Clusters** – Steer Convergence, joint actions chains, build momentum and leverage impact within and between Verticals.

• **AIOTI – BDVA - ECSO – ARTEMIS – 5GPP** - Stakeholder and industrial engagement in PPP

• **Open meetings and workshops** – consensus building

• **Light Steering** – channel input towards more engagement and policy governance.
Role of European partnerships: the AIOTI example

Alliance for Internet of Things Innovation

Contribute to e.g.: Digital Single Market, Digitizing European Industry, EC’s H2020 Large Scale Pilots

AIOTI WG03

- Analyze landscape
- Engage, disseminate and influence
- Identify gaps, divergences, common concerns
- Publish guidance and recommendations
- Task sub-teams to address themes

- Architecture
- Semantic Interop
- IoT Identity
- IoT impact on SG Security
- Privacy

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- SME Interests
- Distributed Ledger Technologies

- Smart Buildings and Architecture
- Smart Living Environment for Aging Well
- Smart Water Management
- Smart Manufacturing
- Smart Cities
- Smart Energy
- Smart Mobility
- Smart Farming and Food Security
- Smart Mobility

European Commission
Role of global partnerships: the OASC example

MINIMAL INTEROPERABILITY MECHANISMS (MIMs)
A roadmap based on existing standards and mechanisms, governed by cities, supported by suppliers and infrastructure providers.

140 cities in 29 countries
Global network of local networks of cities and communities
Standards-based innovation and procurement across sectors.

IoT Large-Scale Pilot on Smart Cities & Communities (15/20m€)
Set up to validate and mature the OASC MIMs at scale.
20 cities, 50 services – running on the same common technical ground.
Catalogue of validated services based on standards.
Scaling from pilots to global market

OASC is set to grow beyond the original frontrunners, and inviting all cities and countries to join.

Key events and moments include:
- **IoT Week 2019**, Aarhus, Denmark, June 17-21
- **World Economic Forum Super Cities, G20**, Osaka, Japan, June
- **SynchroniCity scale-up conference**, Milan, October 2-3
- **Smart City Expo**, Barcelona, November 19-21
- **Finnish EU Presidency**, Oulu, December 10-11 *
- **Connected Smart Cities & Communities**, Brussels, January 23, 2020
- **Cities Forum**, Porto, January 31, 2020


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**A TRUSTED ROADMAP FOR CITIES & COMMUNITIES**

The OASC Council of Cities oversees the core elements needed for interoperability across sectors.

It can be easily integrated in procurement for daily operations, as well as for innovation and even early-stage experimentation.

Gives the municipality stability and independence, which unlocks financing as well as innovation capacity.

Shares the risk of moving ahead in the digital transformation of cities & communities with peers in Europe and beyond.

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**SYNCHRONICITY**

SynchroniCity becomes part of the OASC family.

Building a growing catalogue of services and suppliers.

Ensuring try-before-you-buy-style deployment.

Based on the OASC MIM framework, and supported by mixed funding models.
The Rolling Plan on ICT Standardisation

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Cooperation & Convergence
Cross Domain/2019 RP and Beyond:

- New technical standards (cross domain)

- The next frontier is where ICT standards meet Operational Technology standards

- PPPs cooperation and joint activities (data spaces, converged reference architectures, semantic interoperability main streaming)

- Dissemination best practices across domains (eg DEI MSP WG)