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### ITU-T: Bridging the Gap: Insights into the Standards Creation Process IoT and Smart & Sustainable Cities and Communities

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### ITU – Who We Are – Our Membership



A unique platform for governments, private sector and academic institutions to build consensus on important and pressing ICT technical and regulatory issues facing our society today





### **ITU: Multi-stakeholders**

- Member States Administrations
- $\circ$  Regulators
- Private sector companies,
   e.g. operators, service providers,
   equipment manufacturers, consultancies, etc.
- Regional organizations
- International organizations
- $\circ$  NGOs
- $_{\circ}$  Research centers
- Academic institutions
- $_{\circ}$  User groups

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# ITU-T Study Group 20: Internet of things (IoT) and smart cities and communities (SC&C)







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#### **Examples of Standardization Work:**

- Y.infra, Overview of city infrastructure
- Y.SC-OpenData, Framework of open data in smart cities
- Y.ism-ssc, Technical framework for integrated sensing and management system
- Y.isw-ssc, The integrated sensor web resource metadata for smart sustainable cities
- Y.SCC-Reqts, Common requirements and capabilities of smart cities and communities from IoT and ICT perspectives
- Y.SCC-Use-Cases, Use cases of smart cities and communities





IoT Space is Huge..

Lack of Interoperability Frameworks in Specific Industry Domains





In complex systems of systems (smart cities), adopting an interoperable architecture and selecting optimal integration points to satisfy stakeholders' requirements is challenging!

Let's pick one system: 'ITS': requires the integration of many different technologies and the buy in of so many different stakeholders.



# The ITS industry standardization streams: NTCIP (C2C, C2F, F2C), DATEX II (C2C), & Urban Traffic Controllers (e.g. OCIT, SCATS, SCOOT)

Where does an LPWAN GW fits? COAP? MQTT? We need new interfaces? Platforms?







But..

# If platforms (technologies) are not endorsed or used by relevant stakeholders

They will be useless!





# United for Smart Sustainable Cities (U4SSC) – UN Initiative



U4SSC is a global platform for smart city stakeholders which advocates for public policy to encourage the use of ICTs to facilitate the transition to smart sustainable cities.

JOIN us now!



#### **Setting the Framework**

- Urban planning
- Policy, standards & regulation
- Key performance indicators



#### **Connecting Cities and Communities**

- Smart living
- Smart mobility
- Smart environment



Secretariat: Contact: <u>u4ssc@itu.int</u>

→ WG Pillar 03

#### **Enhancing Innovation & Participation**

- Smart governance
- Smart people
- Smart economy



A Virtual Meeting every month!



ITU provides a holistic approach combining technology and policy harmonization and development.







### **Standards and Innovation**

	Positive Effects on Innovation	Negative Effects on Innovation
Compatibility / Interoperability	<ul> <li>Network externalities</li> <li>Avoiding lock-in old technologies</li> <li>Increasing variety of system products</li> <li>Efficiency in supply chains</li> </ul>	<ul> <li>Monopoly power</li> <li>Lock in in old technologies in case of strong network externalities</li> </ul>
Minimum Quality/ Safety	<ul> <li>Avoiding adverse selection</li> <li>Creating trust</li> <li>Reducing transaction costs</li> </ul>	Raising rival's costs
Variety Reduction	<ul> <li>Economies of scale</li> <li>Critical mass in emerging technologies and industries</li> </ul>	<ul> <li>Reducing choice</li> <li>Market concentration</li> <li>Premature selection of technologies</li> </ul>
Information	<ul> <li>Providing codified knowledge</li> </ul>	

*Source:* The Impact of Standardization and Standards on Innovation, *Compendium of Evidence on the Effectiveness of Innovation Policy Intervention Project, 2013.* 





### **ITU-T Activities on IoT & Smart Sustainable Cities**





Development and implementation of standards

ITU-T Study Group 20



Resolution 98 Enhancing the standardization of IoT and Smart Cities and Communities for global development

**IoT4SDGs:** Considers the importance of IoT to contribute to achieving the 2030 Agenda for Sustainable Development.



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Research & pre-standardization work

Focus Group on Data Processing Management (FG-DPM)



Open platform for knowledge sharing & Forward looking research

United for Smart Sustainable Cities (U4SSC)



### ITU-T Holistic Interop Frameworks @ Different Levels of IoT/Smart City Technology Stack is done hand in hand with the Policy Dimension and International Engagements





### Takeaways: ITU-T Bridges the Gap

- Interop @ Different Levels
- Policy Enabling Instruments
- Multi-Stakeholders
- All Regions  $\leftarrow \rightarrow$  Global Standards





## Thank you

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# Q&A





# **Backup Slides**





### **Most recent approved ITU-T Recommendations**



Recommendation ITU-T Y.4114 "Specific requirements and capabilities of the IoT for Big Data".

This Recommendation complements the developments on common requirements of the IoT [ITU-T Y.2066] and functional framework of the IoT [ITU-T Y.2068] in terms of the specific requirements and capabilities that the IoT is expected to support in order to address the challenges related to Big Data.

## Recommendation ITU-T Y.4115 "Reference architecture for IoT device capability exposure".

This Recommendation specifies reference architecture of IoT device capability exposure (IoT DCE) which supports IoT applications in DCE devices (e.g., smart phones, tablets and home gateways) to access device capabilities exposed by IoT devices connected to the DCE device.

Recommendation ITU-T Y.4805 "Identifier service requirements for the interoperability of Smart City applications".

This Recommendation explores the set of requirements for identifier services used in Smart City. An identifier service for Smart City must be scalable and secure, and not only promote interoperability among different Smart City applications, but also compatible with any existing practices in the application domain.





