Policy Webinar on
Standardization and its impacts on EU/US ICT collaboration

Friday, September 29th, 2017

15:00-16:30 (UTC)

The event is free of charge
Registration is required at:
www.picasso-project.eu

ICT Policy, Research and Innovation for a Smart Society

PICASSO has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 687874.

Standardization and its impact on EU-US ICT collaboration
Webinar Objectives

- With the webinar on **" Standardization and its impacts on EU/US ICT collaboration"**, PICASSO will bring forward policy recommendations designed to improve EU/US ICT-orientated collaborations - specifically in the technological domains associated with 5G networks, Big Data, and IoT/CPS.

- Different approaches towards standardization in the USA and in Europe will be taken into account.

- The participatory webinar will discuss the draft briefing paper, which is available at: http://www.picasso-project.eu/wp-content/uploads/2017/09/20170212-PICASSO-Policy-Paper-3-Standards-DRAFT-v09.pdf

- The validated Policy Brief will be available one week after the webinar.

Project in brief

> **Coordination and Support Action**, funded by the European Commission/DG CONNECT

> **Duration:** January 1, 2016 - June 30, 2018

> **Target groups:** industry, government and civil society actors involved with ICT research and innovation development and policy

> **Target regions:** European Union, United States of America

> **Key Message:** ICT research and innovation (R&I) collaboration between the EU and the US can help it to reflect socioeconomic and technological realities and to improve the contributions of ICT development and policy to enhancing economic growth and reconciling industrial needs with societal objectives.

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EU-US ICT collaboration

PICASSO priorities at the heart of EU policy orientations

"On its Strategy to create a Digital Single Market and digitise European industry, the European Commission focuses on accelerate standard setting and related enabling technologies, such as 5G, cloud computing, internet of things, data technologies and cybersecurity."

Andrus Ansip , Vice-President EC for Digital Single Market
Günther Oettinger, Commissioner for Digital Economy and Society

PICASSO focusses on synergies between ICT *policies* and ICT *technologies* to:

> reinforce EU-US collaboration in pre-competitive ICT R&I in key enabling technologies with the greatest promise in meeting societal challenges: **5G Networks, Big Data and Internet of Things (focus on Cyber Physical Systems)**

> support EU-US ICT policy dialogue by creating a forum for discussion and contributing to policy debate regarding **privacy, security, internet governance, interoperability and ethics**.

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Expert Groups

Synergies between policy and technology groups

3 Technology Groups
Strategic ICT Technology areas linked to Societal Challenges

5G Networks

Big Data

IoT/CPS

1 Horizontal Group
On ICT Policy linked to key ICT technology areas

Policy issues:
Privacy and data protection | Security | Standards and Interoperability | Ethics …

+25 Experts in total across all groups

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How to Participate

An Overview of the Adobe Connect System

Marta Calderaro

H2020 ICT NCP, APRE, Italy

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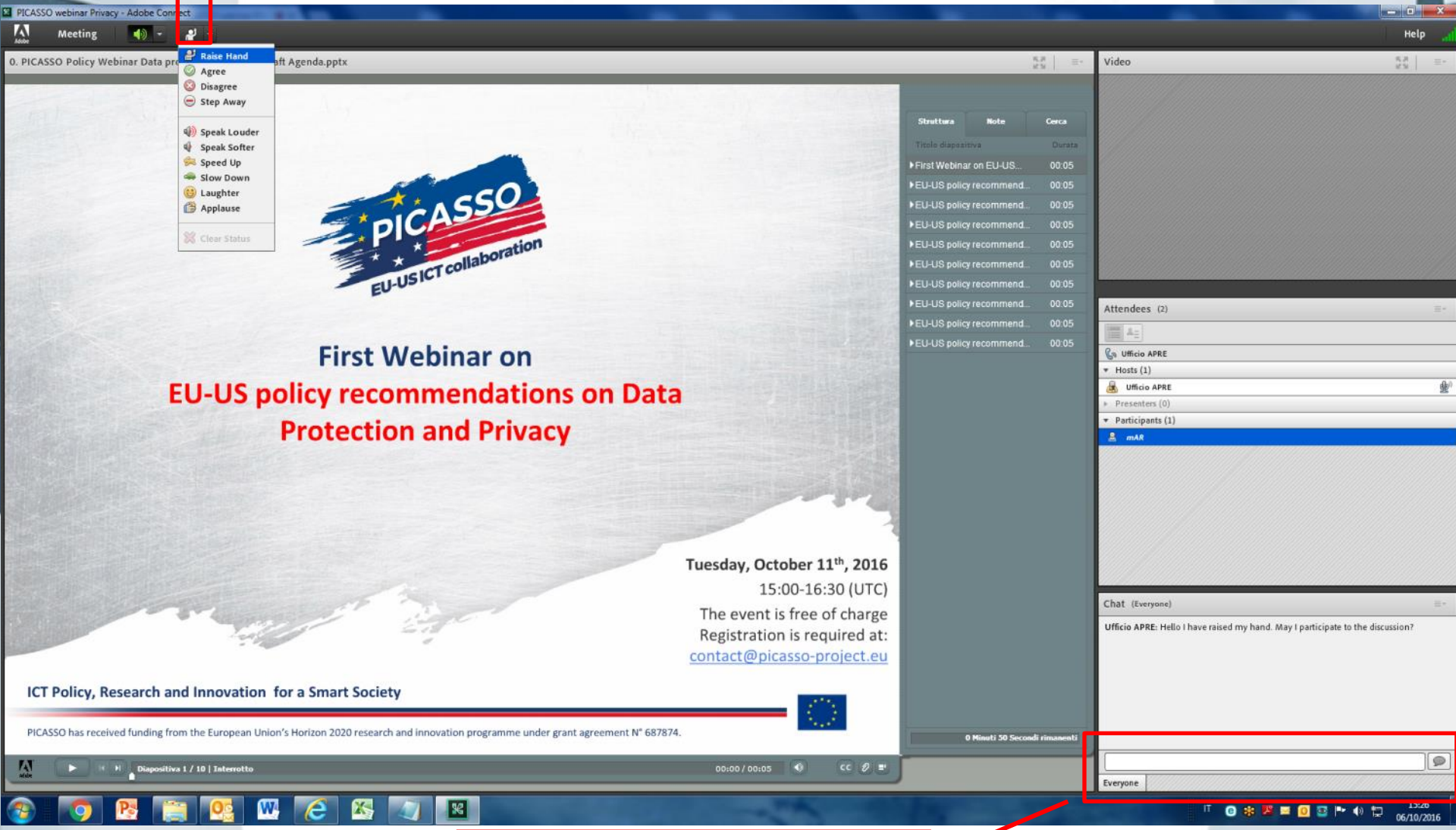
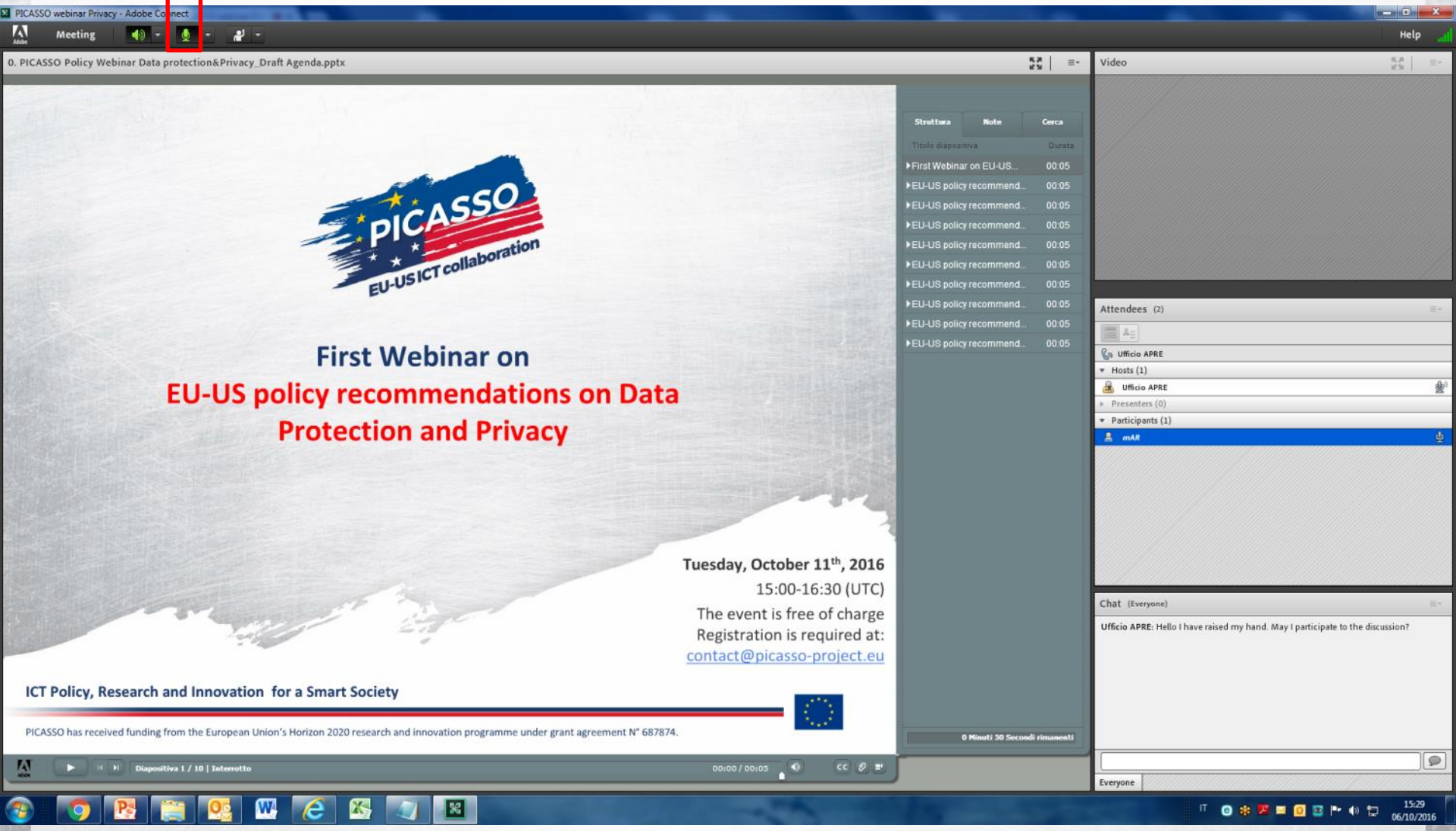
By raising your hand, you will be able to contribute to the discussion. The Host will receive your kind request and allow you to talk.



You will be able also to contribute to the discussion via Chat.

After be enabled to talk by the Host, make sure your microphone is enabled (in green). If needed, adjust the microphone's volume.



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Standardization and its impact on EU-US ICT collaboration: fundamental approaches and developments

Scoping the issue

Maarten Botterman
Chairman of PICASSO ICT Policy Expert Group

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ICT has become part of almost everything we do and use, and is implemented in many different sectors.

Standardisation in ICT related domains are GLOBAL, FAST DEVELOPING, and mostly VOLUNTARY.

Hypothesis for this webinar: ***stimulate participation of sponsored research and innovation in global standardisation platforms rather than at regional level.***

STANDARDS ARE NOT WHAT THEY USED TO BE

Standardization and its impact on EU-US ICT collaboration

Agenda – Friday, September 29, 2017 – 15:00 - 16:30 (UTC)

- **PICASSO Welcome and purpose of the call**
  Maarten Botterman, PICASSO Policy Expert Group Chairman
- **Introduction to EU-US Standardization policy issues relating to ICT development**
  Jonathan Cave, GNKS Consult and University of Warwick

Participatory discussion: current status and expected development in EU and US

- **Key contribution from:**
  Olaf Kolkman, ISOC Chief Internet Technology Officer
  Chris Greer, Senior Executive, NIST
- **Three domains focus - 5G, Big Data, IoT/CPS**
  PICASSO 5G Networks Expert Group – Yaning Zou
  PICASSO Big Data Expert Group – Prof Ray Walshe
  PICASSO IoT/CPS Expert Group – Christian Sonntag

Introduction and Participatory discussion: Focus per domain on standardization issues and its affections to EU-US collaboration

- **Preliminary conclusions (Briefing Document validation)**

Introduction to EU-US ICT Standardisation policy issues relating to ICT development

Dr. Jonathan Cave

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Issues affecting ICT standaridisation

- ICT spread often regarded as *convergence*, which creates pressure on existing standards and need for new, consistent and wider basis for standards development
  - Cannot always extend narrower standards which embed domain-specific views of e.g. security, privacy, performance
  - Risk of race to bottom, gold-plating, tipping into dominance
  - Convergence cannot be assumed; fragmentation is a real possibility
  - How far 'up the stack' should standards-based solutions be sought?
- New forms of collaboration may be necessary to
  - Secure a vast, connected, sustainable virtual agora
  - Enhance competition
  - Can foster non-market cooperation
  - Helps to detect and tackle problems before they are obvious and irreversible

Drivers and practice of standardisation

- Cultural
  - Curiosity and interest in ‘what works’ to solve common problems
  - Tensions among commercial, scientific, civil society communities
- Social
  - Contact, communication and awareness -> interoperability
  - Awareness of non-neutrality of technical standards
  - Protecting human rights imperatives
- Technological
  - Stability and function of the Internet in face of BYO X
  - Network effects – excess volatility and inertia
  - Standards ecosystems
- Practice
  - Principles – openness, consensus, transparency
  - Permissionless innovation, open standards
  - Changing nature and system of SDOs

EU/US perspectives

- Governments
  - Co-regulatory stance, contaminated by economic interest
  - Some MS very active; national bodies, research links, participation in international SDOs
  - Complementary coverage of issues and interests
- EU
  - Harmonisation of DSM through R&I, procurement
  - Standards links in Procurement Directives (EU or MS standards)
  - Open standards regulations, ICT standardisation plan, MSP and Joint Initiative
  - WTO-like objectives
- US
  - Development – NIST, OMB Circular A-119
  - Enforcement – DoJ, FCC, FTC
  - Consumer – DoD
  - Objectives: timely, relevant, cost-effective; consistent with policy; innovation and competition

Some hot areas

- Privacy shield, GDPR, etc.
- Trade agreement
- Standards arrangements underpinning joint research
- Cross-border procurement

Perspectives on ICT Standardization

Olaf Kolkman

ISOC Chief Internet Technology Officer

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3 things

- The rolling plan, providing a European perspective
- Horizontals and verticals
- Specs and code

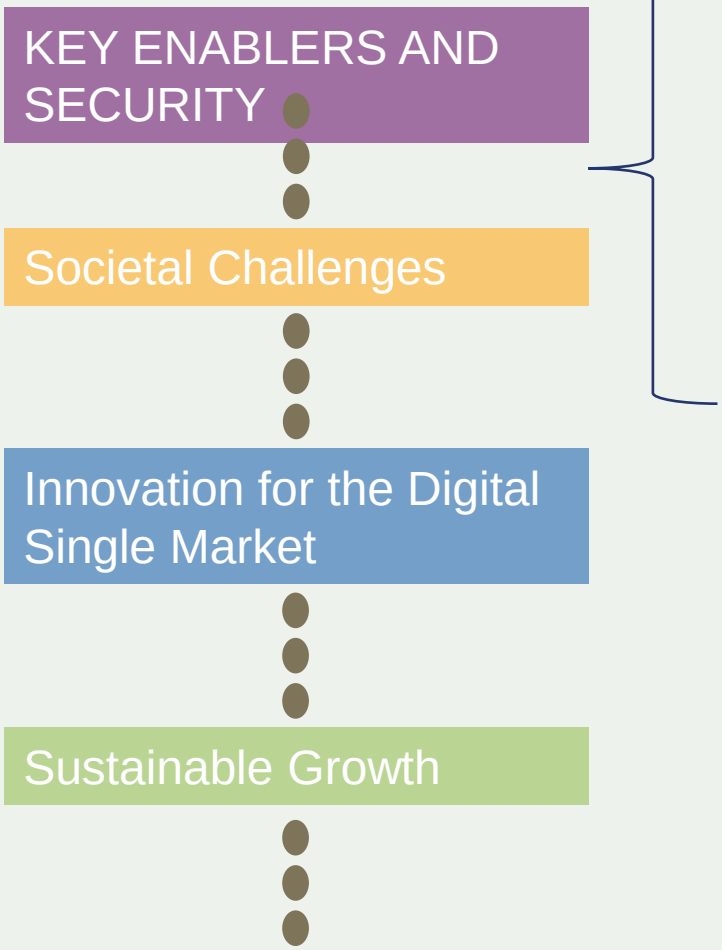
A European Perspective: The Rolling Plan

Developed by the EU MSP on ICT Standardisation

Provides a multi-annual overview of the needs for preliminary or complementary ICT standardisation activities in support of the EU policy activities

https://ec.europa.eu/digital-single-market/en/news/rolling-plan-ict-standardisation-0

How to digest….



POLICY OBJECTIVES

LEGISLATION AND POLICY DOCUMENTS

PROPOSED NEW ACTIONS ON STANDARDISATION

STANDARDISATION NEEDS, ONGOING ACTIVITIES AND PROGRESS REPORT

KEY ENABLERS AND SECURITY

- 5G (*new*)
- Cloud computing
- Public sector information, open data and big data
- Internet of things
- Network and information security
- ePrivacy
- eInfrastructures for research data and computing-intensive
- science
- Broadband infrastructure mapping
- Electronic identi cation and trust services including e-signatures

Societal Challenges

- eHealth
- Active and healthy ageing
- Accessibility of ICT products and services
- e-Skills and e-Learning
- Emergency communications
- eCall
- eGovernment

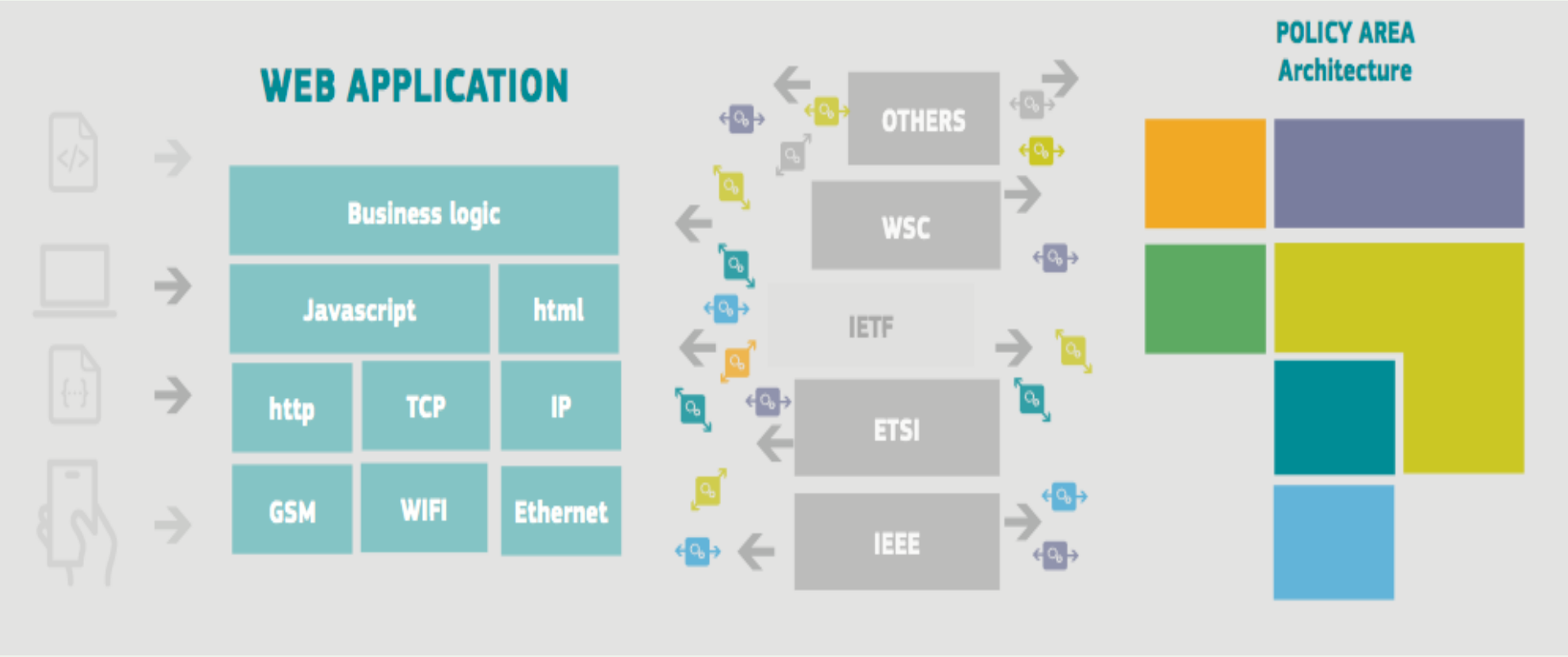
Innovation for the Digital Single Market

- e-Procurement, pre and post award
- e-Invoicing
- Card, mobile and internet payments
- XBRL
- Preservation of digital cinema

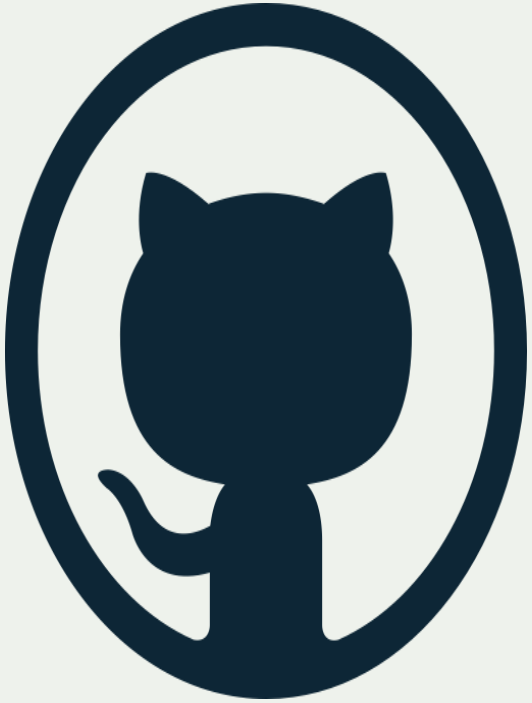
Sustainable Growth

- Smart grids and smart metering, smart and e cient energy use
- Smart cities and communities, aggregating smart services and
- technologies in urban areas
- ICT environmental impact
- European electronic toll service (EETS)
- Intelligent transport systems (ITS)
- Advanced manufacturing
- Robotics and autonomous systems
- Construction — building information modelling (*new*)
- Common information sharing environment (CISE) for EU
- maritime domain (*new*)

How about the horizontals



Specs or Code



Perspectives on ICT Standardization

Dr. Chris Greer
Senior Executive for Cyber Physical Systems, US National Institute of Standards and Technology

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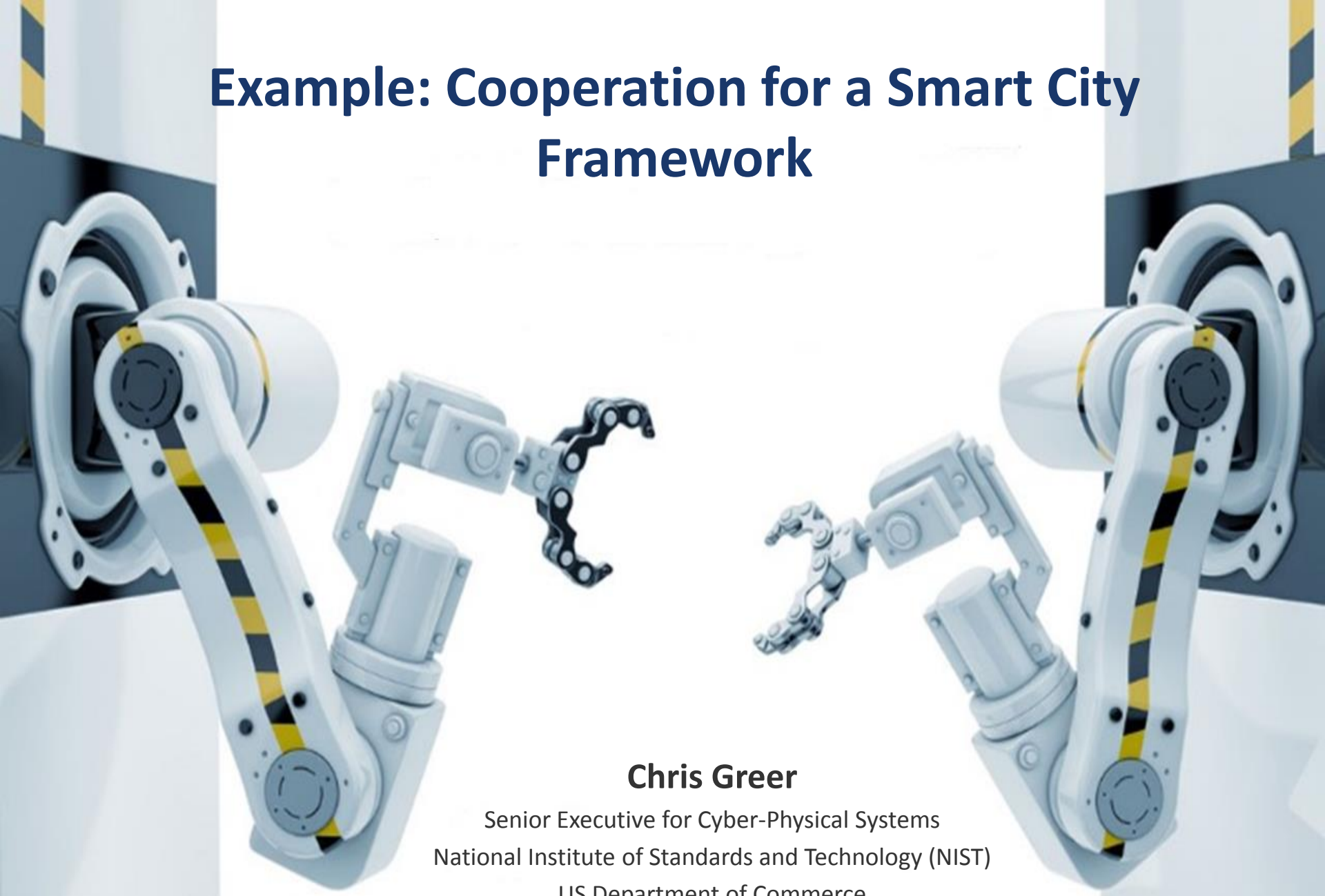
Example: Cooperation for a Smart City Framework



Chris Greer

Senior Executive for Cyber-Physical Systems

National Institute of Standards and Technology (NIST)

US Department of Commerce

Internet of Things-Enabled Smart (IES) City Framework

- IES-City ("Yes-City") Int'l Working Group
  NIST and its partners have convened a public working group to distill a common set of smart city architectural features and to identify "Pivotal Points of Interoperability"
  - 3 working groups, collaboration site: https://pages.nist.gov/smartcitiesarchitecture/
  - Completion in fall 2017

Pivotal Points of Interoperability - PPI

- If you standardize everything, you freeze out innovation.
- If you standardize nothing, you get non-interoperable clusters that can't be easily integrated.

⌘ The principle of Pivotal Points of Interoperability is to find consensus standardized interfaces that deal with composition of CPS without constraining innovation.

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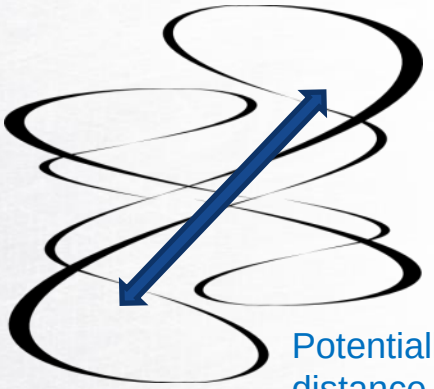
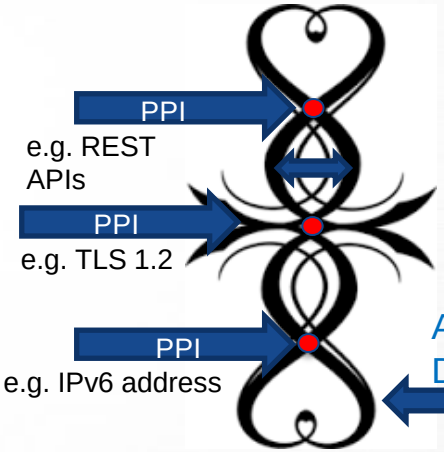
Pivotal Points of Interoperability (PPI)

Independent technology deployments



Potentially large distance to interoperability

With Pivotal Points of Interoperability

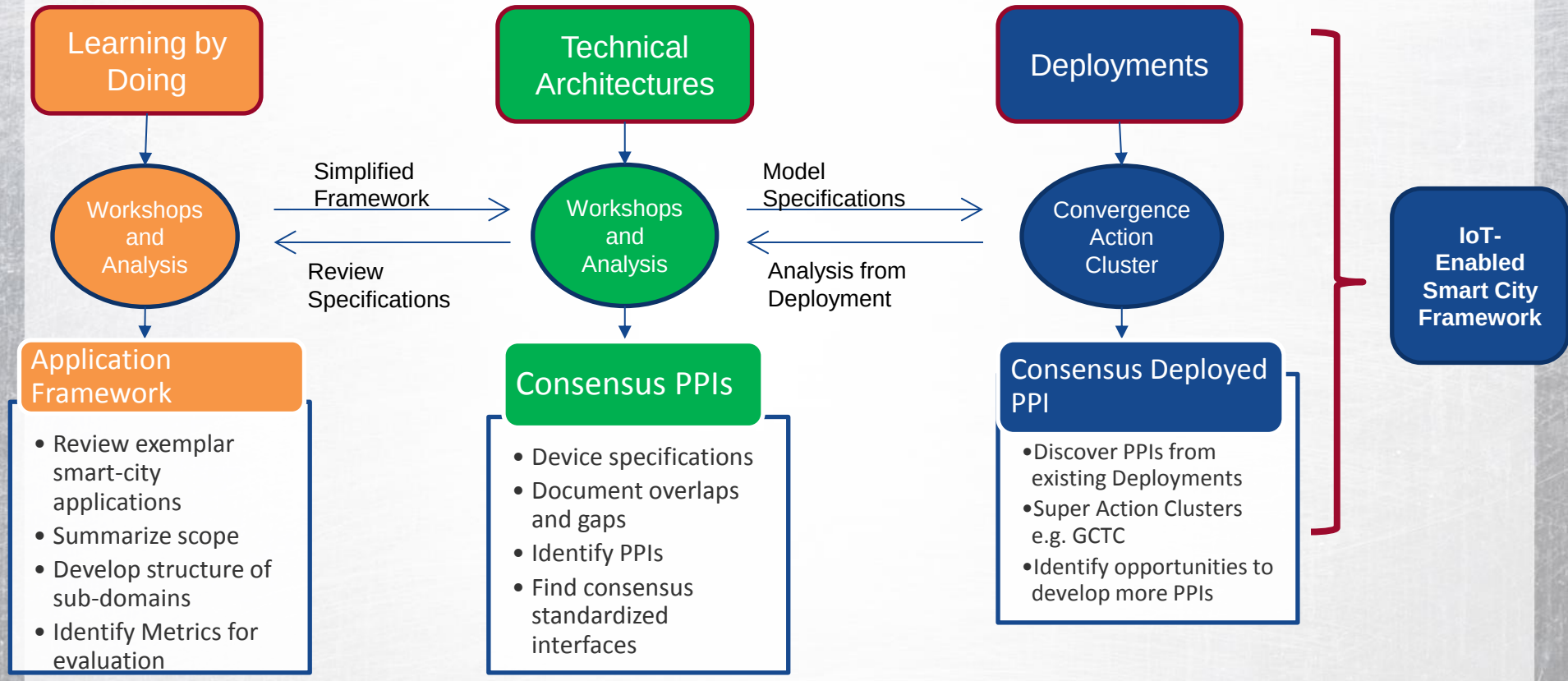


Minimize distance to interoperability

e.g. Convert XML to JSON

Application Diversity

Public Working Groups



Participants: City CTOs, Experts, Companies, Technical Stakeholders, …

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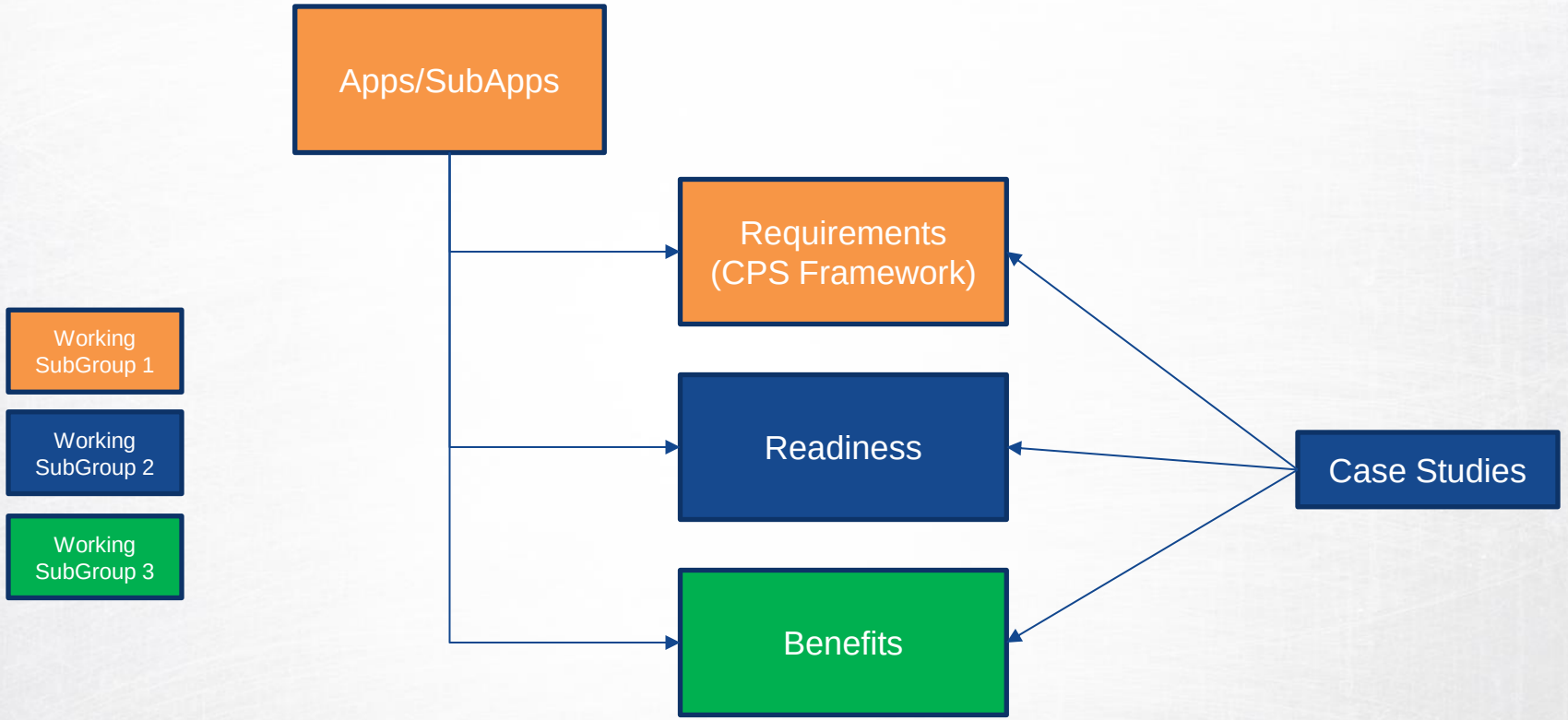
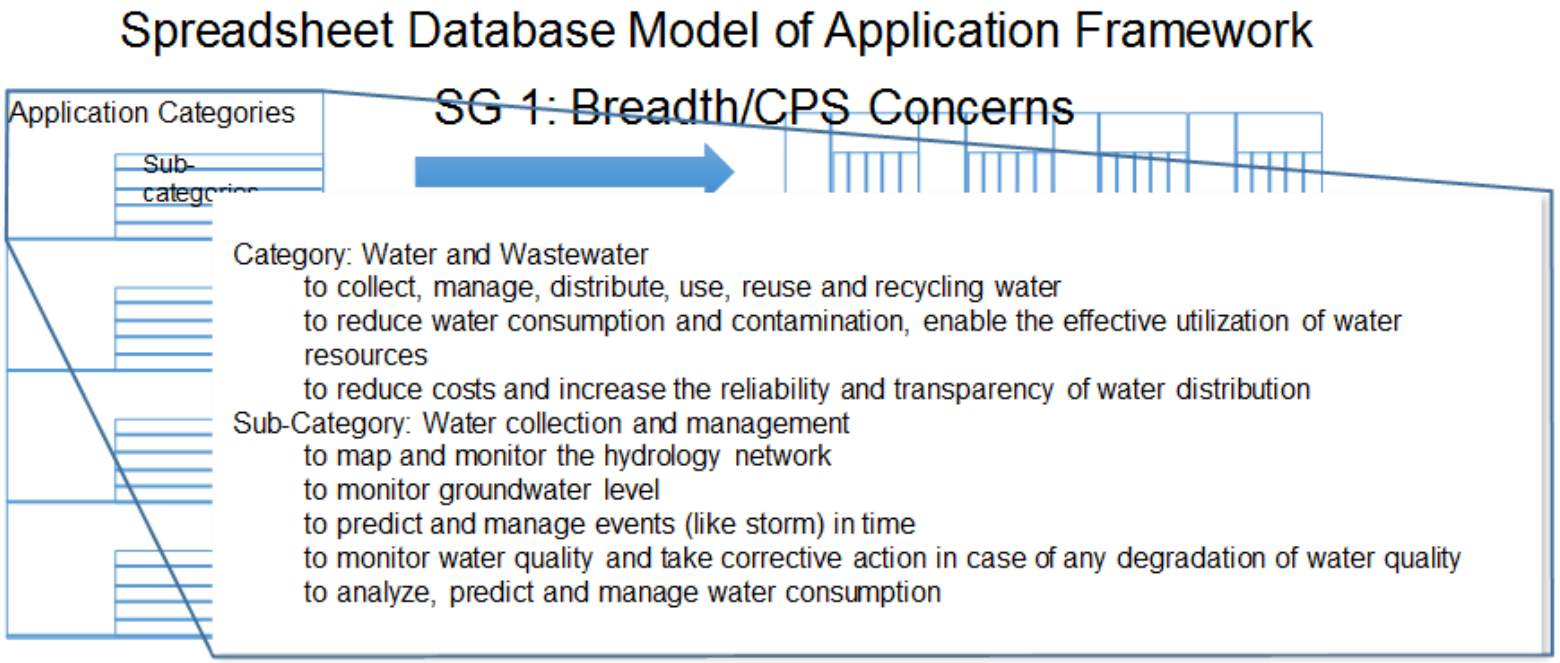
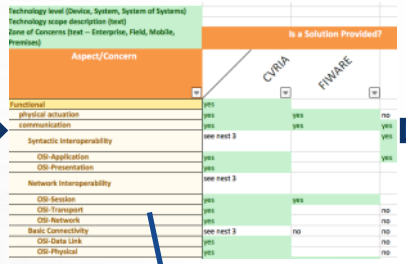
Application Framework Model



Application Framework Data Analysis



Consensus PPI



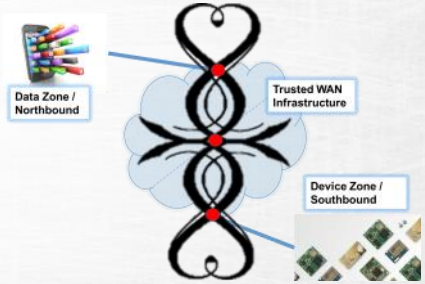
Potential PPI

Services

Zone of Concerns = bundles of services that address a "vector" of concerns

Simplified by Aspects and Concerns

Complex Specifications and Architectures



What factors enabled this collaboration?

- Lightweight agreements
- Participant's secure their own resources
- Virtual meetings
- Open documents
- Voluntary, consensus-based approach
- Focus on existing technologies and deployments
- Technology and business-model neutral

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5G: key developments and relation with Standardization

Yaning Zou
Manager of PICASSO 5G Networks Expert Group

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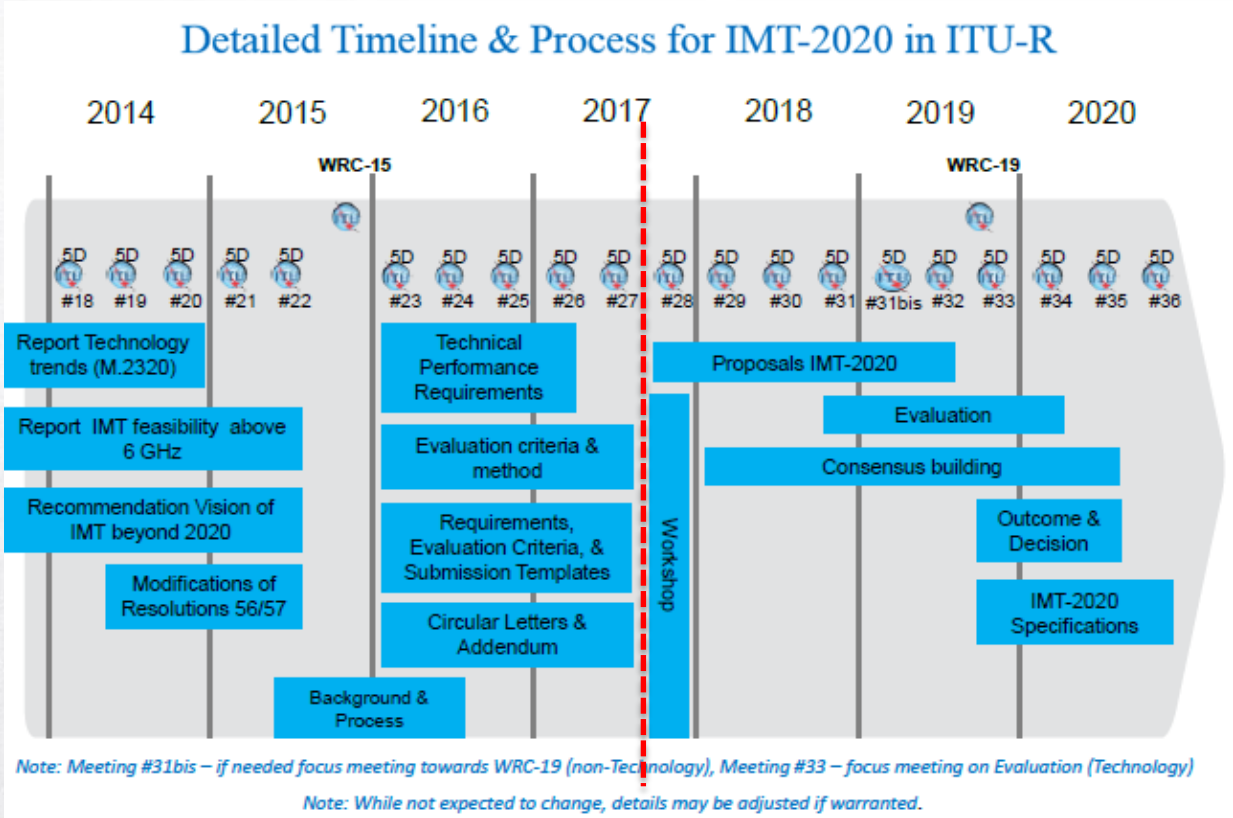
ITU-R Roadmap on 5G



We are here!

[1] http://www.itu.int/en/ITU-R/study-groups/rsg5/rwp5d/imt-2020/Pages/default.aspx

3GPP roadmap towards IMT-2020

Targeted action towards IMT-2020

- Initial technology submission to ITU-R WP5D meeting #32, Jun. 2019.
- Detailed specification submission to ITU-R WP5D meeting #36, Oct. 2020.

5G Spectrum

- 5G Phase 1: 0.4GHz ~50GHz
- 5G Phase 2: ~50GHz ~100GHz

Finished 5G RAN study

- Scenarios and requirements for next generation access technologies (Dec. 2016)
- Channel model for frequency spectrum above 6 GHz (Jun. 2016)
- New radio access technology (Jun. 2017)

Finished 5G SA study

- New services and markets technology enabler (Jun. 2016)
- Architecture and security for next generation system (Sep. 2016)

[2] http://www.netmanias.com/en/post/oneshot/11147/5g/timeline-of-5g-standardization-in-itu-r-and-3gpp

[3] http://www.3gpp.org

Other Major Standardization Activities

IEEE 5G Standardization

- Working group was established on Dec. 2016
- Sponsored by 7 IEEE Societies
  - IEEE computer society, IEEE Communication Society, IEEE Antennas and Propagation Society, IEEE Instrumentation and Measurement Society, IEEE Microwave Theory and Techniques, IEEE Vehicular Technology Society, International Committee on Electromagnetic Safety
- Prominent Standards working groups, e.g.,
  - IEEE 802.11 WLAN working group (e.g. IEEE 802.1ad and IEEE 802.11p)
  - IEEE P1918.1 Tactile Internet working group

IETF Standardization

- Technical areas
  - Internet, Routing, Ops & Management, Transport, Apps & Real time, Security
- Essential for 5G, e.g.,
  - Change IP protocols/routing to support network virtualization
  - Improve HTTPS protocols for better efficiency and security.
- Close collaboration with 3GPP
  - 3GPP is committed to not duplicate IETF functionality, but to re-use IETF standards

Standardization: Policy Challenges for the Big Data

Ray Walshe

Member of PICASSO Big Data Expert Group

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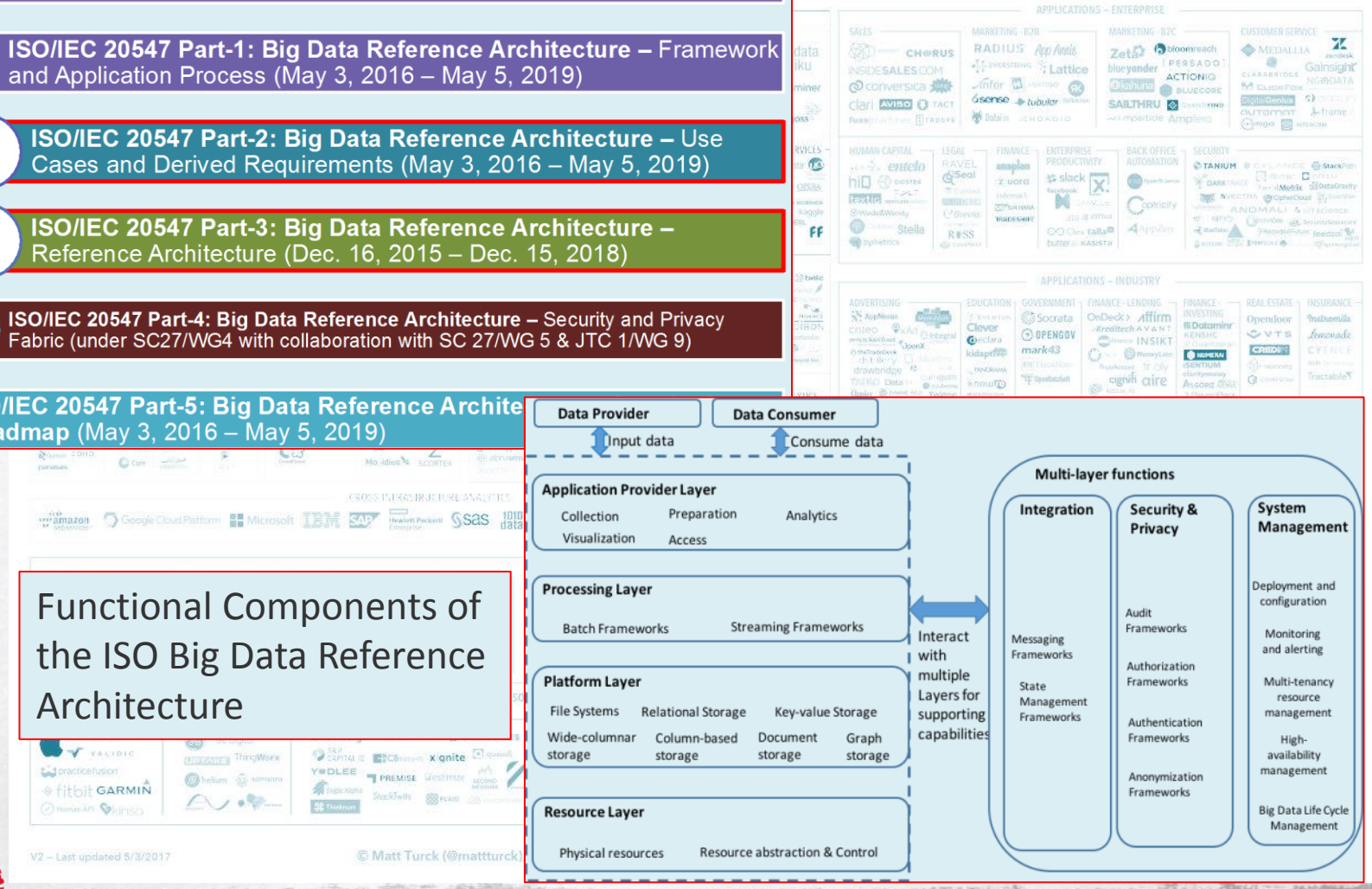
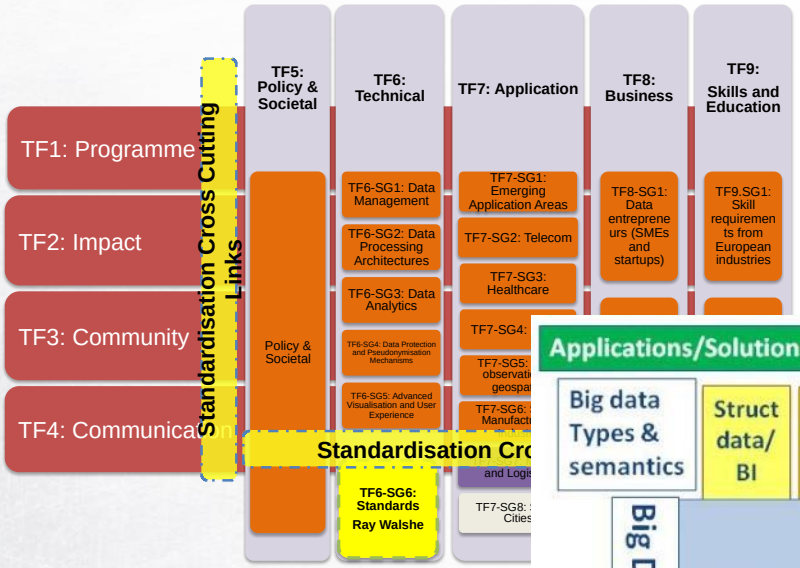
ISO IEC JTC1 WG9 Big Data Reference Architecture

- **ISO/IEC 20546: Big Data – Overview and Vocabulary** (Dec. 16, 2015 – Oct. 9, 2018)
- **ISO/IEC 20547 Part-1: Big Data Reference Architecture –** Framework and Application Process (May 3, 2016 – May 5, 2019)
- **ISO/IEC 20547 Part-2: Big Data Reference Architecture –** Use Cases and Derived Requirements (May 3, 2016 – May 5, 2019)
- **ISO/IEC 20547 Part-3: Big Data Reference Architecture –** Reference Architecture (Dec. 16, 2015 – Dec. 15, 2018)
- **ISO/IEC 20547 Part-4: Big Data Reference Architecture –** Security and Privacy Fabric (under SC27/WG4 with collaboration with SC 27/WG 5 & JTC 1/WG 9)
- **ISO/IEC 20547 Part-5: Big Data Reference Archite… Roadmap** (May 3, 2016 – May 5, 2019)



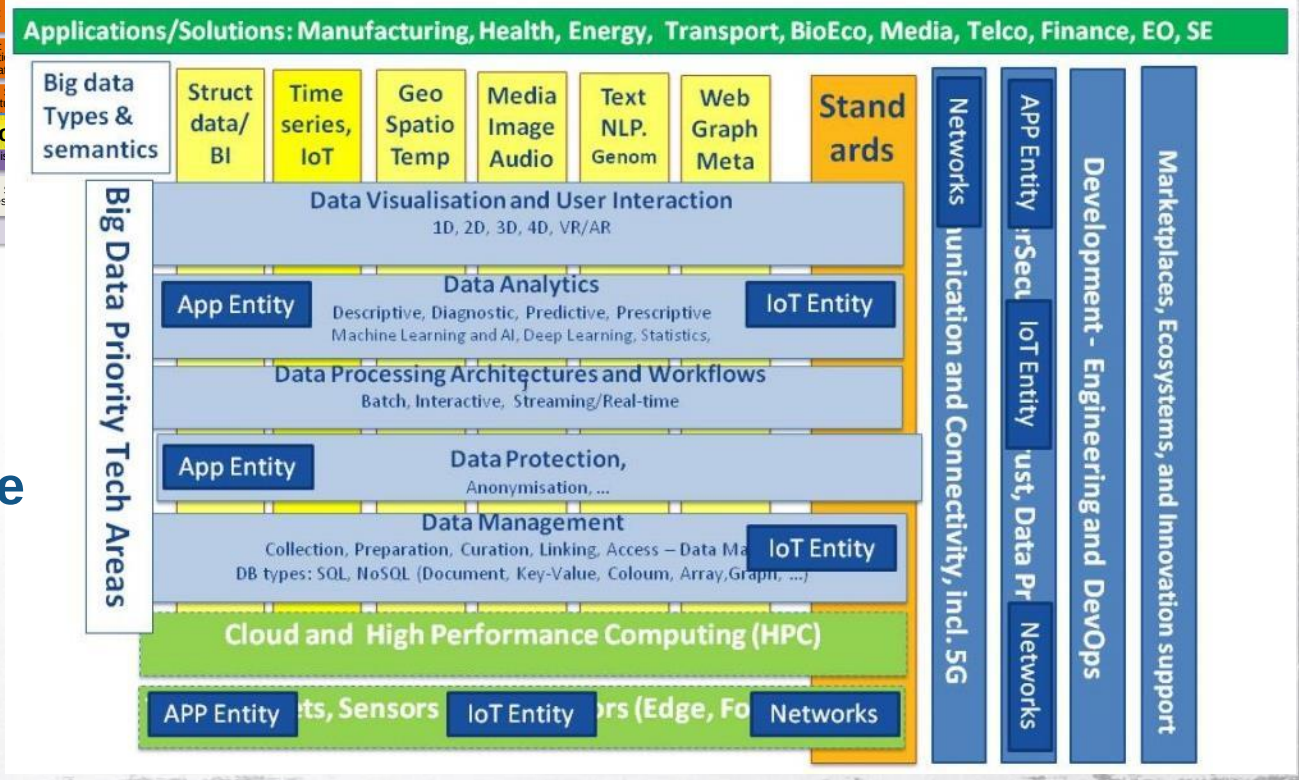
Functional Components of the ISO Big Data Reference Architecture

Big Data Value Association (BDVA) TF6SG6



BDV TASK FORCES

BDV Big Data Reference Model



Ray.Walshe@DCU.ie

International Workshop on Big Data Standardization

5TH INTERNATIONAL WORKSHOP ON BIG DATA 14-AUG-2

AGENDA

08:30 - 09:15 **Coffee + Registration**
09:15 - 09:30 Welcome
Ray Walshe CHAIR of IWBD
Enda McDonnell, Director
09:30 - 09:45 Official Opening
Adrienne Harrington
Head of Data Protection Uni
Irish Government Dept. of a
09:45 - 10:00 Special Guest
Daniele Rizzi - EC DG CNEC
European Standardisation
Session 1
10:00 - 10:25 **Wo Chang** - ISO IEC JTC1 W
ISO Big Data Reference Arc
10:30 - 10:55 **Wael Diab** - HUAWEI / IIC /
Big Data Ecosystem
11:00 - 11:30 Coffee and Networking
Session 2
11:30 - 11:55 **Ashok Ganesh** - CEN CENE
Future Industry Standardisation
12:00 - 12:30 **Arne J Berre** - TF6 LEAD BDVA
BDVA Standardisation
12:30 - 13:30 LUNCH
Session 3
13:30 - 13:55 **Rigo Wenning** - W3C
Big Data Europe -Data Engine
14:00 - 14:25 **Ingo Simonis** - OPEN GEOSPATION CONSORTIUM
Standardized Geospatial Big Data
14:30 - 14:55 **Georgios Karagiannis** - AIOTI
WG3 AIOTI Standardisation
15:00 - 15:30 Panel Session
Ray Walshe (Insight@DCU)
Daniele Rizzi (European Commission)
Wo Chang (NIST / IEEE-SA)
Ana Garcia (Big Data Value Association)
Thomas Hahn (OPC Foundation)
15:30 - 15:45 Final Remarks
15:45 - 16:30 Close of Workshop and Networking

NSAI BDV BIG DATA VALUE ASSOCIATION ISO

IWBDS'17

International Workshop on Big Data Standardisation

14th Aug 2017 @ Dublin City University

5TH INTERNATIONAL WORKSHOP ON BIG DATA DUBLIN IRELAND 14TH AUG 2017

https://wbds17.eventbrite.ie

COLLABORA

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Ray.Walshe@DCU.ie

Standardization: Policy Challenges for the Internet of Things (IoT) and Cyber-physical Systems (CPS)

Christian Sonntag

Manager of PICASSO IoT/CPS Expert Group

ICT Policy, Research and Innovation for a Smart Society

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Convergence of IoT and CPS: IoT-enabled CPS

- **Focus of current research and development in IoT**
  - Low-cost sensors / computing, connectivity, middleware → **enormous amounts of data can be collected**
- **How to make use of the data is often not clear**
  - What benefits can be gained from the data
  - **Challenge: From sensing to actuation, closing the loop**

→ **IoT is an enabling technology for CPS**

- **Cyber-physical systems are often embedded in large systems consisting of many coupled components with partial autonomy**
  → **Cyber-physical Systems of Systems (CPSoS)**

See also www.cpsos.eu

  - E.g. power grids, oil and gas pipelines, commercial buildings, transportation systems, production sites, and other complex, critical infrastructures

Interoperability as a Key Challenge in IoT/CPS

- **Interoperability and integration are key challenges for the IoT/CPS in the EU and the US**
  - Semantic interoperability and semantic models, plug-and-play integration
  - IoT and CPS architectures and cross-domain infrastructures
  - Open platforms, joint testbeds and large-scale pilots
  - Heterogeneous modeling, open formalisms, simulator interoperability
- **Crucially important in all analyzed application sectors**
  - **Smart production:** Interoperability of thousands of cyber- and physical components, global real-time access, value-chain integration
  - **Smart energy:** Harmonization of grids and value chains
  - **Smart Transportation:** Interoperability between heterogeneous transportation systems (e.g. EV charging, V2V, V2I, air traffic management, maritime systems), supply chain integration
  - **Smart Cities:** Interoperability to enable smart functionalities

Interoperability Efforts and Challenges

- **Standardization and reference architectures for the IoT/CPS domains**
  - A vast number of standardization efforts are under way for IoT protocols and interoperability (https://www.postscapes.com/internet-of-things-protocols/)
  - (I)IoT and CPS interoperability efforts and reference architectures
    - ★ EU: AIOTI/IERC, Industry 4.0, ECSEL JU, ARTEMIS IA, FIWare, …
    - ★ US: NIST IoT/CPS Framework, IIC, Allseen Alliance, Open Connectivity Foundation, FERC, …
- **Main challenge: Harmonization of interoperability standards between the US and the EU**
  - IoT-enabled CPS are international infrastructures, standards define future markets
- **Needed: Initiatives to promote joint experiments and infrastructure sharing**
  - Joint work on international standards / interoperability is easier than cooperation on topics of high commercial importance

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- Discover information on existing collaborative initiatives
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Consortium

Coordinator
inno TSD, France

Technische Universitat Dortmind (TUDO), Germany

THHINK Wireless Technologies Limited (THHINK), United Kingdom

Athens Technology Center (ATC), Greece

Agency for the Promotion of the European Research (APRE), Italy

Honeywell International INC (HON), United States

GNKS Consult BV, (GNKS), The Netherlands

Technische Universitaet Dresden (TUD), Germany

Florida International University, (FIU), United States

Regents of Univeresity of Minnesota, (TLI), United States

PICASSO EU-US ICT collaboration

Contacts

Policy Expert Group Chairman: **Maarten Botterman,** GNKS Consult BV
maarten@gnksconsult.com

Project Coordinator: **Svetlana Klessova,** inno TSD, France
s.klessova@inno-group.com

More on Picasso

www.picasso-project.eu

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