#DigitiseEU

Digitising European Industry
EU Level Activities
in Support of Industry Digitisation

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Realising Europe's Industrial Potential
What is Europe Doing?

- EU is supporting transformation of manufacturing through FACTORIES of the FUTURE (FoF) partnership

- €1.15 billion programme within Horizon 2020

- 250+ projects

- 2,500+ organisations participating

- 60% industrial participation

- >30% of funding to SMEs

- National & regional initiatives align with FoF Roadmap

- A.I. to feature in future call topic(s) – watch this space!

EFFRA
EUROPEAN FACTORIES OF THE FUTURE
RESEARCH ASSOCIATION

Digitising Industry

| Momentum | Challenges |

Digitising European Industry Initiative

| European Platform of National Initiatives | DIHs | Partnerships & Industrial Platforms | Regulatory framework | Skills & Jobs |

Strengthening leadership

| Partnerships | Industrial Platforms | Standardisation | H2020 and beyond |

"We should make the EU the ideal home for enterprises and innovators in the digital age."
Prime Minister of Estonia

"Standardisation is key for fostering the development of the next-generation digital industrial platforms. "

Report available

High-level governance meeting of the European platform of national initiatives on digitising industry

21 November 2017

Digitising European Industry
Second Stakeholder Forum

27-28 March 2018, Villepinte, Paris

#DEIforum #DigitiseEU @DigIndEU

MINISTÈRE DE L'ÉCONOMIE ET DES FINANCES

"B2B platforms are the next battle Europe cannot afford to lose"

Enterprises with High levels of Digital Intensity, by Economic sectors (17 Nace groups)
Year:2016

Legend
- Manufacture: food, beverages, tobacco, textile, leather, wood, paper; publishing and printing 10+
- Manufacture: coke, petroleum, chemical, plastics, other non−metallic mineral products 10+
- Manufacture: basic metals & fabricated metal products excluding machines & equipments 10+
- Manufacture: computers, electric & optical, motor vehicles, transport equipment, furniture, repair 10+
- Electricity, gas, steam, air conditioning; water supply, sewerage, waste management&remediation 10+
- Construction 10+
- Trade of motor vehicles and motorcycles 10+
- Wholesale trade, except of motor vehicles and motorcycles 10+
- Retail trade, except of motor vehicles and motorcycles 10+
- Transport and storage 10+

56% of companies in computer programming, consultancy and information services are highly digitised.
Only around 6% of companies in basic metals & fabricated metal products excluding machines & equipment are highly digitised.

Enterprises with High levels of Digital Intensity
Year:2016

53% of Danish companies are highly digitised vs 8% in Bulgaria and Romania

Enterprises with High levels of Digital Intensity, by Enterprise size (Small, Medium, Large)
Year:2016

Legend
- Small enterprises (10–49 persons employed), without financial sector
- Medium enterprises (50–249 persons employed), without financial sector
- Large enterprises (250 persons employed or more), without financial sector

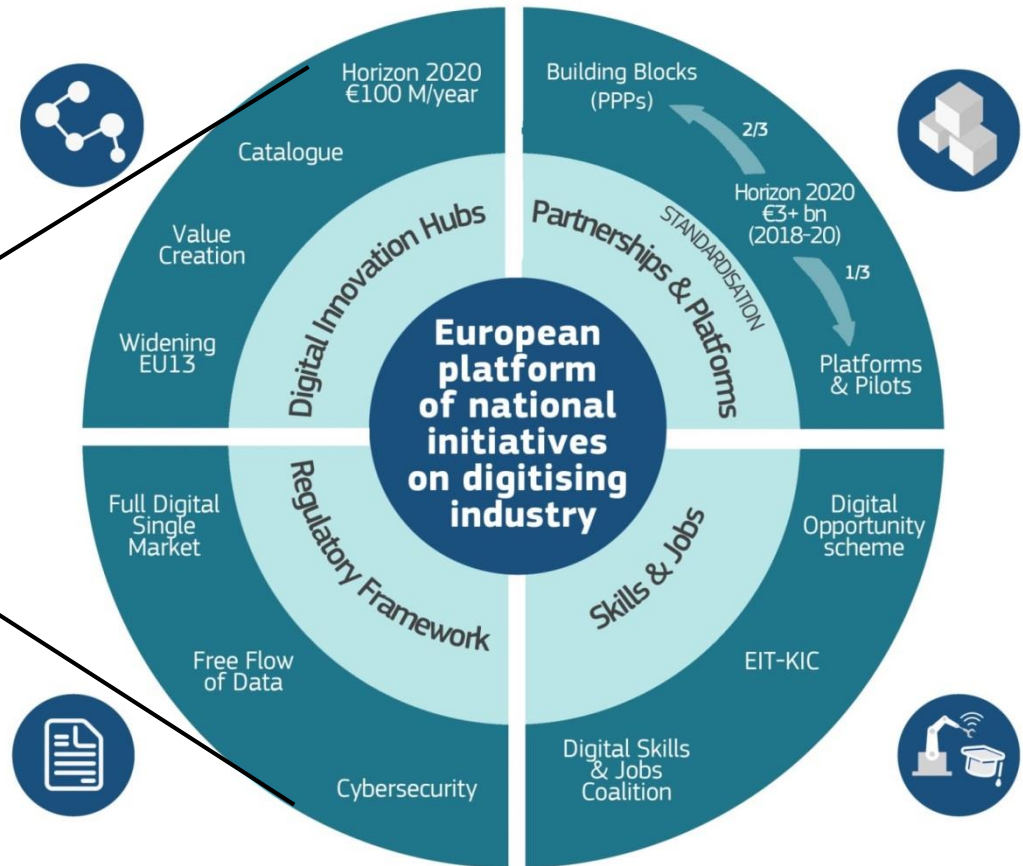42% of large companies is highly digitised in the EU vs 16% of SMEs

European Commission, Digital Scoreboard

5

European Commission

Industrial Strategy
for Europe
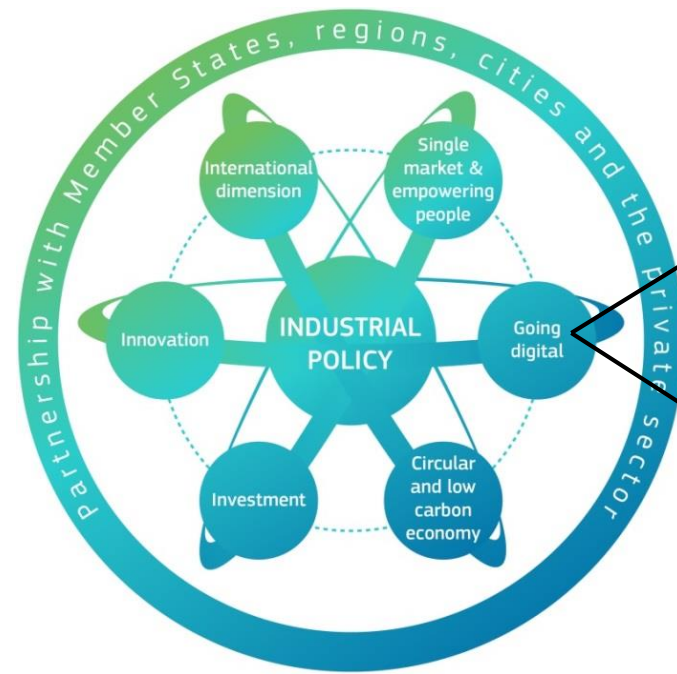
Digitising European Industry
Part of the Digital Single Market Policy

September 2017

April 2016:
Strong Delivery
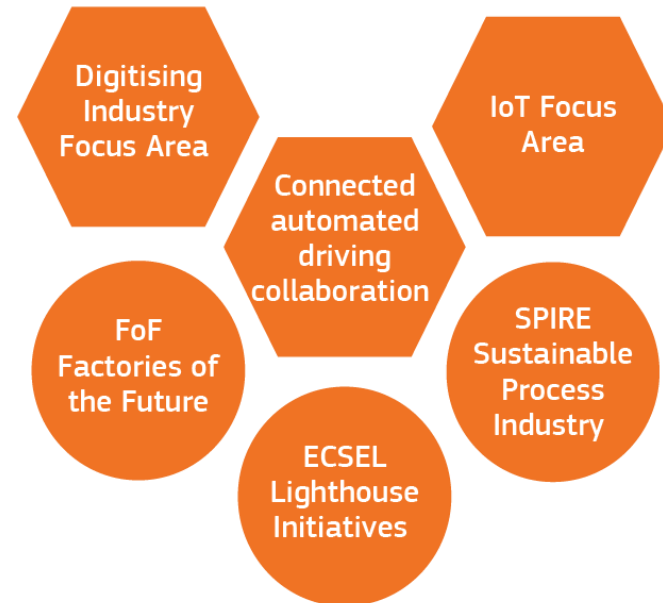
DEI priorities
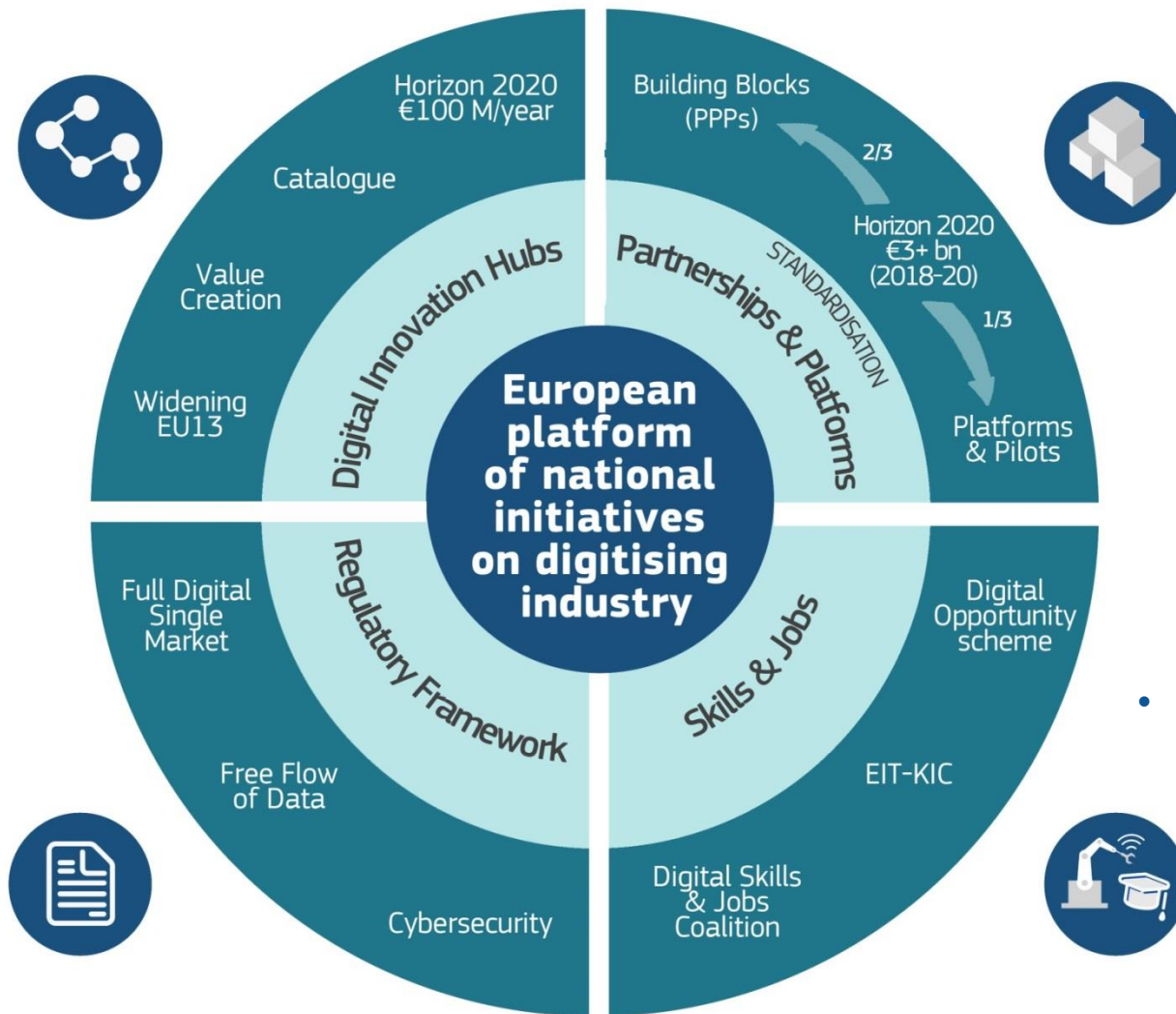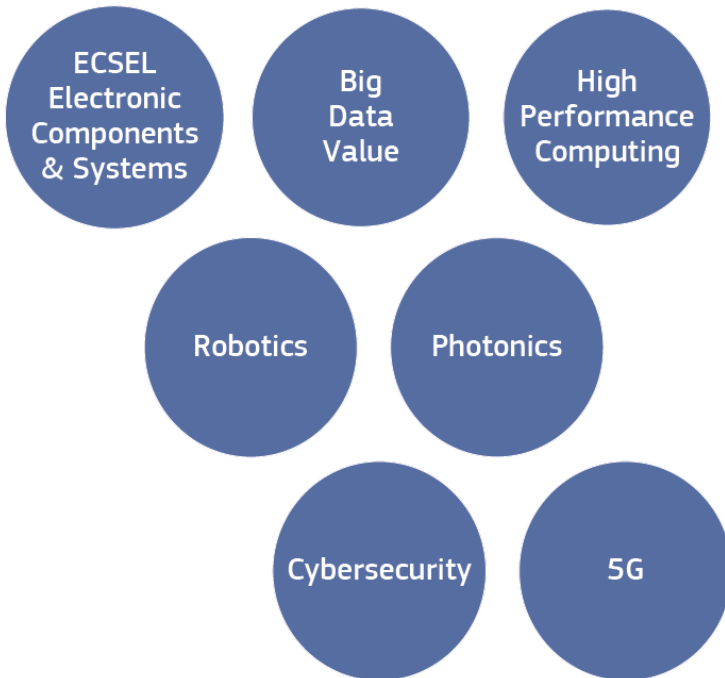
Promote the development:

- Open cross-sectorial platforms
- European reference architectures
- Experimentation, validation, interoperability testing facilities
- Interoperability standards
- Trusted labels and certification schemes

- Launch lighthouse pilot projects
  - JU ECSEL
  - Standards Validation
  - Large scale test-beds

European Commission

Collaboration fostering digital in-novation in specific sectors

ECSEL Electronic Components & Systems

Big Data Value

High Performance Computing

Robotics

Photonics

Cybersecurity

5G

Digitising Industry Focus Area

Connected automated driving collaboration

IoT Focus Area

FoF Factories of the Future

SPIRE Sustainable Process Industry

ECSEL Lighthouse Initiatives

Digital PPPs: providing the building blocks

Public-Private Partnership (PPP)

EU collaboration

Actions on partnerships and platforms:
https://ec.europa.eu/digital-single-market/en/industrial-platforms-and-large-scale-pilots

X *A place or opportunity for public discussion*
e.g. European Platform of National Initiatives

✓ *An operating system that integrates different technologies and various applications and services*

X *Online platforms in the consumer world*
e.g. Facebook, Nest, Android

✓ *Industrial platforms in the business world*

It's a
Fan!

It's
a Wall!

It's
a
Rope!

It's a
Spear!

It's
a Snake!

It's a
Tree!
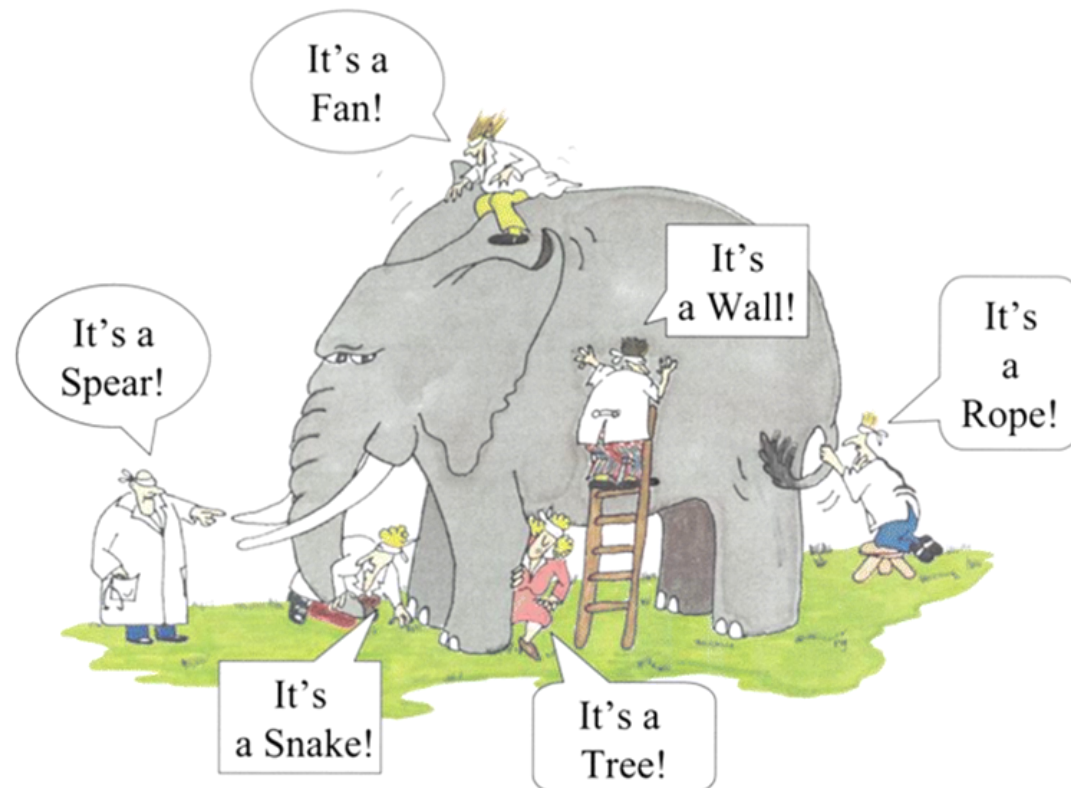
Roles of digital industrial platforms

Network/Marketplace/ Community

- Explicit connections between users
- Network is key value

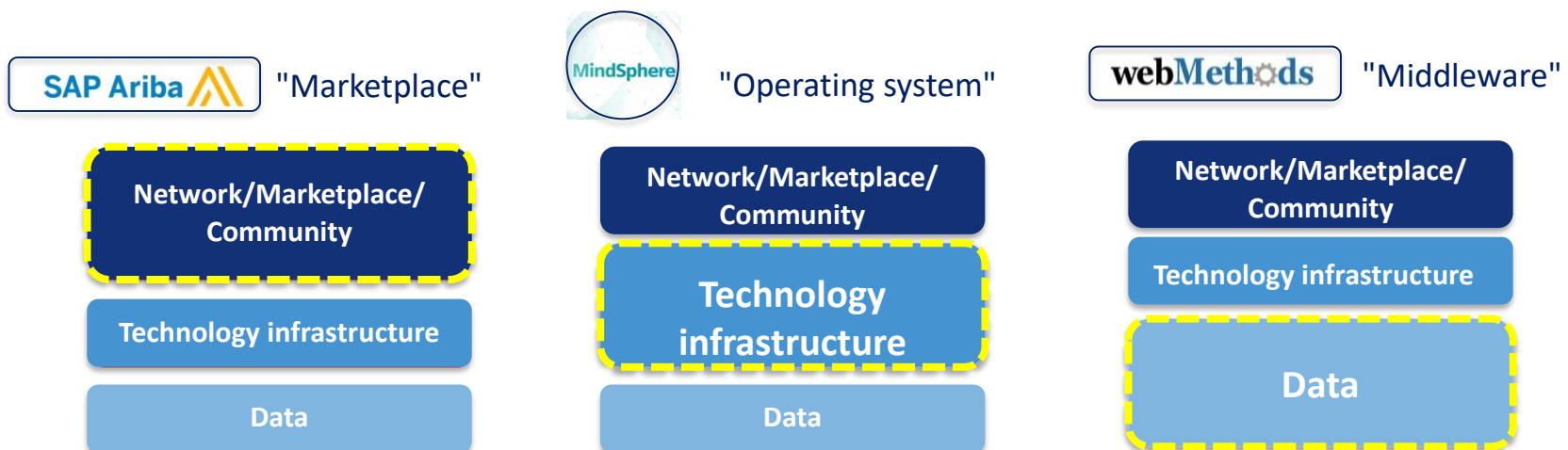**Technology infrastructure**

- Complementary applications
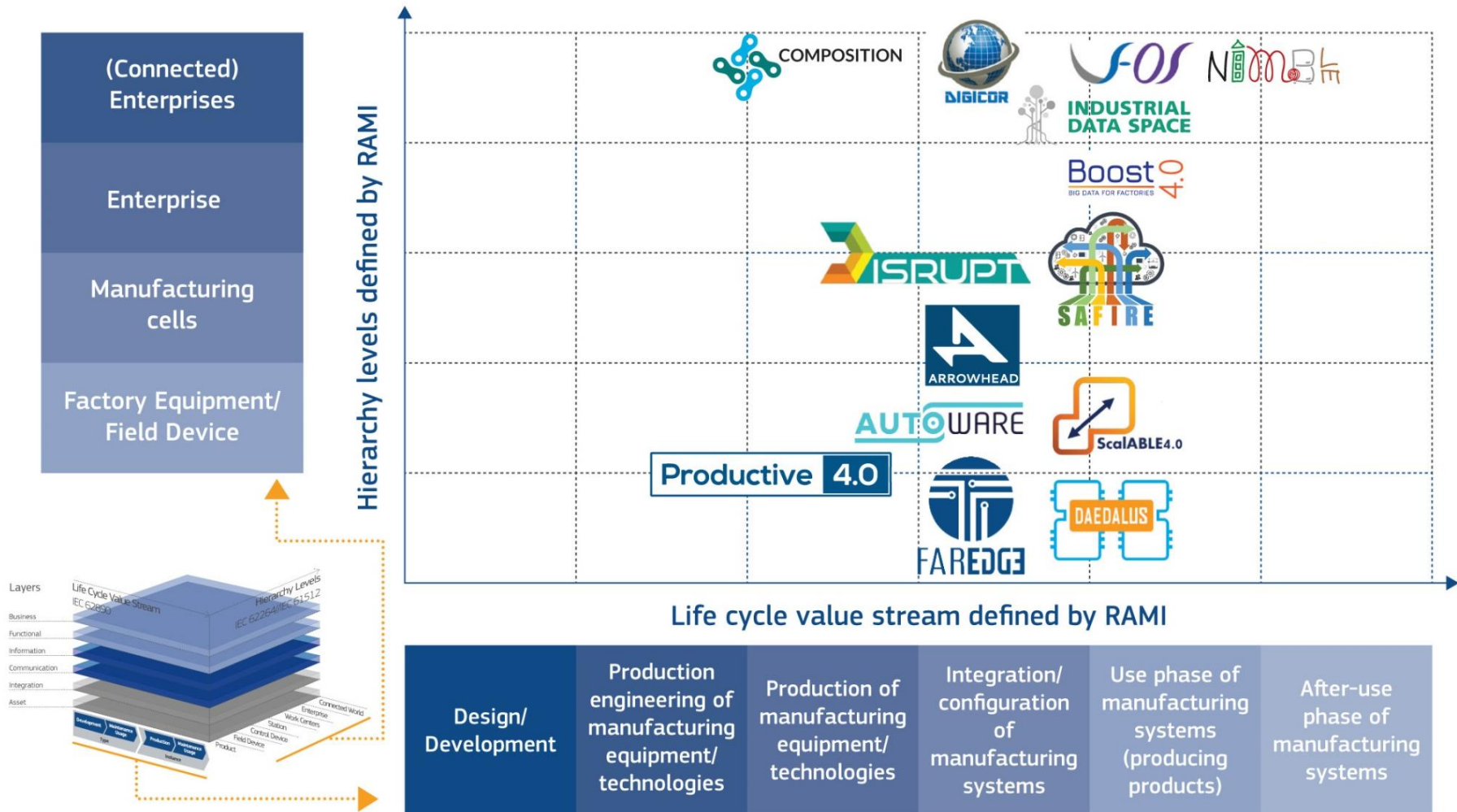- Development platforms

Data

- Unlock data
- Integration

Examples of how different platforms fill in roles in different ways and to varying degrees

SAP Ariba "Marketplace"

| Network/Marketplace/ Community |
| Technology infrastructure |
| Data |

MindSphere "Operating system"

| Network/Marketplace/ Community |
| Technology infrastructure |
| Data |

webMethods "Middleware"

| Network/Marketplace/ Community |
| Technology infrastructure |
| Data |

Adapted from http://platformed.info/platform-stack/

European Commission

Mapping EU platform projects on the RAMI 4.0 reference architecture model

Hierarchy levels defined by RAMI

- (Connected) Enterprises
- Enterprise
- Manufacturing cells
- Factory Equipment/ Field Device

Life cycle value stream defined by RAMI

Design/ Development	Production engineering of manufacturing equipment/ technologies	Production of manufacturing equipment/ technologies	Integration/ configuration of manufacturing systems	Use phase of manufacturing systems (producing products)	After-use phase of manufacturing systems

COMPOSITION, DIGICOR, F-OS, NIMBLE, INDUSTRIAL DATA SPACE, Boost 4.0 BIG DATA FOR FACTORIES, DISRUPT, SAFIRE, ARROWHEAD, AUTOWARE, ScalABLE4.0, Productive 4.0, FAREDGE, DAEDALUS

Layers
IEC 62890
Business
Functional
Information
Communication
Integration
Asset

CONNECTED FACTORIES

Note: This includes a portfolio of more than €100 million EU investment across different projects

European Commission

Digital Manufacturing platforms for connected smart factories

Agricultural digital integration platforms

Digital service platforms for rural economies

Smart hospital of the future

Smart and healthy living at home

Smart construction

Interoperable smart homes and grids

Big Data solutions for energy

5G for connected & automated driving

Cross-cutting issues, IoT, Data, Security...

Horizon2020 (~1B€ for 2018-20):
- Focus Area Digitising and Modernising European Industry - Platforms & Piloting: 300 M€
- ECSEL Lighthouse Initiatives and pilot lines
- cPPPs: 5G, Data Value, Photonics, Robotics, …

LEIT-ICT

✓ **DT-ICT-07-2018-2019: Digital Manufacturing Platforms for Connected Smart Factories – 93 M€ IAs + 2 M€ CSA**

✓ DT-ICT-08-2019: Agricultural digital integration platforms

✓ DT-ICT-09-2020: Digital service platforms for rural economies

✓ DT-ICT-10-2018-2019: Interoperable and smart homes and grids

✓ DT-ICT-11-2019: Big data solutions for energy

✓ DT-ICT-12-2020: The smart hospital of the future

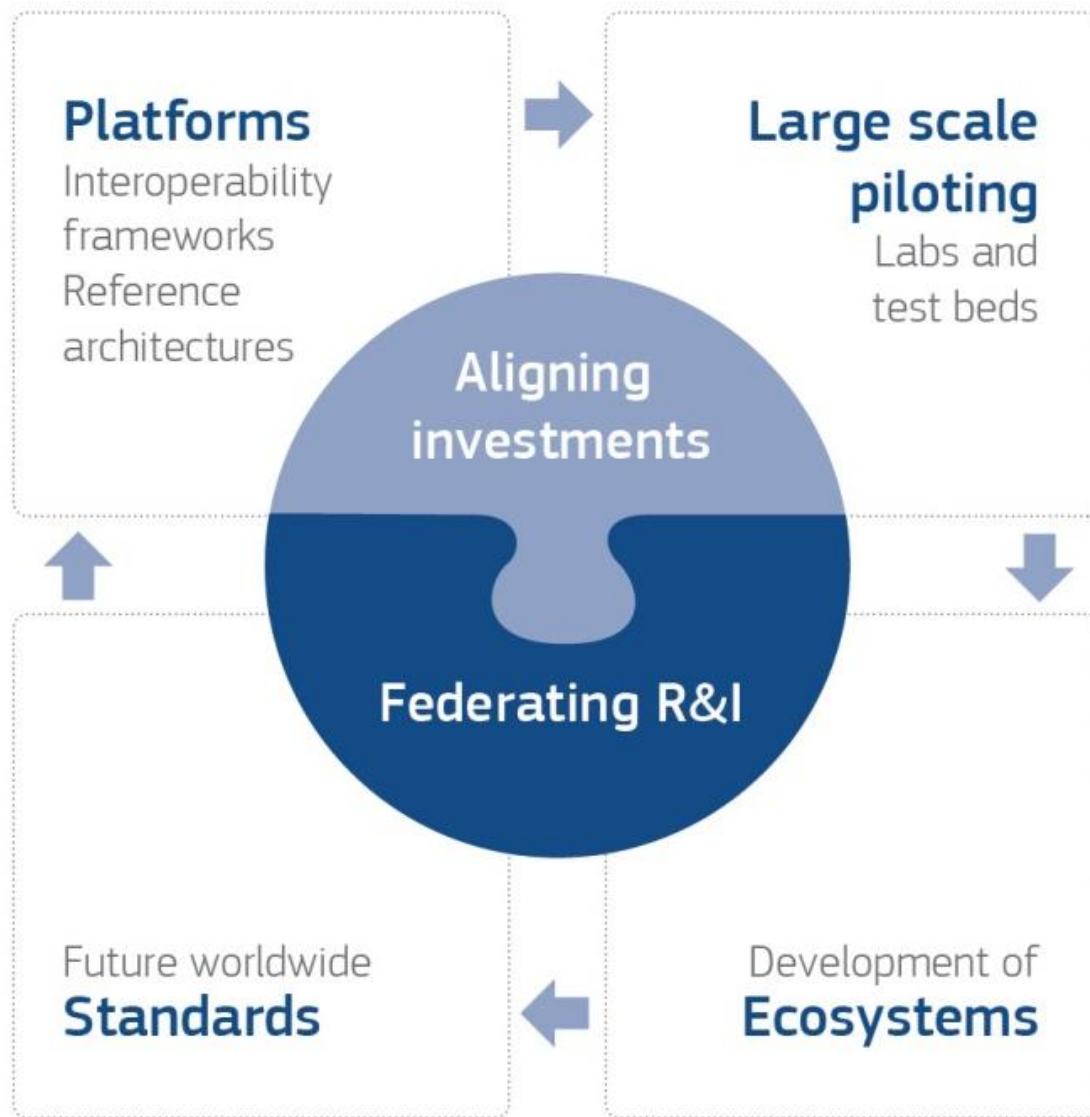✓ DT-ICT-13-2019: Digital Platforms/Pilots Horizontal Activities

SC1

✓ DT-TDS-01-2019: Smart and healthy living at home

LEIT-NMBP

✓ DT-NMBP-20-2018: A digital 'plug and produce' online equipment platform for manufacturing

https://ec.europa.eu/research/participants/portal/desktop/en/funding/reference_docs.html#h2020-work-programmes-2018-20

Platforms
Interoperability
frameworks
Reference
architectures

Large scale piloting
Labs and test beds

Aligning investments

Federating R&I

Future worldwide **Standards**

Development of **Ecosystems**

**Total funding
95M€ over 2 years**

Proposals up to 16 M€ considered appropriate

2018:
- Agile Value Networks
- Excellence – zero-defect

2019:
- Human factor
- Sustainable value networks – circular economy

- **Key objectives**
  - Future global standards & platforms driven by interests of EU actors
  - EU actors join forces along common interests

- **Approach: Bottom-up standardisation & platforms (TRL 5-8)**
  - Ref. architectures, platforms, interoperability frameworks
  - Testbeds + large scale/system level experimentation
    - Broad experimentation by SMEs and mid-caps
  - Standardisation & ecosystem building

- **Scope**
  - Addressing the domain challenges of the future
    - Profiting from digital advances (AI, analytics, IoT, …)
  - Building on existing platforms/ref architectures
  - Balancing the interest of EU industrial actors
    - Large – Small, users – providers, industrial – societal
  - Focus on basic concept / grand challenges

Interoperability
essential for a Digital Single Market
seamless flow of data across sectors and value chains

Innovation
open innovation systems move fast
standards processes struggle to keep up

**INCREASING
COMPLEXITY**

Non-technical aspects
existing standards should be refined

Chicken and egg problem
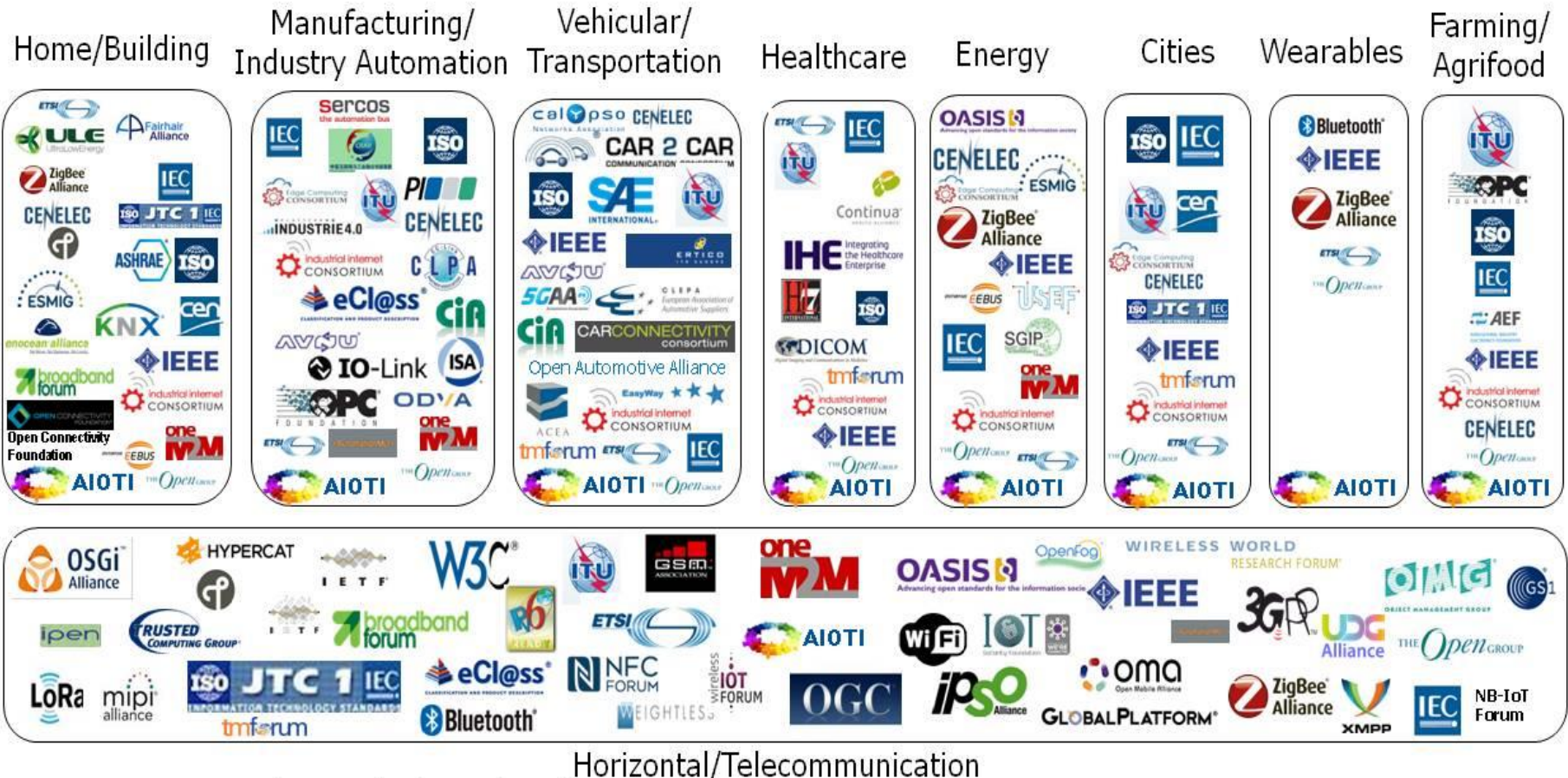For standards definition at appropriate level

Acceptance
communities are sceptical

####### Policy & Legislation
security and privacy are still a limiting factor

IoT SDOs and Alliances Landscape (Vertical and Horizontal Domains)

Source: AIOTI WG3 (IoT Standardisation) – Release 2.8

COM (2016) 180: Digitising European Industry - Reaping the full benefits of a Digital Single Market

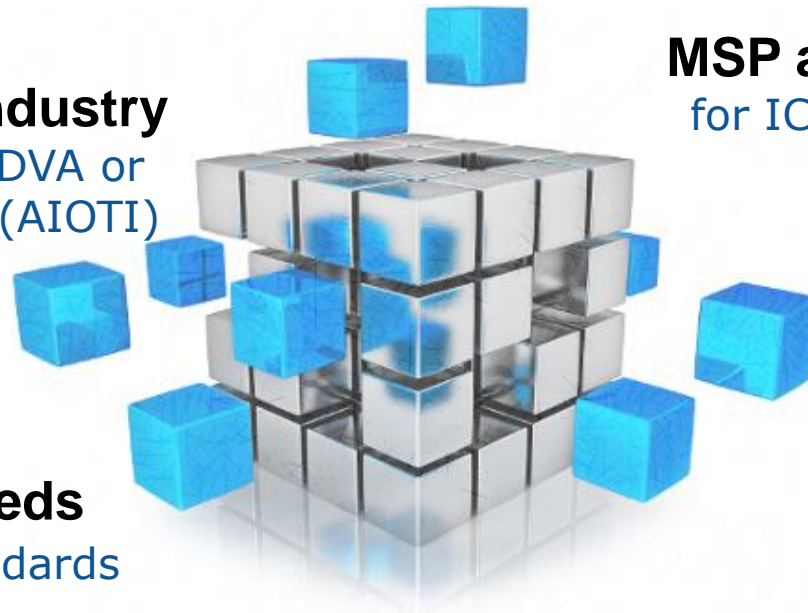**COM (2016) 176:** ICT Standardisation Priorities for the Digital Single Market

Partnership with Industry through PPPs (FoF, BDVA or ECSEL) and alliances (AIOTI)

MSP and Rolling Plan for ICT Standardisation

Pilots and Testbeds supporting ICT standards

Digital Industrial Platform actions under **Horizon 2020**

JIS Action 14: Digitisation

Joint MSP/DEI Working Group

Next Steps…

European Commission

1. How to best support the Digital Industrial Platform actions under Horizon 2020 as a fast-track towards EU-driven standards?

2. For which sectors and emerging standards is EU-wide collaboration needed to ensure Europe-wide interoperability?

3. Following the RAMI approach, in which fields is pan-EU co-operation on Reference Architectures needed?

4. What do you see as the role of European Standards Development Organisations (SDO) today and in future?

5. How to take it forward from here? Is there a need for a Working Group under DEI to coordinate Standardisation Actions?

- Is OPC-UA widely accepted as a "connectivity" standard for M2M on the shop floor to link it to the office?
  - ➤ Sufficient also for connectivity between products across the life-cycle?

- Where do we stand on semantic interoperability of machines?
  - ➤ Do we need pan-EU collaboration on this "companion stack" by sector to avoid fragmentation?
    - – e.g. machine tools, agriculture (ISOBUS), manufacturing … ?
    - – e.g. national across industrial association ?

- What level of interoperability of standards is needed?
  - ➤ Technical
  - ➤ Syntactic
  - ➤ Semantic
  - ➤ Process
  - ➤ Business

  => What level of interoperability would give Europe a leading edge?

European Commission

Following the RAMI approach, in which fields is pan-EU co-operation on Reference Architectures needed ?

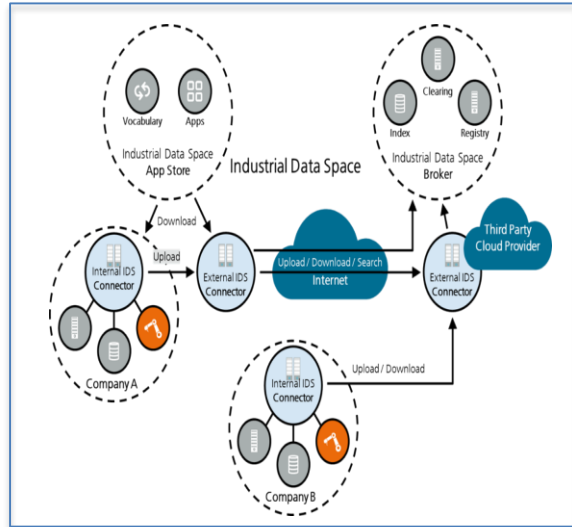**Reference Architectural Model Industrie 4.0** (RAMI 4.0)
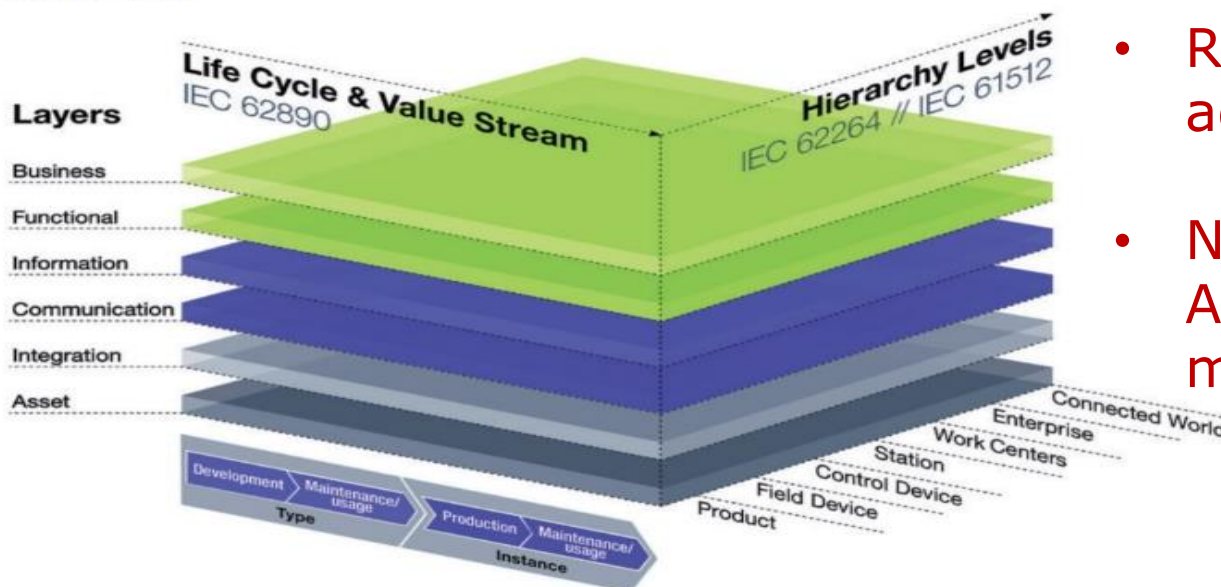
Source: Plattform Industrie 4.0

- Role of the RAMI administrative shell?

- Need for Reference Architectures beyond manufacturing?

Positioning of the four main Drivers of Industrial IoT

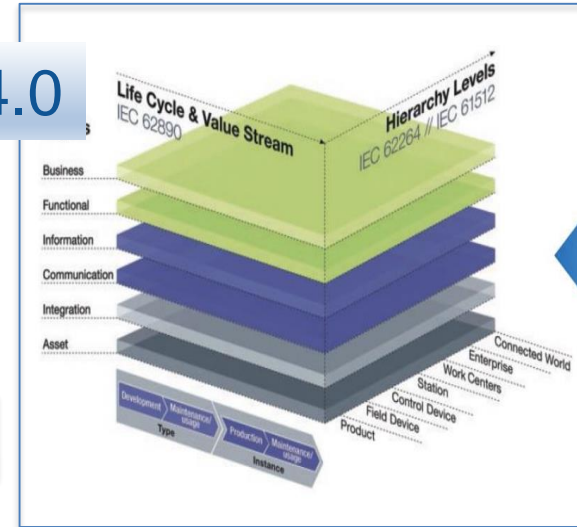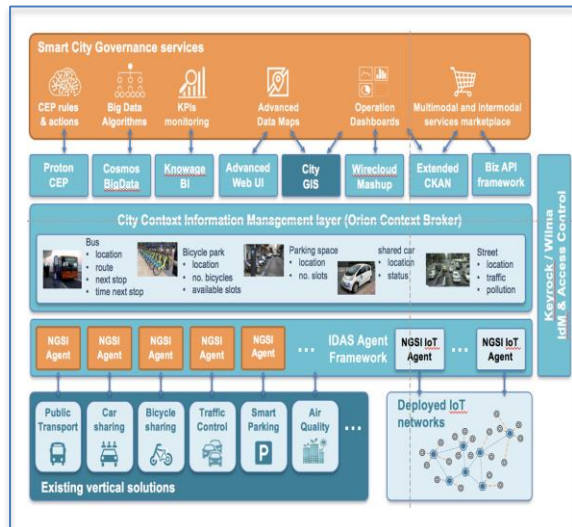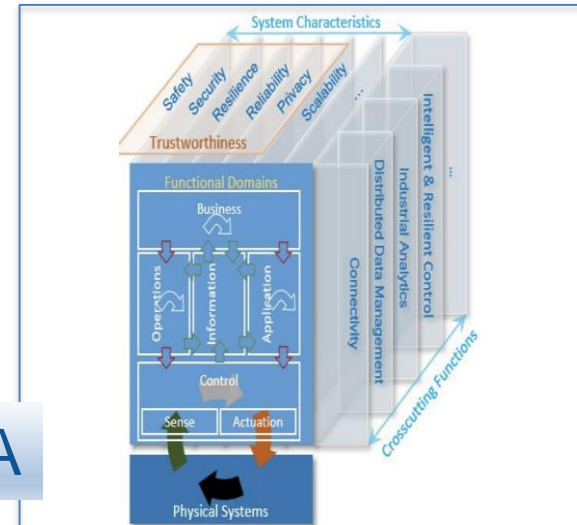Industrial Data Space Reference Architecture

IDS

RAMI 4.0

Reference Architecture Model Industrie 4.0

Interope-rability

FIWARE Reference Architecture

FIWARE

IIRA

Industrial Internet Reference Architecture

Courtesy FIWARE FOUNDATION

Objectives:

- To derive an EU-wide approach to standardisation in support of the European Commission's Digitising European Industry strategy.
- To identify what common high-level standardisation issues need to be tackled by European or national initiatives, and where support, mediation or coordination is needed at an EU level.

Two clear messages:

- There is a strong need to synchronise fragmented activities and the EC should enable this.
- A core element in driving standardisation are test labs or field labs. These are key assets that can be used to test and validate emerging standards across the value chain, while at the same time giving access to, and providing support to SMEs.

https://ec.europa.eu/digital-single-market/en/news/workshop-standardisation-support-digitising-european-industry

Representatives from MSP + experts from initiatives on DEI

14/3	●MSP/DEI WG kick-off meeting	**T**
31/5	●WG Interim Report (Tasks 1-3)	
Week 23	●Open workshop	**A**
14/6	●MSP meeting	
4/10	●MSP meeting	**S**
15/10	●Draft Final Report	
18/10	●Open workshop	**K**
31/10	●WG Final Report	
Week 45	●Final Report delivered to MSP and HLM	**S**
Nov. 2018	●High-Level Governance Meeting	

1) Identify, as a starting point, the standardisation needs in the manufacturing sector, which might serve as a blueprint for other domains in the future.

2) Map the ongoing activities carried out by ESOs, SDOs, fora & consortia, LSPs, PPPs, DE/IT/FR trilateral cooperation, other research projects, etc. that are relevant to the digitisation of European industry.

3) Develop a model for the synchronisation of the various standardisation activities, at the Member State level and at the European level – and in a global context.

4) Propose a first roadmap taking into account existing work such as national standardisation roadmaps and other related work, and specifying concrete actions that may be included in the Rolling Plan for ICT standardisation.

MSP/DEI Open Workshop, 13 June 2017, Brussels
present results from Task 1&2 and get inputs for Task 3&4

Registration via **https://ec.europa.eu/eusurvey/runner/DEI_workshop_june_2018**

"We need a more inclusive and transparent examination of the European approach to standardisation and interoperability, taking account also of user/SME requirements so as to ensure an open process"

Digitising European Industry Stakeholder Forum 2018, Paris

Workshop "Advanced & Interoperable B2B Platforms for Smart Factories"
15-16 October 2018

➢ Discuss interoperability requirements from a users' perspective

➢ Present proprietary and community-driven solutions currently on the market

➢ Look at what future digital industrial B2B platforms would need to address the existing interoperability gaps

**Standardisation primarily is industry business:
EU-level actions help to co-ordinate and strengthen EU positions**

- EC groups / instruments / standardisation bodies
  - Multi Stakeholder Platform (expert group advising the EC)
  - JIS Action 14 (bottom-up approach to improve the ESS)
  - ETSI, CEN/CENELEC
- Research standardisation coordination (roadmaping, gap analysis, …)
  - AIOTI WG3 Standardisation – CSA CREATE-IOT
  - Data Value Standardisation – Data Value PPP, IDS
  - FoF Standardisation – CSA ConnectedFactories
  - Standardisation groups in PPPs, e.g. 5G PPP
- Member States standardisation groups
  - DE Industrie 4.0 Platform & Standardisation Council
  - DE/FR bilateral and DE/FR/IT trilateral co-operation:
    Standardisation and Reference Architectures
- Platform and piloting – a bottom-up standardisation approach:
  - IoT and big data pilots running since early 2017
  - Factories of the Future Platform building projects (FoF-11)
  - DEI platforms and pilots under H2020 WP 2018-20
  - ECSEL JU Lighthouses

Thank you!

Contacts

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Follow the latest progress and get involved

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@DSMeu

ⓑ bit.ly/DigitiseEUpillars
bit.ly/futuriumdei