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!
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."

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

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

42% of large companies is highly digitised in the EU vs 16% of SMEs
Digitising European Industry: a core pillar in a European Industrial Strategy

Industrial Strategy for Europe

September 2017

Digitising European Industry
Part of the Digital Single Market Policy

April 2016: Strong Delivery
Digitising European Industry: Partnerships, Platforms, Standardisation

**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
Collaboration fostering digital innovation in specific sectors

- ECSEL Electronic Components & Systems
- Big Data Value
- High Performance Computing
- Robotics
- Photonics
- Cybersecurity
- 5G

Digital PPPs: providing the building blocks

- Digitising Industry Focus Area
- Connected automated driving collaboration
- FoF Factories of the Future
- ECSEL Lighthouse Initiatives
- IoT Focus Area
- SPIRE Sustainable Process Industry

Actions on partnerships and platforms:
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

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

Industrial platforms in the business world
Examples of how different platforms fill in roles in different ways and to varying degrees

- **Network/Marketplace/Community**
  - Explicit connections between users
  - Network is key value

- **Technology infrastructure**
  - Complementary applications
  - Development platforms
  - Unlock data
  - Integration

Adapted from [http://platformed.info/platform-stack/](http://platformed.info/platform-stack/)
Digital Industrial Platforms Mapping on RAMI

Mapping EU platform projects on the RAMI 4.0 reference architecture model

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

Note: This includes a portfolio of more than €100 million EU investment across different projects
Strengthening leadership: Investment in industrial platforms

- **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, ...

Cross-cutting issues, IoT, Data, Security...
### LEIT-ICT

<table>
<thead>
<tr>
<th>Project Code</th>
<th>Description</th>
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<tr>
<td>DT-ICT-08-2019</td>
<td>Agricultural digital integration platforms</td>
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<tr>
<td>DT-ICT-09-2020</td>
<td>Digital service platforms for rural economies</td>
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<tr>
<td>DT-ICT-10-2018-2019</td>
<td>Interoperable and smart homes and grids</td>
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<tr>
<td>DT-ICT-11-2019</td>
<td>Big data solutions for energy</td>
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<td>DT-ICT-12-2020</td>
<td>The smart hospital of the future</td>
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<tr>
<td>DT-ICT-13-2019</td>
<td>Digital Platforms/Pilots Horizontal Activities</td>
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### SC1

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<th>Project Code</th>
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<tr>
<td>DT-TDS-01-2019</td>
<td>Smart and healthy living at home</td>
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### LEIT-NMBP

<table>
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<tr>
<th>Project Code</th>
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<tbody>
<tr>
<td>DT-NMBP-20-2018</td>
<td>A digital 'plug and produce' online equipment platform for manufacturing</td>
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Strengthening leadership: Digital Industrial Platforms

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
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

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
Complex Landscape

IoT SDOs and Alliances Landscape
(Vertical and Horizontal Domains)

Home/Building
- ULE
- Building Alliance
- CENECEN
- AEC

Manufacturing/
Industry Automation
- ISO
- PI
- CENECEN
- IEC
- OPC

Vehicular/
Transportation
- Car 2 Car
- eClass
- CENECEN
- ISO

Healthcare
- IEC
- Continua
- eHealth

Energy
- IEC
- CENECEN
- ESMG

Cities
- ISO
- IEC
- CENECEN

Wearables
- AIOTI

Farming/
Agrifood
- NB-IoT
- Forum

Horizontal/Telecommunication
- OSGi
- HyperCat
- IETF
- W3C

Source: AIOTI WG3 (IoT Standardisation) – Release 2.8
Addressing standardisation to support the Digitisation of European Industry

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

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

**Pilots and Testbeds**
supporting ICT standards

**Digital Industrial Platform**
actions under **Horizon 2020**

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

**MSP and Rolling Plan**
for ICT Standardisation

**JIS Action 14:** Digitisation

**Joint MSP/DEI**
Working Group

Next Steps…
Key issues addressed during Workshops

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?
Examples of ongoing discussions

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

- Role of the RAMI administrative shell?
- Need for Reference Architectures beyond manufacturing?

Source: Plattform Industrie 4.0
Positioning of the four main Drivers of Industrial IoT

- Industrial Data Space Reference Architecture
- FIWARE Reference Architecture
- RAMI 4.0
- IIRA

More Examples...
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.

### MSP/DEI Open Workshop, 13 June 2017, Brussels

present results from Task 1&2 and get inputs for Task 3&4


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**Representatives from MSP + experts from initiatives on DEI**

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<tr>
<th>Task</th>
<th>Event</th>
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<tr>
<td>T</td>
<td>MSP/DEI WG kick-off meeting</td>
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<tr>
<td>14/3</td>
<td>WG Interim Report (Tasks 1-3)</td>
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<tr>
<td>31/5</td>
<td>Open workshop</td>
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<tr>
<td>Week 23</td>
<td>MSP meeting</td>
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<td>14/6</td>
<td>MSP meeting</td>
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<tr>
<td>4/10</td>
<td>Draft Final Report</td>
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<tr>
<td>15/10</td>
<td>Open workshop</td>
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<tr>
<td>18/10</td>
<td>WG Final Report</td>
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<tr>
<td>31/10</td>
<td>Final Report delivered to MSP and HLM</td>
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<tr>
<td>Nov 2018</td>
<td>High-Level Governance Meeting</td>
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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.
"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 (roadmapping, 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