Implementing the Digitising European Industry initiative

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Technologies and Systems for Digitising Industry

#DigitiseEU
Technologies driving the digital transformation

**IoT (physical meets digital)**
Embedded software, sensors, connectivity, actuators, low power ICT, lasers, ...

**Big data (value from knowledge)**
Analytics, storage, Cloud HPC, ...

**Innovation in products, processes and business models**

**AI and autonomous systems**
Robotics, automation, machine learning, self-driving, ..
Digital value chains

- Micro-electronics & Computing
- 5G
- Software
- Artificial Intelligence (AI)
- Big Data
- Smart Factory
- Autonomous driving
- Healthy aging
DIGITISING EUROPEAN INDUSTRY
EC Communication

Digitising European Industry

To facilitate coordination of European, national & regional initiatives such as Industrie 4.0 (DE), Smart Industry (NL) (SK), Industrie du Futur (FR)

Mainstreaming digital innovation across all sectors:
Setting up a pan-European network of Digital Innovation Hubs

Preparing People for the digital age: Skills & Training

Regulatory framework:
- Free flow of data & data ownership
- Safety & liability of autonomous systems & Internet of Things

Challenges & opportunities of the Internet of Things

CLOUD
European Cloud Initiative in a data-driven economy:
- European Open Science Cloud
- European Data Infrastructure
- Widening access & building trust

STANDARDS
Fast development in 5 priority areas:
- 5G
- Cloud Computing
- Internet of Things
- Data Technologies
- Cybersecurity

To focus investments
(Horizon 2020, EU Investment Plan, EU Structural & Investment Funds, national & regional funds, private sector)

DIGITAL PUBLIC SERVICES

eGovernment Action Plan:
- New Digital Single Gateway
- eJustice Portal
- “Once-only” principle in Administrations
- Cross-border Health services
- eProcurement & “Once-only” in public procurement

Mobilising €50bn of public & private investments

#DigitiseEU @DSMeu
DigitalSingleMarket
bit.ly/DigitiseEU
Vision: Platforms to lead in digital technologies value chains
Key challenges for Industry 4.0 (Kagermann)

- Semantics and models for Industry 4.0
- Systems engineering for adaptive systems
- Logistics 4.0 – self organised and adaptive
- Automated contracting and value networks
- Autonomous production systems and human interaction
Starting Point: Industry-driven platforms

Community-led sector-specific (vertical)  
RAMI

Community-led cross-sector (horizontal)  
S3P

Proprietary with open interfaces  
SIEMENS

FITMAN

AIOTI

CRYSTAL

HANA

for Supply Chain and Manufacturing
Example of a potential platform-based large scale pilot production initiative

Pooling of Resources – Co-investment

Regional Investments
- Best practice Experimentation in zzz aerospace lab
- Best practice Experimentation in xyz truck lab

Industrial Investments
- Real production Auto OEM x with supply chain

Close-to-reality experimentation in xxx auto model factory

Member States Investments
- Large scale experimentation in yyy automotive lab
- EU Investments FoF/SPIRE/ECSEL/…
- SME testing facility at zyx digital innovation hub

Development and integration of platforms, interoperability frameworks, …

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Development and integration of platforms, interoperability frameworks, …
1. EC supports the digital transformation of industry.

2. We will reinforce partnerships with industry, member states and regions.

3. We will use the tools of Horizon2020 including ECSEL to support research and innovation.

4. We will organize a series of events to drive the partnerships.
THANK YOU and stay tuned!

Digitising European Industry

Twitter: #DigitiseEU
A Strategic and Ambitious Initiative on European Scale

- Under the Digitising European Industry Strategy: "Leadership in digital industrial value chains and platforms"
- Overall goal: aligning regional, national and EU strategies for large-scale reference implementations
  - Initiatives by industry and MSs/regions
  - EU provides linking pin: WP 2018-20 PPP FoF-ICT (100M€ +)
- Focusing on a small number of large Innovation Actions
Reflections on degrees of freedom

- Choice of baseline platform(s)
- Use case / sector
- Grand challenge
- Unifying concept
- Steps in product life cycle
- Balance: visionary – real vs lab – innovative - pre-competitive
- Pooling of resources: EU, MSs, industry - conditional funding
- Open platforms and interoperability frameworks while safeguarding the interests of European industrial actors
- Involvement of SMEs
- Size of pilots – how many pilots?
  - Small number of strategic large initiative-type projects with involvement of many actors
  - Large number of small projects with loose coupling

What to be defined a priori?
What to be left open?
Towards interoperable digital platforms for the connected smart factory of the future

- **Key objectives**
  - Future global standards and platforms for the Connected Smart Factory driven by the interests of EU actors
  - EU actors joining forces along common interests in the platform economy

- **Approach: Bottom-up standardisation and platform building:**
  - Reference architectures, platforms, interoperability frameworks
  - Testbeds and large scale experimentation
  - Pilots on manufacturing system level
  - Standardisation and ecosystem building

- **Scope:**
  - Addressing the manufacturing challenges of the future
  - Profiting from digital advances (AI, data analytics, CPS/IoT, ...)
  - Building on existing platforms and reference architectures

- **Basic concept:**
  - "digital twin" of physical assets
  - digital models of production, logistics, ... facilities
The Pilot Factory Concept

I4MS: testlabs, best practices

Support and Integration Framework

Outreach, Ecosystem building, standardisation

Testbeds, Large scale piloting

Platform development

Platform 1

Platform 2

Platform n

Cost efficiency | Resource efficiency | ... | Agility

Automotive | Plant construction | ... | Process industry

Grand Challenge

Manufacturing Sector

15
The European Commission in co-operation with Member States will focus investments in the PPPs to:

- Reinforce the role of PPPs as coordinators of EU-wide R&I effort, national initiatives and industrial strategies by focusing on key technologies and their integration including through large scale federating projects;

- Focus a significant part of the PPPs and national investments on cross-sectoral and integrated digital platforms and ecosystems including reference implementation and experimentation environments in real setting.

The Commission will monitor the commitment by the private sector to invest, on average, at least four times as much as the EU investments in the PPPs and the use of the opportunities offered by financial instruments under EFSI and ESIF.
Digitising European Industry
COM(2016) 180 final, 19 April 2016

- The Commission plans to launch a set of initiatives supporting the building of the digital industrial platforms of the future. **Platforms here are to be understood as multi-sided market gateways creating value by enabling interactions between several groups of economic actors.** Among others, platform building requires the development of reference architectures and their gradual implementation, testing and validation in evolving ecosystems that trigger broad value creation.
ERT Position Paper: Towards European Leadership in the Industrial Internet (August 2016)

- Drive global standards for the industrial internet
  - Promote standards in EU MSs
  - Funds to test and validate standards in concrete use scenarios
  - Funds to further advance standards
  - Better integration of numerous standards
- Foster industry-driven platforms for the industrial internet
  - R&I addressing technology and business challenges including
    - Machine learning and cognitive technologies
    - Next generation of computing and edge computing
    - Ambient user experience
  - Promote the use of existing digital industrial platforms
  - Ensure interoperability of platforms through common standards
    - supporting integrated end-to-end value chains in the industrial internet
Computing

• Slide from consultation

• At the end raise points for reflection
  • Your Position in the value chain,
  • Involve the users of your technology
  • Eco-systems
  • What is the role of the universities?
  • Are there new computing paradigms?
Computing - plenary

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• You provide enabling technologies
• Your work on computing is important.
• Catalogue:...safety critical, cloud,

• Vision for digitisation: crystallisation of industrial platforms:
  • Sub-system can interoperate
  • Reference architectures
  • Standards

• Where is your part?
  • Anticipate what is coming and needed in terms of computing
  • Team up and join eco-systems

• What will the EU do?
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- What will the EU do?
"Digital inside": Innovations in products (all types)

Digital transformations of processes

Radical/disruptive changes in business models
Digital value chains

Micro-electronics & Computing

Autonomous driving

Healthy aging
Smart Connected Factory Platforms

Applications

Platform / Operating System

Sensors / Connection with physical world

Smart Phone

Smart Factory