IoT and the fourth Industrial Revolution

IOT WEEK Industrial Session: the viewpoint of Manufacturing Industry through public-funded Research/Innovation projects

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Manufacturing leading role in the World

Manufacturing, value added (% of GDP) - Year 2014

- Cina: 35.9%
- Korea, Republic: 30.3%
- Germany: 22.6%
- Indonesia: 21.0%
- Japan*: 19.7%
- Mexico: 17.7%
- India: 17.1%
- Russia: 15.6%
- Italy: 15.4%
- Spain: 13.2%
- USA*: 12.5%
- France: 11.2%
- Brasil: 10.9%
- Canada*: 10.7%
- UK: 10.6%

Source: The World Bank
Industrie 4.0: the German CPPS way

Figure 1:
The four stages of the Industrial Revolution

1. industrial revolution
   follows introduction of water- and steam-powered mechanical manufacturing facilities
   End of 18th century

2. industrial revolution
   follows introduction of electrically-powered mass production based on the division of labour
   Start of 20th century

3. industrial revolution
   uses electronics and IT to achieve further automation of manufacturing

4. industrial revolution
   based on Cyber-Physical Systemss

Figure 2:
Industry 4.0 and smart factories as part of the Internet of Things and Services

Internet of Services
- Smart Mobility
- Smart Logistcs
- Smart Grids
- Smart Buildings

Smart Factory
- Smart Product
- Internet of Things
The “SMILE” challenge: European businesses must focus on high value added activities

- Value creation in Manufacturing is progressively shifting towards **pre-production** (R&D and Design) and **post production** (marketing and Pre-or-After sales service) activities

Source: The European House - Ambrosetti re-elaboration on Bruegel data, 2014
The purpose of this Communication is to reinforce the EU’s competitiveness in digital technologies and to ensure that every industry in Europe, in whichever sector, wherever situated, and no matter of what size can fully benefit from digital innovations.

Facilitated by a dynamic framework for coordination experience sharing between public and private initiatives at EU, national and regional level, the proposed actions are expected to mobilise close to 50 B€ of public and private investment in the next 5 years, explore and adapt when needed the legislative framework and reinforce coordination of efforts on skills and quality jobs in the digital age.
“Software, itself, does nothing, it does not build anything, it does not save lives. The objective should be to **adapt it to industrial technologies**. Unify the software with the tools already available”.

The fundamental challenge is to start a business process digitalisation in sectors so far not digitised, which opens a world of opportunities for enterprises”.

**Rosa García**
Presidenta de Siemens en España

July 2014
Speech of Commissioner Oettinger at Hannover Fair 14 April 2015

Objective: Making sure that any industry in Europe, wherever it is located, can make the best use of digital technologies while adapting our workforce to the change

1. Wide-spread adoption: access to technology and knowledge
2. Leadership in digital platforms for industry
3. Closing the digital skills gap
4. Smart regulation for smart industry

An EU wide strategy for digitisation can ensure "scale", mobilise actors with value chains spreading across Europe and support interoperability and standardisation.

DG CNECT: two complementary actions

Two distinct but complementary pillars for Digital technology, incl. FI, adoption in Manufacturing:
• the development of a European Digital Platform (several initiatives to be considered and harmonized in a reference architecture)

• the creation of an EU-wide Ecosystem for digital industrial innovation (implemented by the I4MS initiative and its three Phases)

[Diagram showing various initiatives and platforms related to Digital Industry]

http://i4ms.eu
http://www.beincpps.eu
Digitising Industry + Industrie 4.0

Digitising Industry

IoT
Cloud
OSS
BigData
CPS

Industry 4.0
Agenda of the Session

14:30 - 16:00 IoT and the Fourth Industrial Revolution.

Chair Sergio Gusmeroli (POLITECNICO di MILANO, BEinCPPS coordinator) 5' intro

Panellists (6*10' position slides and then 25' audience / panel discussion)

- **Carl Gisleskog** “IoT in Factories of the Future cPPP: Achievements and Future Perspective”, EFFRA European Factories of the Future Research Association;

- **Andreas Nettsträter** “Democratic Industry 4.0: Ideas, Maker and IoT”, Fraunhofer IML Dortmund

- **Mauro Isaja** “Business Experiments for EU-wide adoption of Cyber Physical Production Systems: the BEinCPPS I4MS Innovation Action”, Engineering Ingegneria Informatica SPA

- **Jacopo Cassina** “CPS for Manufacturing Industry: the sCorPiuS Roadmapping Exercise”, HOLONIX spinoff of Politecnico di Milano

- **Nuria De Lama** “Road2CPS – Roadmap of CPS systems adoption in European strategic sectors“ Atos Spain

- **Unai Martinez** “IoT for innovative Product-Service Systems Design: the ICP4Life FoF project”, Tecnalia Association
Digitising EU Industry 4.0: the role of IoT in the Factories of the Future

- The EC communication "Digitising EU Industry". What is the role of IoT in this digitalisation journey? How to make IoT penetrate products-processes-business of the Manufacturing Industry? IT Industry viewpoint.

- Industrie 4.0, its reference model, its smart service world, its readiness levels. How could EU Manufacturing Industry implement a digital innovation migration path to maximise the benefits of both IoT and Industrie 4.0? Manufacturing Industry viewpoint
BEinCPPS Open Calls: wave I

BEinCPPS I4MS Phase II project aims at spreading the presence of **CPPS-based industrial experiments** to all the Regions of Europe, starting from 5 champion experiments located in **advanced Vanguard EU regions**.

BEinCPPS provides a **CPS/IOT Open Platform** on top of which application developers could base innovative services e.g. in the field of production planning, resources management, logistics optimisation.

**BEinCPPS Open Call 1** targets the development, testing and experimentation of **innovative IT applications experiments**, which, based on CPPS technology, could significantly enhance the impact of CPPS into the Manufacturing Industry and SMEs / Mid Caps in particular.

**Open APIs and datasets** coming from the project's 5 experimental facilities will form an IT infrastructure for a realistic testing and experimentation of the new applications.