



# The Sensing Enterprise - Enterprise Information Systems in the Internet of Things

## *Keynote Lecture*

*28<sup>th</sup> April 2016*

*ICEIS 2016, International Conference of Enterprise Information Systems, Roma*

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## RESEARCH

**250**  
researchers

**70**  
live projects

**33** mln Euros  
investments

**6**  
laboratories

## Innovation areas

Augmented Reality  
Big Data  
Border Security  
Cloud Computing  
Content & Media  
Cyber Security  
Digital Economy  
eHealth  
Energy & Green IT

Future Internet  
Internet of Things  
Open Data  
Open Public Service Innovation  
Payment Systems  
Smart & Social Enterprises  
Tourism & Culture  
Transportation, Logistics & Infrastructures

# ICT for Manufacturing – Why something else?



**Rosa García**  
Presidenta de Siemens en España

“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”.

July 2014

# Digitising Industry vs. Digital Innovation



1. Different **Innovation** pace, speed, jargon, model between IT and Industry (Manufacturing in particular). IT/OT gap. E.g. Hackathons
2. An **Industrial** (Manufacturing) **Innovation** is not limited to software. Important roles are played by further intangibles (data, knowledge, models, human skills) and non-IT tangibles (production systems, engineering infrastructures). E.g. Engagement / Awareness
3. Evolution of basic FI Technologies (CPS, IoT, BigData, Cloud) and integration of domain independent with domain dependent **Software Enablers**. E.g. Industrie 4.0 and RAMI 4.0 compatibility
4. **Cloud Strategy**, Journey, Adoption methods and tools are needed for EU industry in order to fully trust the Open Cloud Value Proposition and its SLAs (availability, scalability, performance, security). E.g. Industry-oriented SLAs and commercial value propositions

# Digital Innovation in Manufacturing: disruptive-incremental - push-pull?



## 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**

COMMISSION PRIORITY  
**Digital Single Market**

Bringing down barriers to unlock online opportunities



*Digital Single Market: making the EU's single market freedoms "go digital"*

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

[http://europa.eu/rapid/press-release\\_SPEECH-15-4772\\_en.htm](http://europa.eu/rapid/press-release_SPEECH-15-4772_en.htm)

# Digitising European Industry April 19th



Brussels, 19.4.2016  
COM(2016) 180 final

COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN  
PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL  
COMMITTEE AND THE COMMITTEE OF THE REGIONS

Digitising European Industry  
Reaping the full benefits of a Digital Single Market

{SWD(2016) 110}

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 and 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.

# Digitising European Industry: 3 steps



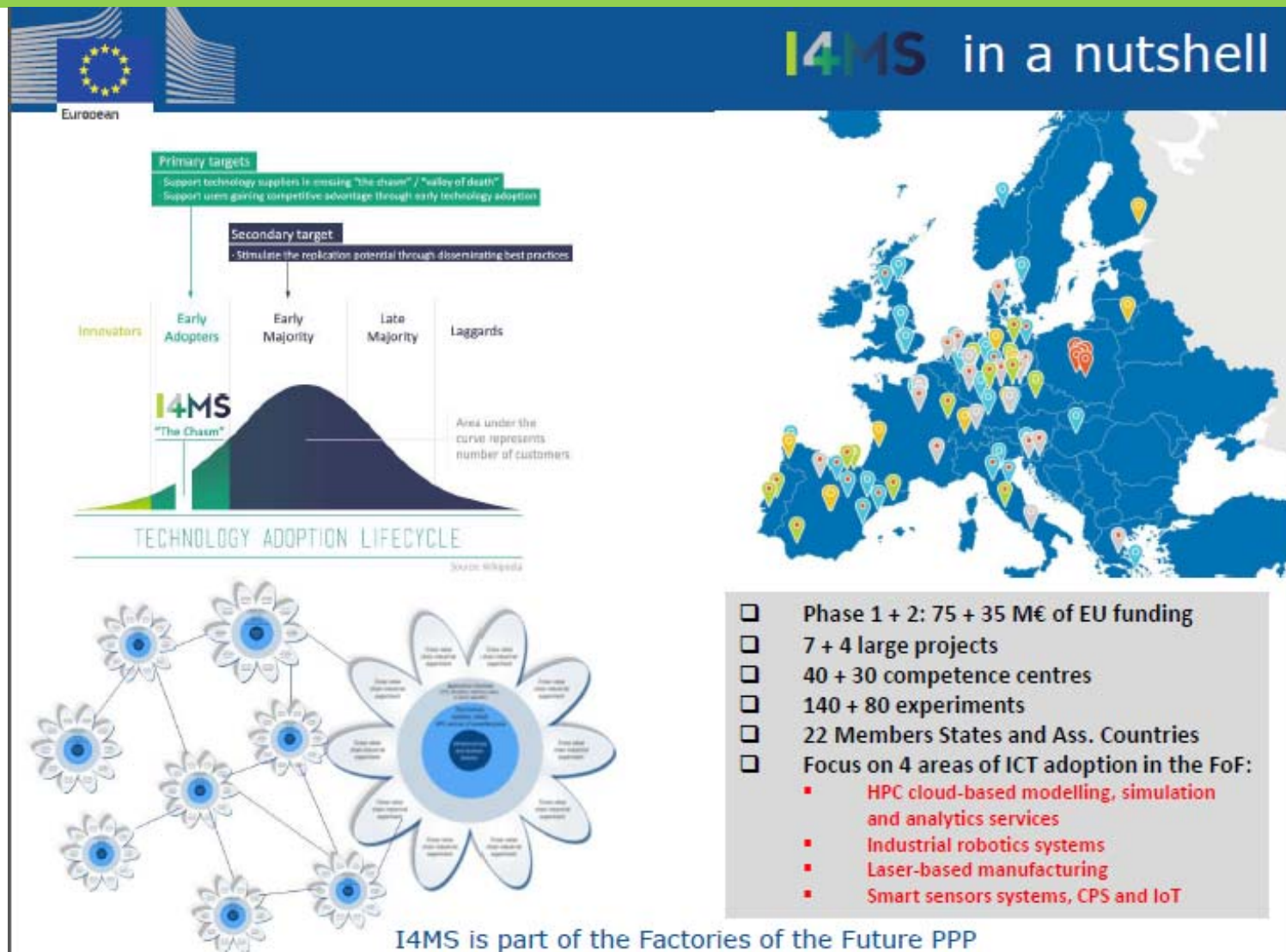
The **DSM strategy**, especially the pillar on "**maximising the growth potential of the digital economy**", contains all the major levers for improving industry digitisation with actions in areas such as the **data economy, IoT, cloud computing, standards, skills and e-government**.

With about **4% of GDP**, the ICT sector in Europe represents an important share of the economy employing more than **6 million people**. The value added of this sector in the EU (production of digital goods), spanning from components to software products is above 580 B€ and represents close to 10 % of the added value of industrial activity overall. Recent studies estimate that digitisation of products and services will add more than **110 B€** of revenue for industry per year in Europe in the next 5 years. Just **in Germany**, further digitisation of industry is expected to bring up to 8 % of productivity growth over ten years and a revenue growth of about 30 B€ per year. It will also lead to a **6 % increase in employment**.

- **Digital Products:** Driven by the development of the Internet of Things. this includes developments of markets like the connected car, wearables or smart home appliances.
- **Digital Processes:** the further spread of automation in production and the full integration of simulation and data analytics over the full cycle from product design to end of life (circular)
- **Digital Business Models** by re-shuffling the value chains and blurring boundaries between products and services. to increase profitability by up to 5.3% and employment by up to 30%.

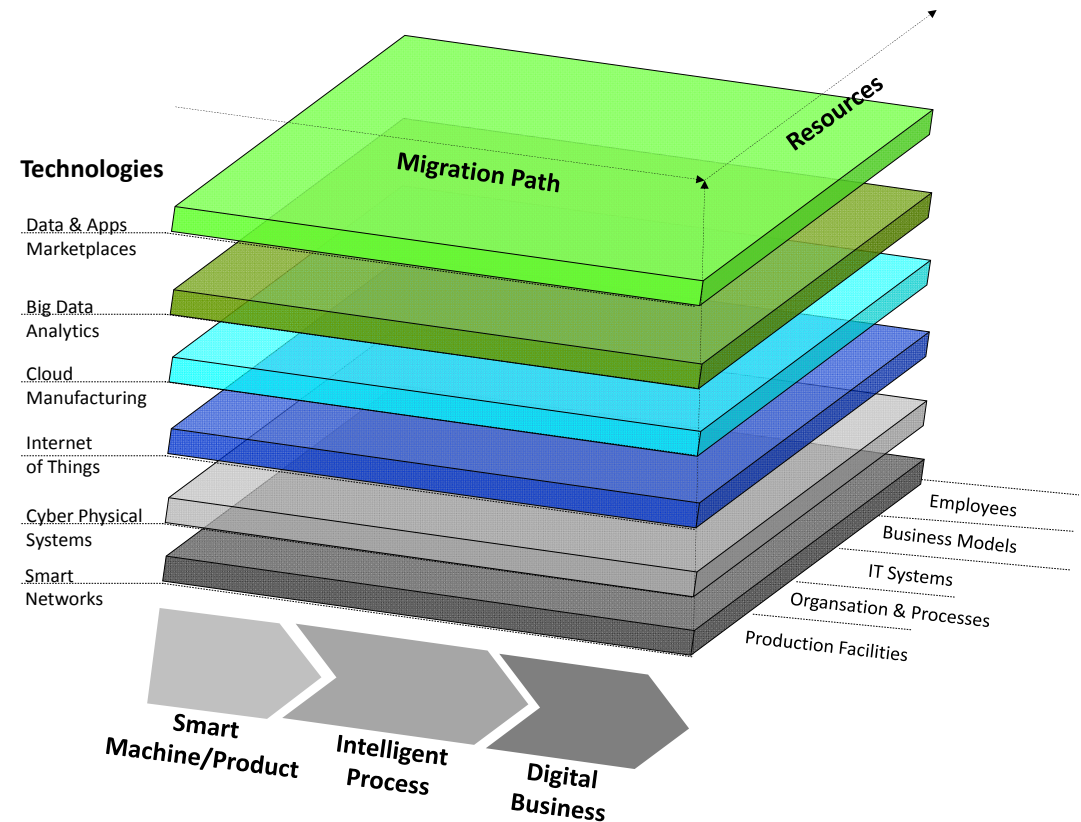
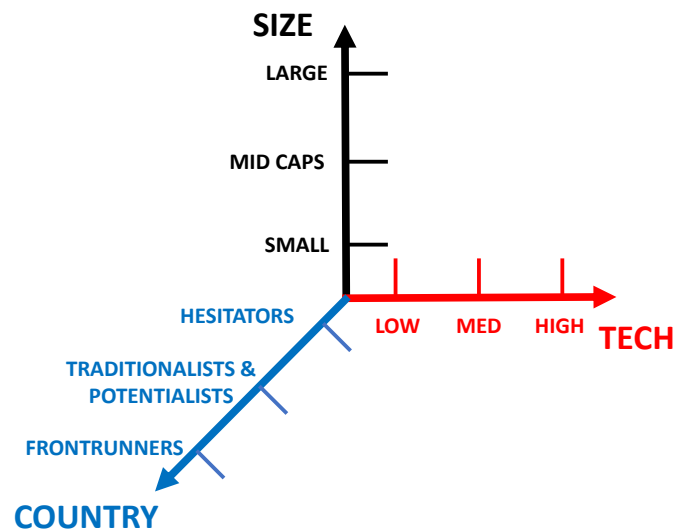
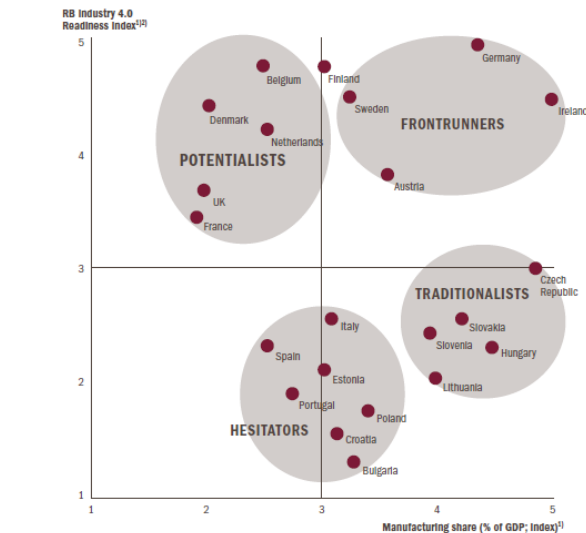


# I4MS Programme: Innovation for SMEs





# Migrating Industry to ICT: a Methodology



# Industrie 4.0 and Digital Skills gap



Several national and regional initiatives such as **Industrie 4.0** (DE), Smart Industry (NL), Catapults (UK) and Industrie du Futur (FR) were launched recently to tap into the opportunities offered by digital innovations in industry. They show the commitment across Europe to seize the digital opportunities ahead. However, addressing the challenges of digital transformation at national level alone bears the risk of leading **to further fragmentation** of the single market and to efforts below the critical mass needed to attract private investments.

About 40% of EU workers have an insufficient level of digital skills. The **need for new multidisciplinary and digital skills** is exploding, such as combined data analytics and business or engineering skills. The gap between the demand for, and availability of digitally skilled workers in Europe is growing. Digital innovations have also a great potential for additional jobs creation in industry with the growth of new businesses and by helping preserve and re-shore industrial jobs. Looking only at ICT professionals, more than a million additional jobs have been created over the last three years. Despite this, it is expected that rapidly growing demand will lead to more than 800 000 unfilled vacancies by 2020. At the same time, advances in automation, robotics and smart systems are increasingly transforming the nature of work, not only for repetitive tasks but also for sophisticated tasks in administrative, legal or supervisory functions. Work in a digitised economy will involve also new skills and capacities including more creativity, communication and adaptability. It will require a massive upskilling of the workforce at all levels. The above hurdles require a collective public and private effort.

# Industrie 4.0: the EU CPPS value proposition

Figure 1:  
The four stages of  
the Industrial Revolution

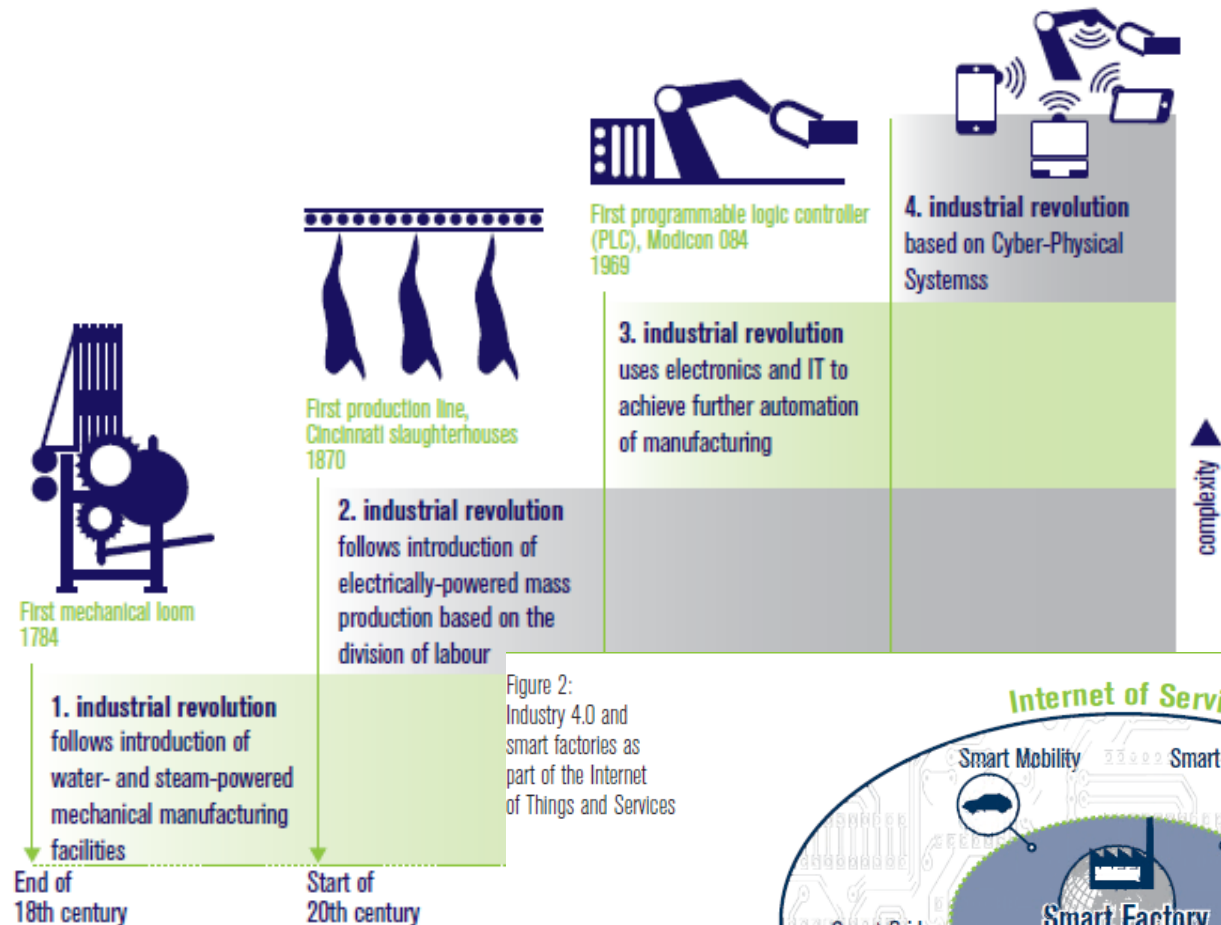
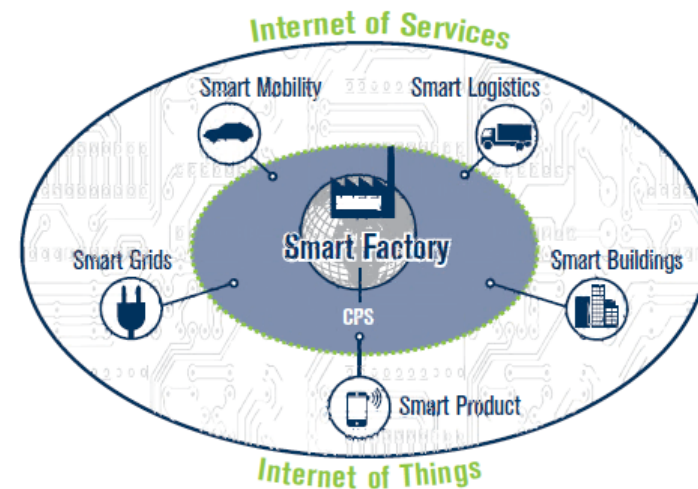


Figure 2:  
Industry 4.0 and  
smart factories as  
part of the Internet  
of Things and Services



# Which Skills Shortage in manufacturing?



Percentage of European companies reporting skills shortages (covers Germany, UK, France, Italy, Switzerland, Belgium, The Netherlands)



Source: Compilation, Adecco Institute Demographic Fitness Surveys 2007-2008

# Regional Digital Innovation Hubs



The Commission plans to focus 500M€ investment from H2020 on **digital innovation hubs** on:

- **Networking and collaboration of digital competence centres** and cluster partnerships.
- Supporting **cross-border collaboration** of **innovative experimentation** activities.
- Sharing of best practices and developing, by end of 2016, a **catalogue of competences**.
- **Mobilising regions** with no Digital Innovation Hub to join and invest22.
- Wider use of **public procurement** of innovations to improve efficiency and quality of public sector

The Commission will also set up in June 2016 a thematic **smart specialisation platform for industrial modernisation**.

The Commission encourages **Member States** and Regions to invest in DIH and incentivise industry to embrace digital innovations and foster synergies with other key enabling technologies..

# I4MS Open Call for Regional DIH



**I4MS** About Experiments Events Open Calls Videos News Regional Hubs

**Call for Regional Digital Manufacturing Innovation Hubs**

**OPEN**

Deadline:  
**28th of April 2016**

**More Information**

**Overview of Digital Manufacturing Initiatives across Europe**

**EU-level Initiatives**

- Application PPPs: FoF, SPIRE
- I4MS
- Smart Anything Everywhere
- ICT PPPs

**Multi-region Initiatives**

- Vanguard

**United Kingdom**

- High Value Manufacturing Catapult
- Innovate UK
- EPSRC Manufacturing the Future
- Action Plan for Manufacturing (Scotland)

**Belgium**

- Made Different
- Flanders Make/iMinds (Flanders)

**France**

- Industrie du Futur
- FoF Ile-de-France

**Portugal**

PRODUCECH

**Spain**

- Industria Conectada 4.0
- Basque Industry 4.0
- MDI 4.0 - TECNALIA

**Sweden**

Produktion 2030

**Denmark**

MADE - National Initiative

**Netherlands**

Smart Industry

**Finland**

- FIMECC PPP Programmes (MANU, S-STEP, SIMP, S4Fleet)
- Industrial Internet Business Revolution

**Poland**

- INNOMED
- INNOLOT
- CuBR
- BIOSTRATEG

**Latvia**

Riga IT Demo Centre

**Germany**

- Plattform Industrie 4.0
- Smart Service World
- Autonomik für Industrie 4.0
- Allianz Industrie 4.0 BW
- It's OWL (Ostwestfalen-Lippe)
- Allianz Industrie 4.0 (Baden-Württemberg)

**Austria**

Produktion der Zukunft

**Italy**

- Internet of Things and Industry 4.0
- Fabbrica Intelligente
- Ass. Fabbr. Intell. Lombardia

**Greece**

Operational Programme in Region Western Greece

European initiatives are in red  
National initiatives are in blue  
Regional initiatives are in green

European Commission  
DG CONNECT, Unit A3, ML

I4MS as a whole aims to do business from **EXPERIMENTS**. This is the concept of DIH: 'one-stop-shops' for any business to access support in understanding digital technologies and support on how to finance/nurture the necessary investments

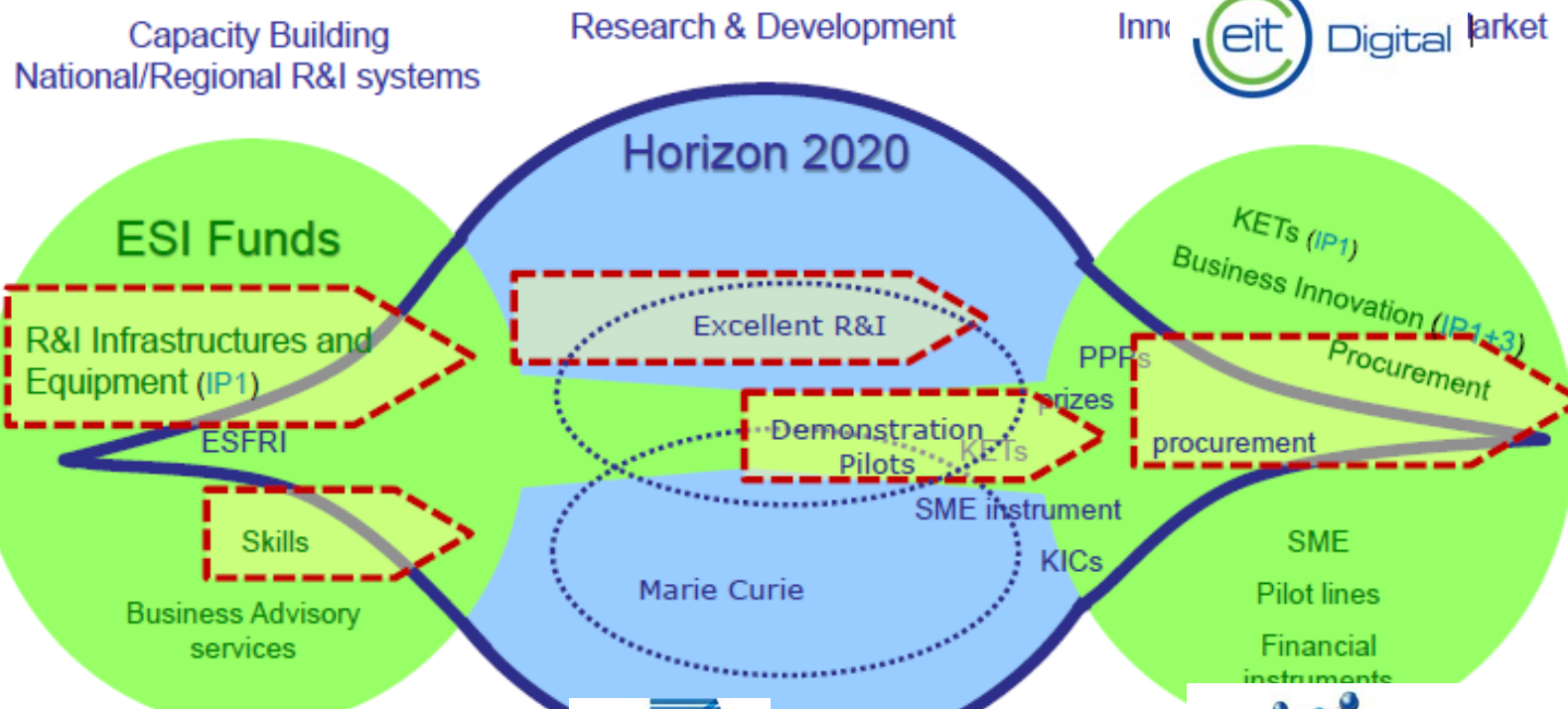
- Hub expands the Competence Center with non-technological services and activities to support SMEs/MidCaps with business dev
- Services include networking, showcasing, matchmaking, brokerage, startup support, advice on IPR, and dissemination activities, etc
- Development of the innovation network with regard to the (regional) ecosystem is supported
- Organisations involved are triple helix and horizontal/vertical supply chain actors



# Confluence ESIF, H2020 and gotomarket



## How can stakeholders benefit from both instruments?



**European Union**  
European Structural  
and Investment Funds



# Digitising European Industry April 19th



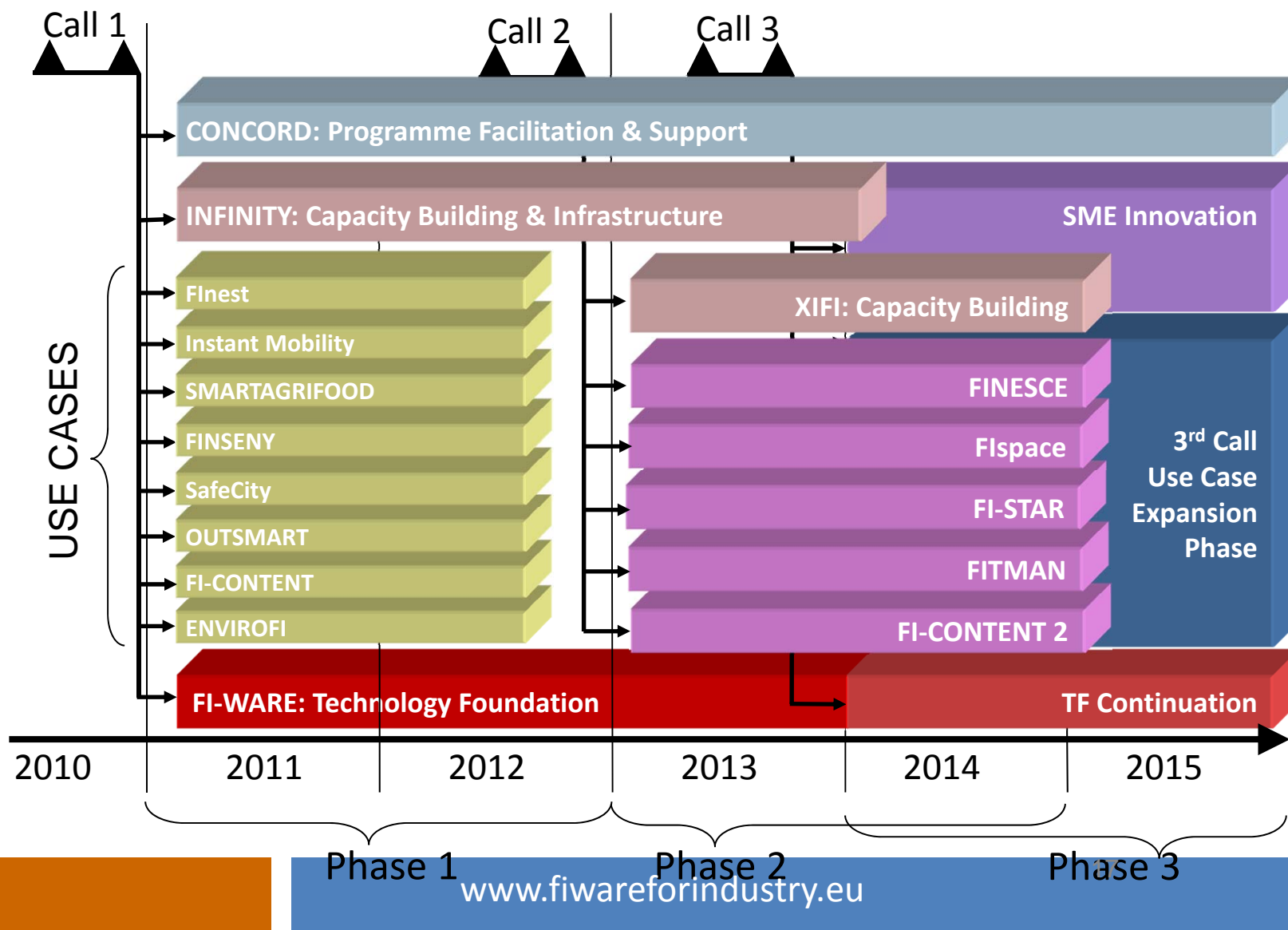
Overall, more than 20 B€ are already planned to be invested in the coming 5 years in the digital-sector PPPs by industry and the EU in support of strategic R&I agendas.

Given the national level of public support to R&I in ICT, the **total investment can reach up to 35 B€** in the next 5 years if Member States would dedicate at least 3 B€ per year to these strategies including financing opportunities from **EFSI and ESIF**. Such levels of focused investments will bring a radical step change to Europe's innovation capacity and endow industry with unique differentiating factors to compete at a global scale.

**Leadership in IoT:** The Commission will invest in demand-driven large-scale pilots and lighthouse initiatives in areas such as smart cities, smart living environments, driverless cars, wearables, mobile health and agro-food.

The investment will address notably **open platforms** cutting across sectors and accelerate innovation by companies and communities of developers, building on existing open service platforms, such as **FIWARE**. The accompanying **staff working document on IoT** outlines a.o. standardisation and regulation challenges and opportunities for IoT and the role of **the Alliance for IoT Innovations (AIOTI)**.

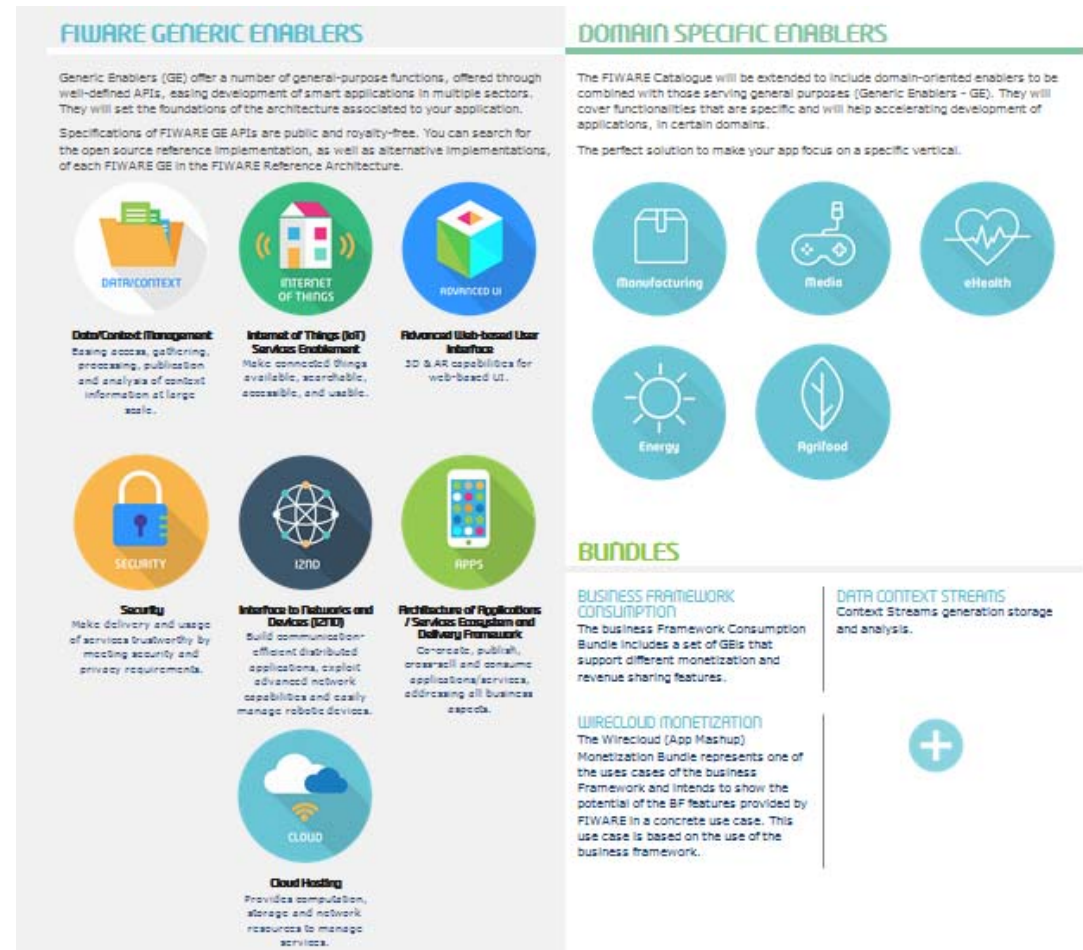
# The FI PPP Programme in FP7



# The FIWARE Open Platform



- <http://fiware.org>
- <http://lab.fiware.org>
- <http://catalogue.fiware.org/>

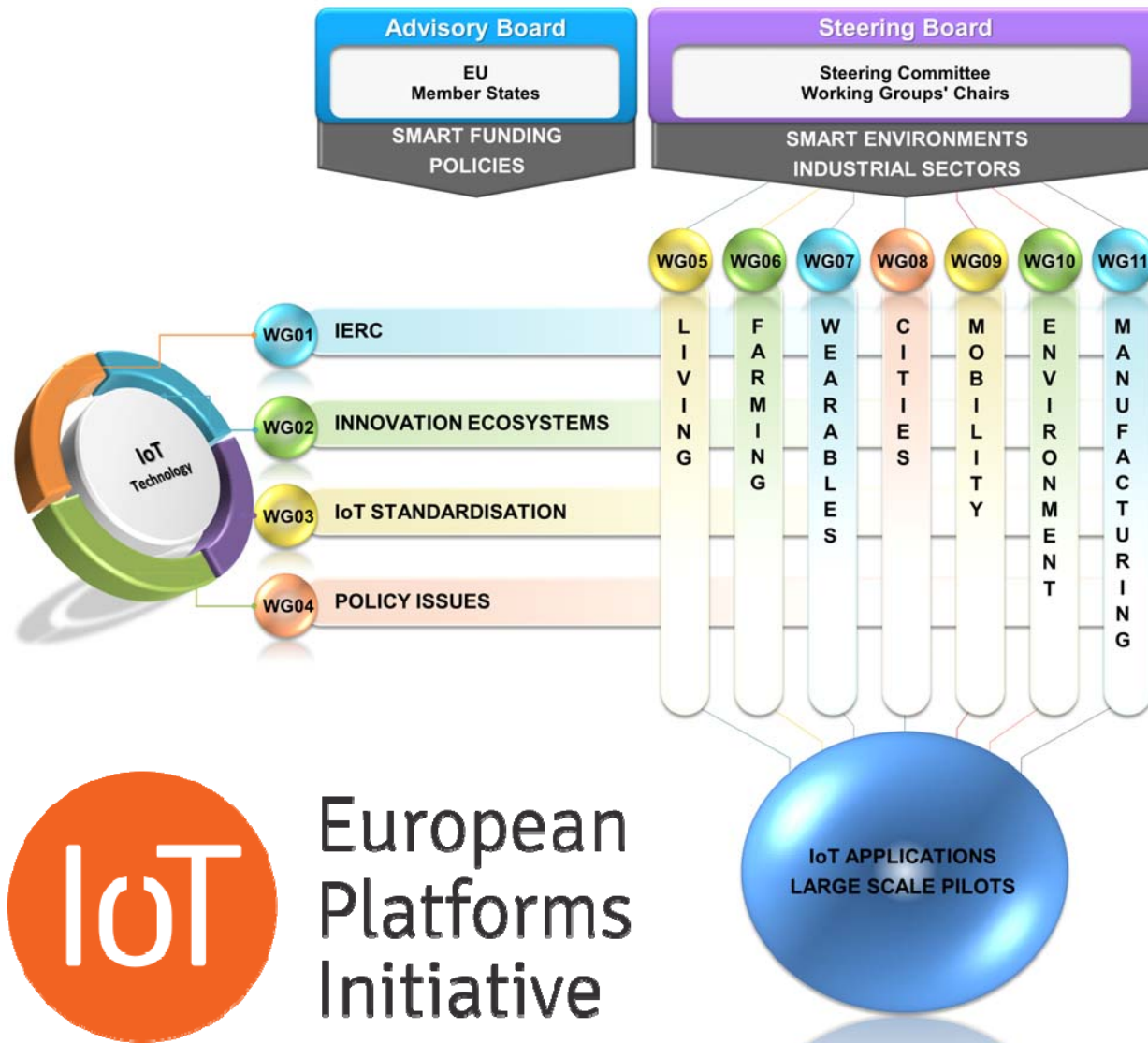


# Open Platform: the AIOTI Alliance



ALLIANCE FOR INTERNET OF THINGS INNOVATION - AIOTI

[www.aioti.eu](http://www.aioti.eu)



Four horizontal working groups and seven (for the time being) verticals covering different application domains.

Call ICT 2016 and IoT.1  
Large Scale Pilots in five different domains

 **IoT OPEN PLATFORMS**



# Open Platform: the AIOTI WG11



## WG11 Smart Manufacturing



Contact For More Information:  
Zeljko Pazin ([Zeljko.pazin@effra.eu](mailto:Zeljko.pazin@effra.eu))



# Manufacturing Renaissance in EU

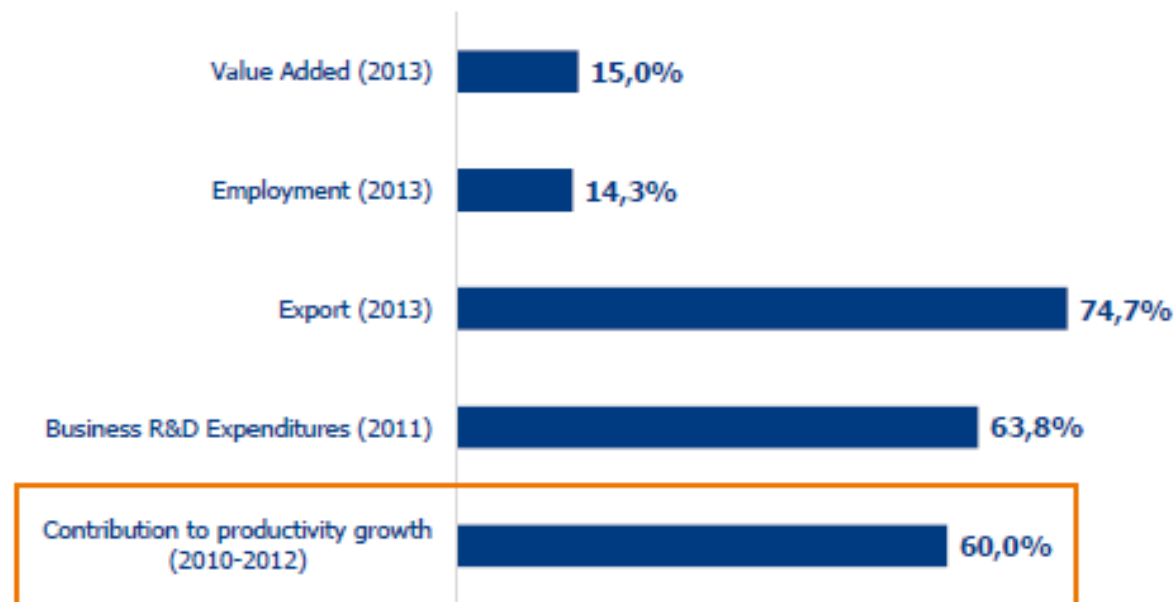


World Manufacturing Forum



... this is why Manufacturing is such a pivotal sector for Europe

**Importance of Manufacturing sector in the EU (% on the total economy)**



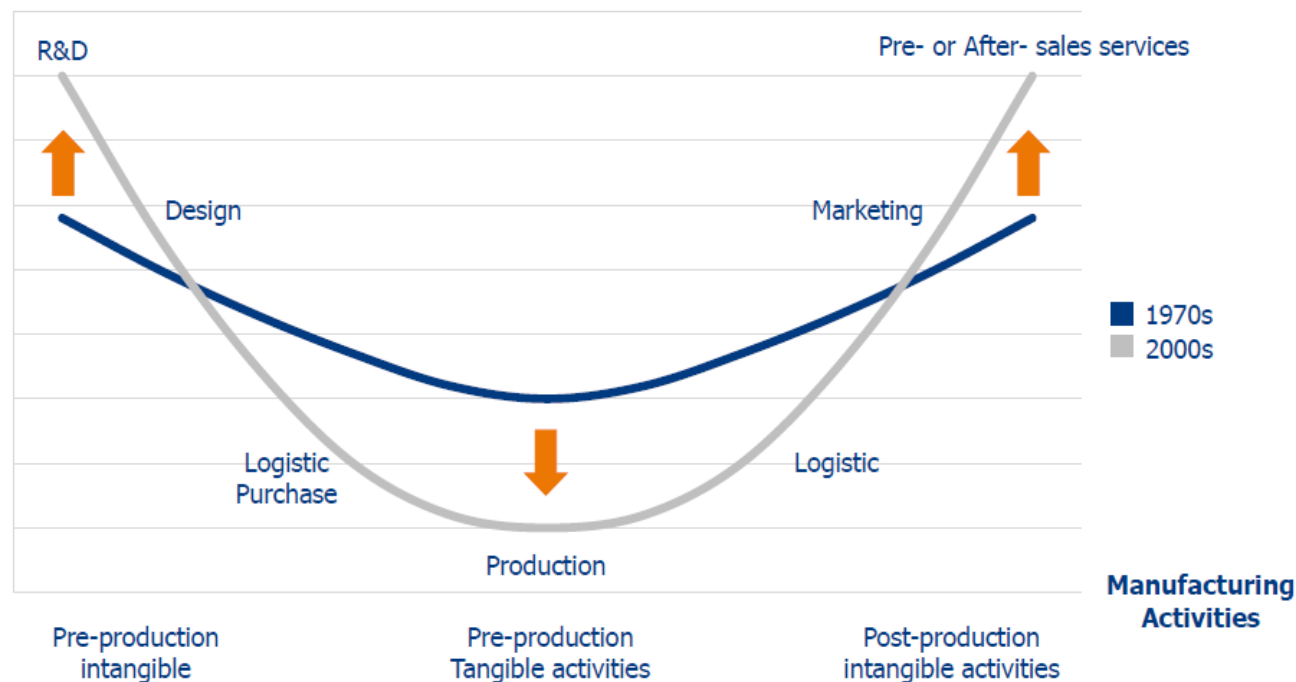
Source: The European House - Ambrosetti re-elaboration on Eurostat, AMECO and OECD data, 2014

# Manufacturing evolution 1970s-2000s



The "SMILE" challenge: European businesses must focus on high value added activities

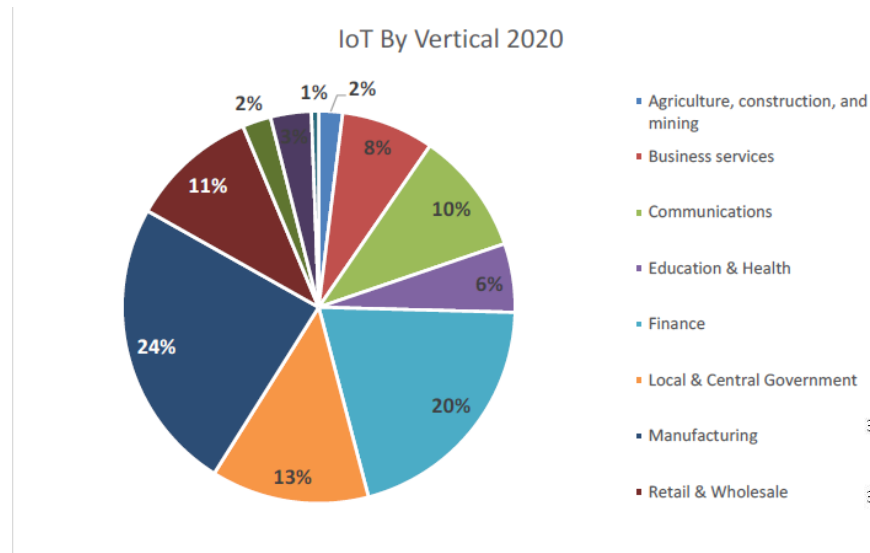
Value Added



- 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

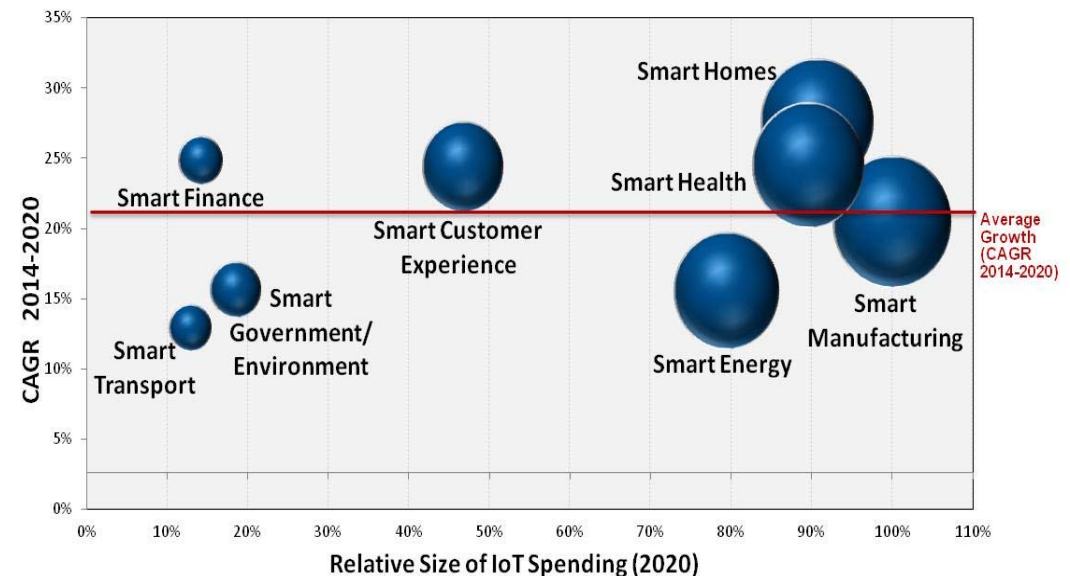
# FI-driven Innovation in Manufacturing



Source: IDC 2014

Smart Manufacturing is one of the most promising domains for IOT-driven innovation (24% of the estimated IOT EU market size)

Smart Manufacturing excels not just in the potential size of the market, but is also well positioned regarding the estimated growth of such a market



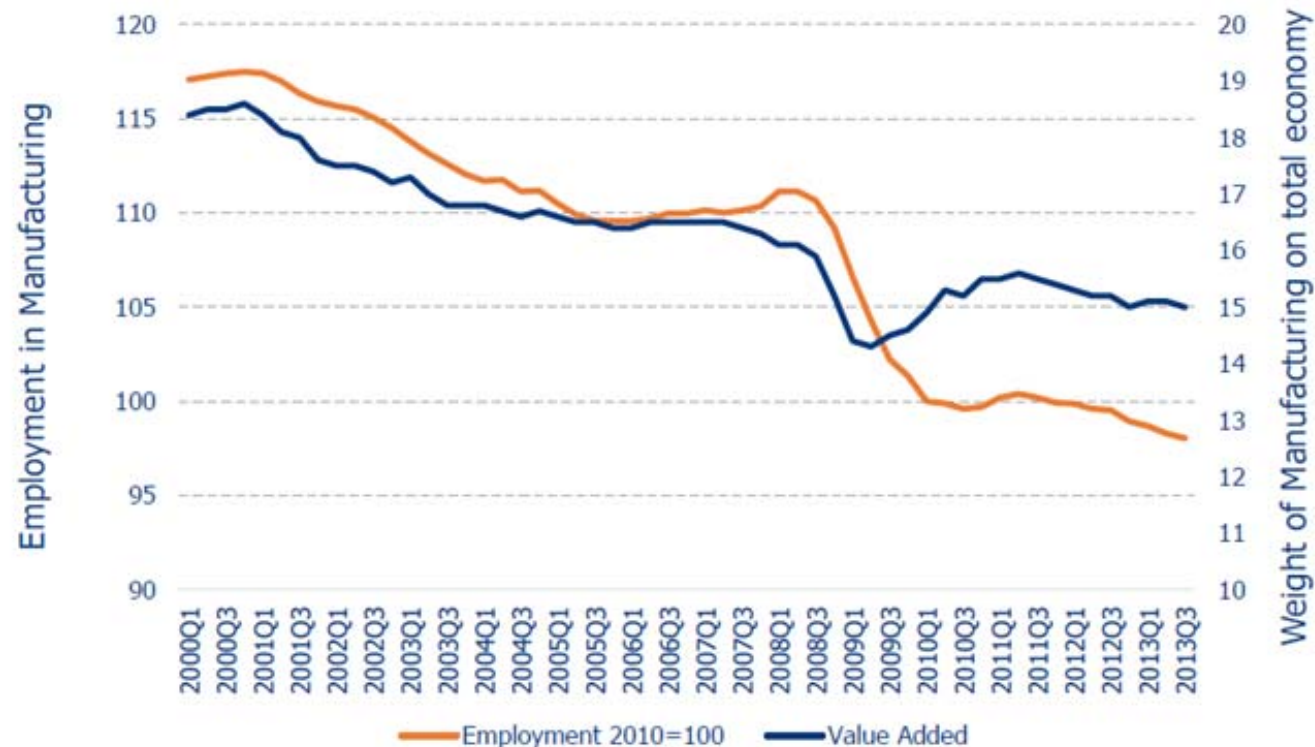
<http://ec.europa.eu/digital-agenda/en/news/definition-research-and-innovation-policy-leveraging-cloud-computing-and-iot-combination>

# Growth and Jobs in Manufacturing



But European Manufacturing is also affected by a long-term structural decline ...

**Value Added (% of total) and employment (2010=100) of Manufacturing in the EU-28, 2000Q1-2013Q3**

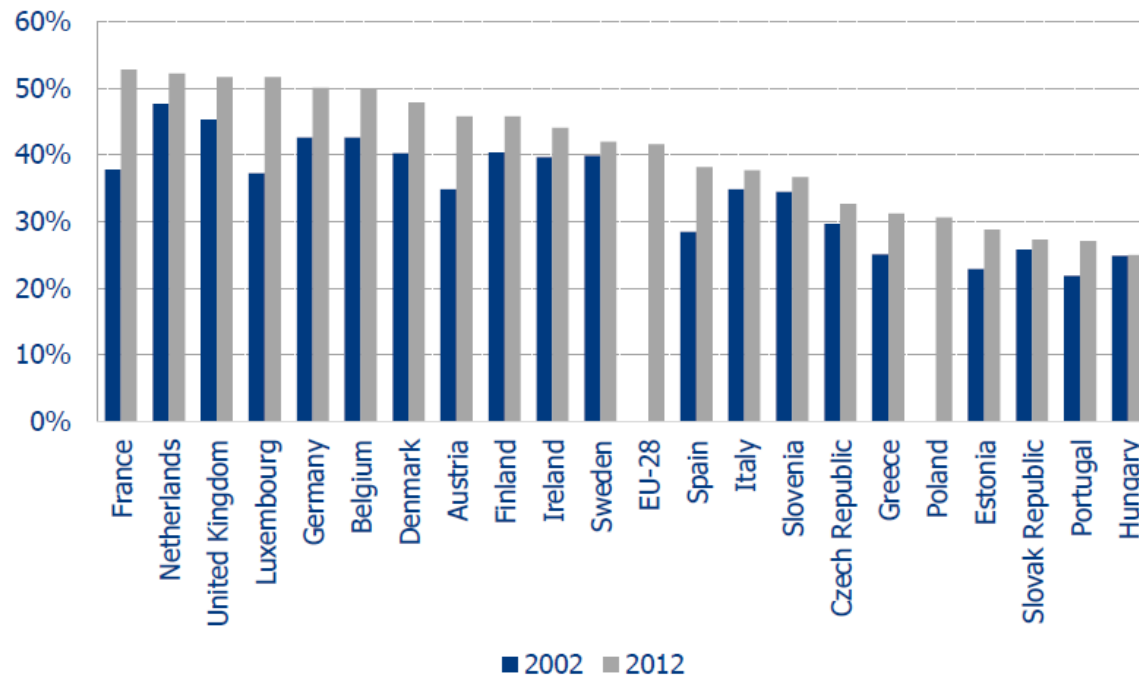


Source: The European House - Ambrosetti re-elaboration on Eurostat and AMECO data, 2014

# IOT driving Manufacturing Service Innovation EU

... as the boundaries between Manufacturing and Services are blurring

**Share of service-related jobs in the manufacturing sector, 2002-2012**



- Producing goods is becoming a **smaller part of manufacturing firms'** activities
- Manufacturing now provides a **wide spectrum of services**: from pre- and after- sales services, to design, R&D and marketing services
- Ultimately, the boundaries between Manufacturing and Services are **blurring**

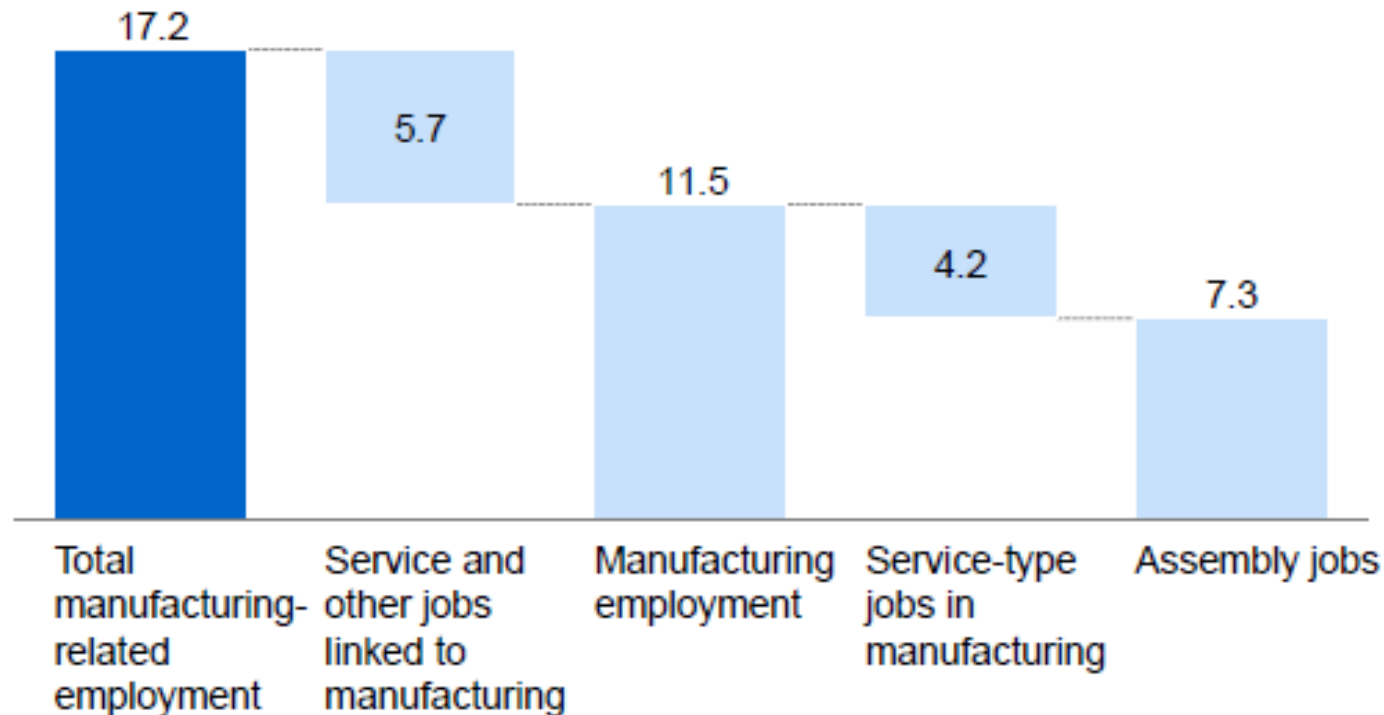
Source: The European House - Ambrosetti re-elaboration on OECD data, 2013


# IOT driving Manufacturing Service Innovation US



Manufacturing drives production and service jobs

US manufacturing employment, 2010  
Million



 @KatyMGeorge

McKinsey&Company



# Factories of the Future Partnership



- Factories of the Future is Europe's advanced manufacturing partnership
- A public-private partnership funded by Horizon 2020 (budget of €1.15 billion 2014-2020). 1st Launched under EU's FP7
- Jointly supported through European Commission's DG CONNECT & DG Research and Innovation
- Research & innovation priorities identified by industry/research community
- Over 1,000 organisations participating, High involvement of SMEs: 200+
- 180 Projects to date. 400+ results reported on EFFRA Innovation Portal



<http://www.effra.eu/> --- <http://www.effra.eu/portal>

[http://www.eurida-research.com/downloads/17.-cross-cutting\\_2016-2017\\_pre-publication.pdf](http://www.eurida-research.com/downloads/17.-cross-cutting_2016-2017_pre-publication.pdf) page 19+

# Factories of the Future 2020 Strategic Roadmap



## Research & Innovation Priorities

**Domain 1: Advanced Manufacturing Processes**  
Innovative processing for both new & current materials or products

**Domain 2: Adaptive and Smart Manufacturing Systems**  
Innovative manufacturing equipment at component & system level, including mechatronics, control & monitoring systems

**Domain 3: Digital, Virtual & Resource Efficient Factories**  
Factory design, data collection & management, operation & planning, from real-time to long term optimisation approaches

**Domain 4: Collaborative & Mobile Enterprises**  
Networked factories & dynamic supply chains

**Domain 5: Human-Centred Manufacturing**  
Enhancing the role of people in factories

**Domain 6: Customer-Focused Manufacturing**  
Involving customers in manufacturing value chain, from product process design to manufacturing associated innovative services

## Challenges & Opportunities

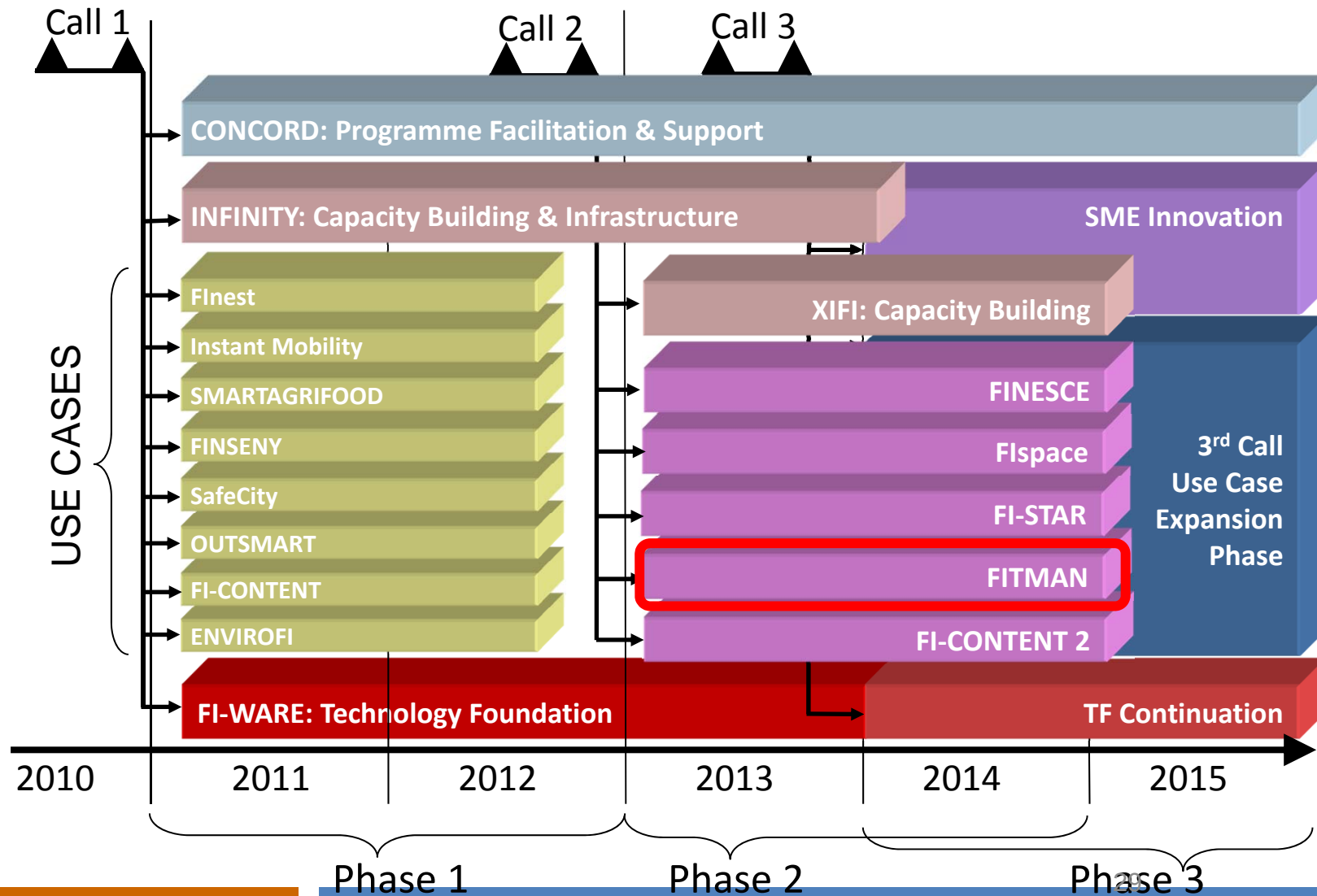
- Manufacturing Future Products
- Economic
- Social
- Environmental

Sustainability

## Technologies & Enablers

- Advanced Manufacturing Processes
- Mechatronics for Advanced Manufacturing Systems
- Information & Communication Technologies
- Manufacturing Strategies
- Knowledge Workers
- Modelling, Simulation & Forecasting

# The EU FI PPP (FIWARE) and FITMAN



[www.fiwareforindustry.eu](http://www.fiwareforindustry.eu)

# FITMAN Factsheet



Project No:	604674
Project Full Name:	<b>F</b> uture <b>I</b> nternet <b>T</b> echnologies for <b>MAN</b> ufacturing
Duration:	30 months
Start date:	April 1 <sup>st</sup> 2013
Partnership:	36 partners, 11 countries
Strategic Objective:	FP7-2012-ICT-FI FI.ICT-2011.1.8: Use Case scenarios and early trials
Total Eligible Cost:	18.034.000 EURO
EC Contribution:	12.890.000 EURO
Project Web Site:	<a href="http://www.fitman-fi.eu">www.fitman-fi.eu</a>

# FITMAN Beneficiaries



## Core Consortium (10 partners)



## Original Equipment Manufacturers (4 partners)



## SME Networks and Associated S/T (14 partners)



## Open Call winners (8 partners)





# FITMAN Results



**One FITMAN Generic Platform for Manufacturing Industries**, as a collection of several Generic Enablers

**Three FITMAN Specific Platforms** as a collection of several Specific Enablers Implementations

Smart Factory  
Platform

Digital Factory  
Platform

Virtual Factory  
Platform

**Ten FITMAN Trials Platforms** as instantiation of the selected Generic and Specific Enablers for 10 industry-driven multi-sectorial Trials



**One generic and flexible Trials Verification and Validation Framework**, encompassing concepts, methods and tools for Manufacturing Trials

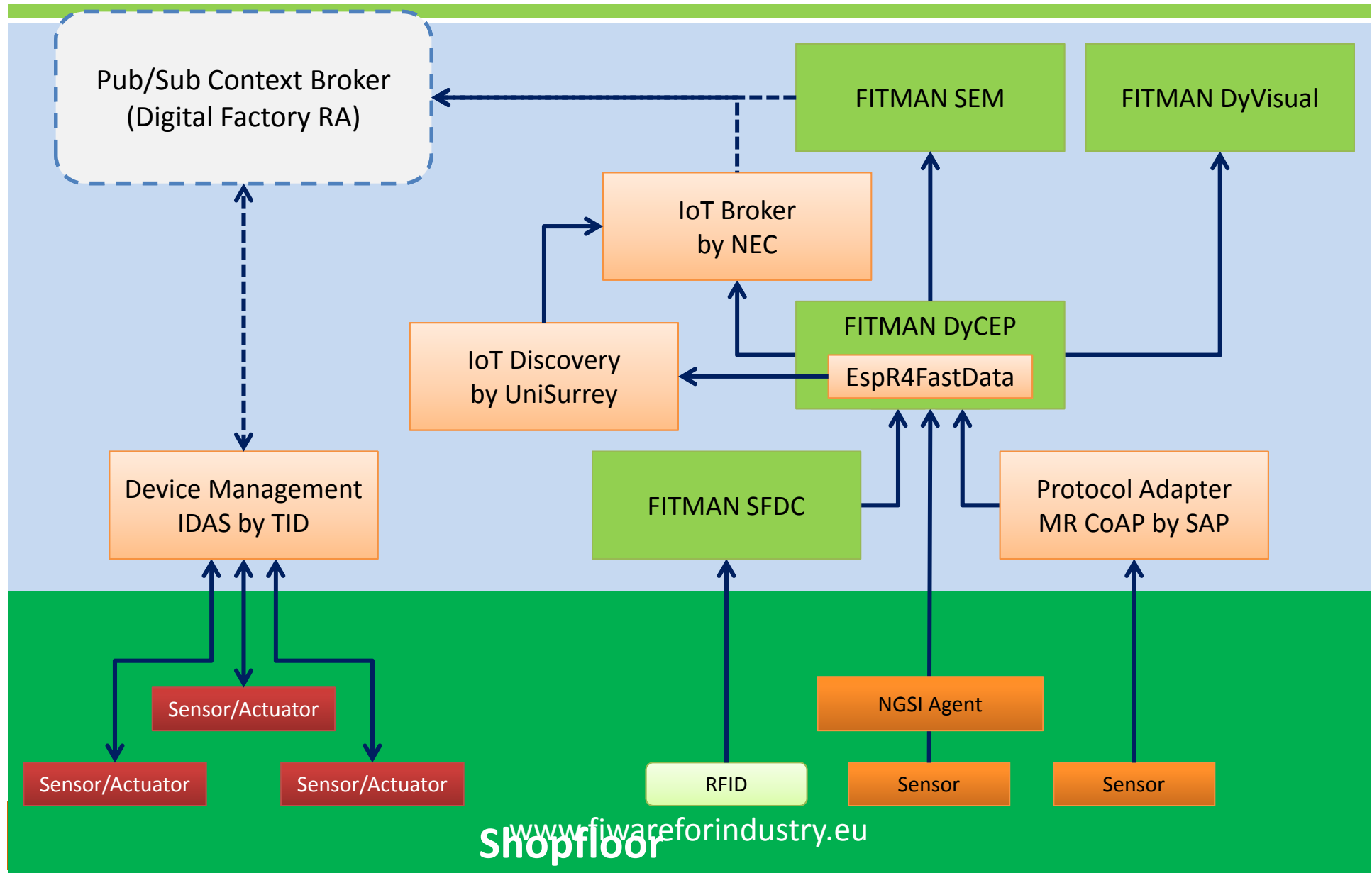


# FITMAN Reference Platforms: 14+15 Enablers

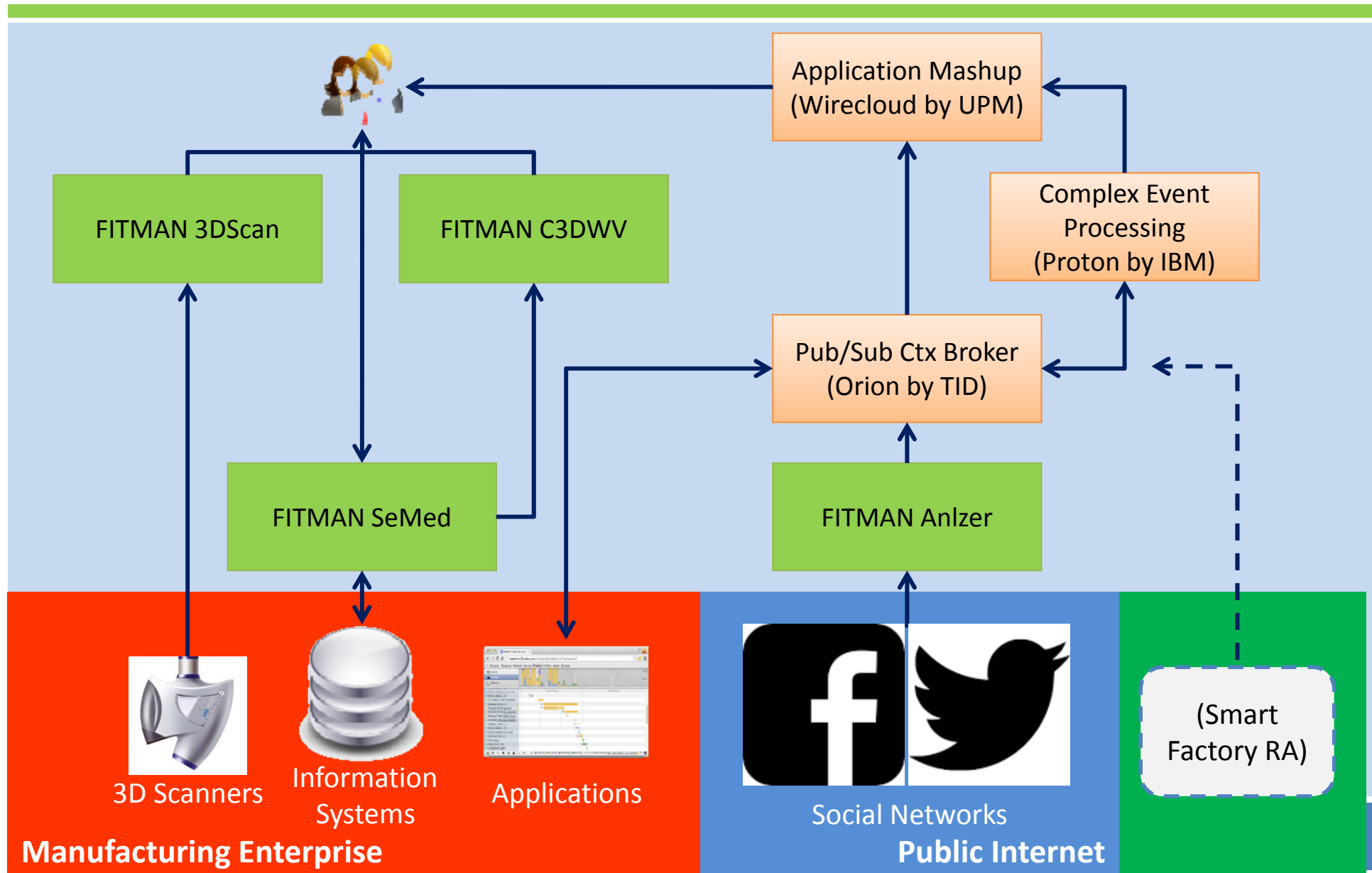


Smart Platform	Virtual Platform	Digital Platform
<p><b>GE1</b></p> <ul style="list-style-type: none"> <li>IoT.Backend.IoTBroker</li> <li>Reference Impl. by NEC</li> </ul> <p>-----</p> <p><b>GE2</b></p> <ul style="list-style-type: none"> <li>IoT.Backend.ConfMan</li> <li>Orlon Context Broker by Telefonica I+D</li> </ul> <p>-----</p> <p><b>GE3</b></p> <ul style="list-style-type: none"> <li>IoT.Backend.DeviceManagement</li> <li>IDAS by Telefonica I+D</li> </ul> <p>-----</p> <p><b>GE4</b></p> <ul style="list-style-type: none"> <li>IoT.Gateway.ProtocolAdapter</li> <li>ZPA by Telecom Italia</li> </ul> <p>-----</p> <p><b>GE5</b></p> <ul style="list-style-type: none"> <li>IoT.Gateway.DataHandling</li> <li>Esper4FastData by Orange</li> </ul> <p>-----</p> <p><b>SE1</b></p> <ul style="list-style-type: none"> <li>Shopfloor Data Collection</li> <li>SDC by Uninova &amp; ATOS</li> </ul> <p>-----</p> <p><b>SE2</b></p> <ul style="list-style-type: none"> <li>Secure Event Management</li> <li>SEM by TXT</li> </ul> <p>-----</p> <p><b>SE3</b></p> <ul style="list-style-type: none"> <li>Dynamic CEP</li> <li>DyCEP by FZI &amp; NISSATECH</li> </ul> <p>-----</p> <p><b>SE4</b></p> <ul style="list-style-type: none"> <li>Dynamic Visualization &amp; Interaction</li> <li>DyVisual by DFIG</li> </ul>	<p><b>GE1</b></p> <ul style="list-style-type: none"> <li>Apps.Marketplace</li> <li>Reference Impl. by SAP</li> </ul> <p>-----</p> <p><b>GE2</b></p> <ul style="list-style-type: none"> <li>Apps.Repository</li> <li>Reference Impl. by SAP</li> </ul> <p>-----</p> <p><b>GE3</b></p> <ul style="list-style-type: none"> <li>Apps.Mediator</li> <li>Reference Impl. by Telecom Italia / Thales</li> </ul> <p>-----</p> <p><b>GE4</b></p> <ul style="list-style-type: none"> <li>Apps.Registry</li> <li>Reference Impl. by SAP</li> </ul> <p>-----</p> <p><b>GE5</b></p> <ul style="list-style-type: none"> <li>Apps.LightSemanticComposition</li> <li>COMPEL by ATOS</li> </ul> <p>-----</p> <p><b>GE6</b></p> <ul style="list-style-type: none"> <li>Data.SemanticSupport</li> <li>Semantic Application Support by ATOS</li> </ul> <p>-----</p> <p><b>SE1</b></p> <ul style="list-style-type: none"> <li>Collaborative Asset Management</li> <li>CAM by ENG</li> </ul> <p>-----</p> <p><b>SE2</b></p> <ul style="list-style-type: none"> <li>Collaborative Business Process Management</li> <li>BPM by ENG</li> </ul> <p>-----</p> <p><b>SE3</b></p> <ul style="list-style-type: none"> <li>Supply Chain &amp; Business Ecosystem Apps</li> <li>SCApp by TXT</li> </ul> <p>-----</p> <p><b>SE4</b></p> <ul style="list-style-type: none"> <li>Data Interoperability Platform Services</li> <li>DIPS by TXT</li> </ul> <p>-----</p> <p><b>SE5</b></p> <ul style="list-style-type: none"> <li>Metadata and Ontologies Semantic Matching</li> <li>SeMa by NTUA</li> </ul> <p>-----</p> <p><b>SE6</b></p> <ul style="list-style-type: none"> <li>Management of Virtualized Assets</li> <li>MoVA by DITF</li> </ul> <p>-----</p> <p><b>SE7</b></p> <ul style="list-style-type: none"> <li>Generation and Transformation of Virtualized Assets</li> <li>GeToVA by UIBK</li> </ul>	<p><b>GE1</b></p> <ul style="list-style-type: none"> <li>Data.PubSub</li> <li>Context Awareness Platform by Telecom Italia</li> </ul> <p>-----</p> <p><b>GE2</b></p> <ul style="list-style-type: none"> <li>Apps.Application Mashup</li> <li>Wirecloud by UPM</li> </ul> <p>-----</p> <p><b>GE3</b></p> <ul style="list-style-type: none"> <li>Data.UnstructuredDataAnalysis</li> <li>UDA by ATOS</li> </ul> <p>-----</p> <p><b>SE1</b></p> <ul style="list-style-type: none"> <li>Unstructured &amp; Social Data Analytics</li> <li>Anizer by NTUA</li> </ul> <p>-----</p> <p><b>SE2</b></p> <ul style="list-style-type: none"> <li>Semantic Mediator front-end &amp; back-end</li> <li>SEMed by BIBA</li> </ul> <p>-----</p> <p><b>SE3</b></p> <ul style="list-style-type: none"> <li>3D Scanning Storage and Visualisation</li> <li>3DScan by DATAPIXEL</li> </ul> <p>-----</p> <p><b>SE4</b></p> <ul style="list-style-type: none"> <li>Collaborative 3D Web Viewer</li> <li>c3DWW by DFIG</li> </ul>

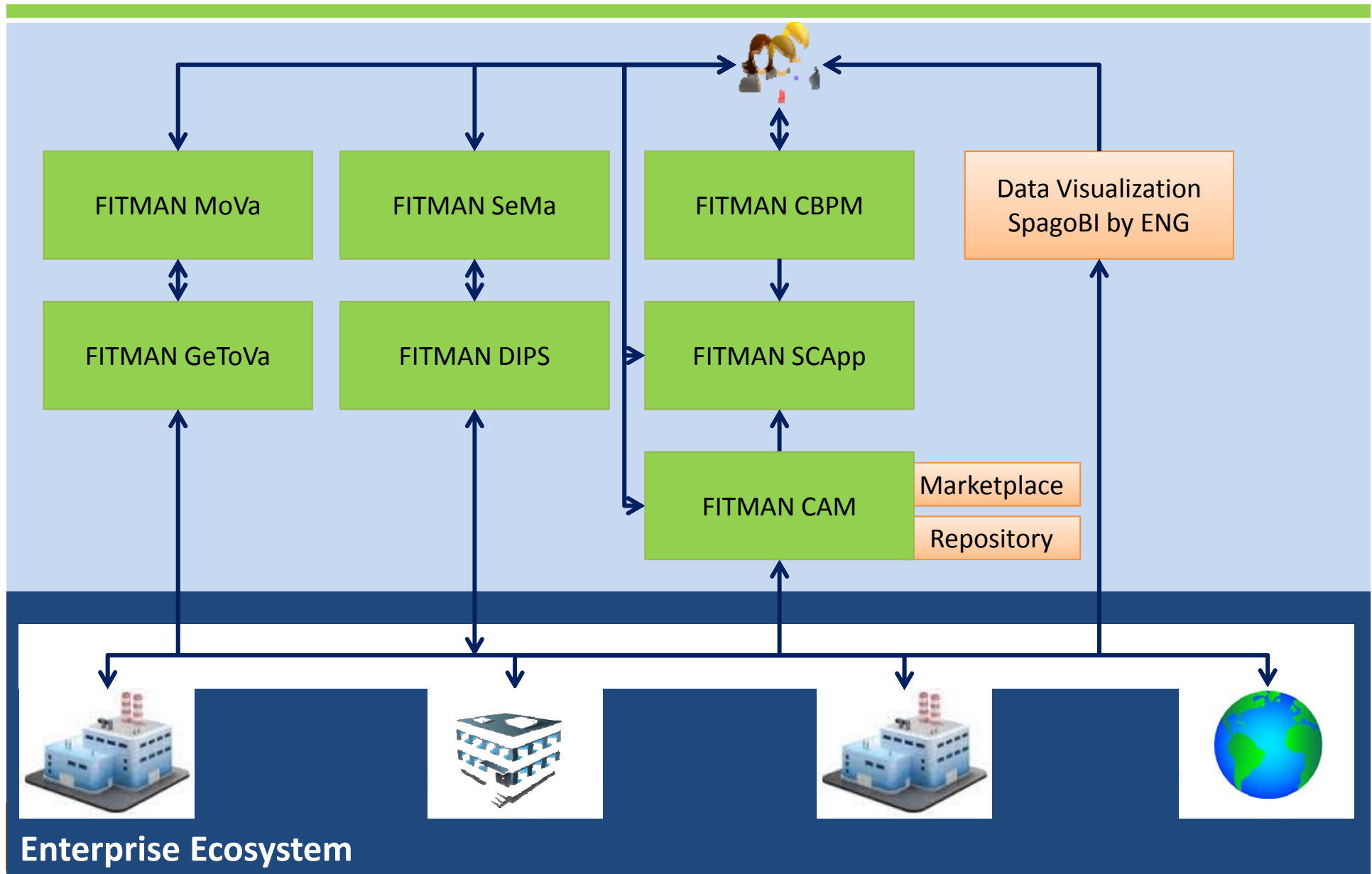
# FITMAN Smart Factory RA



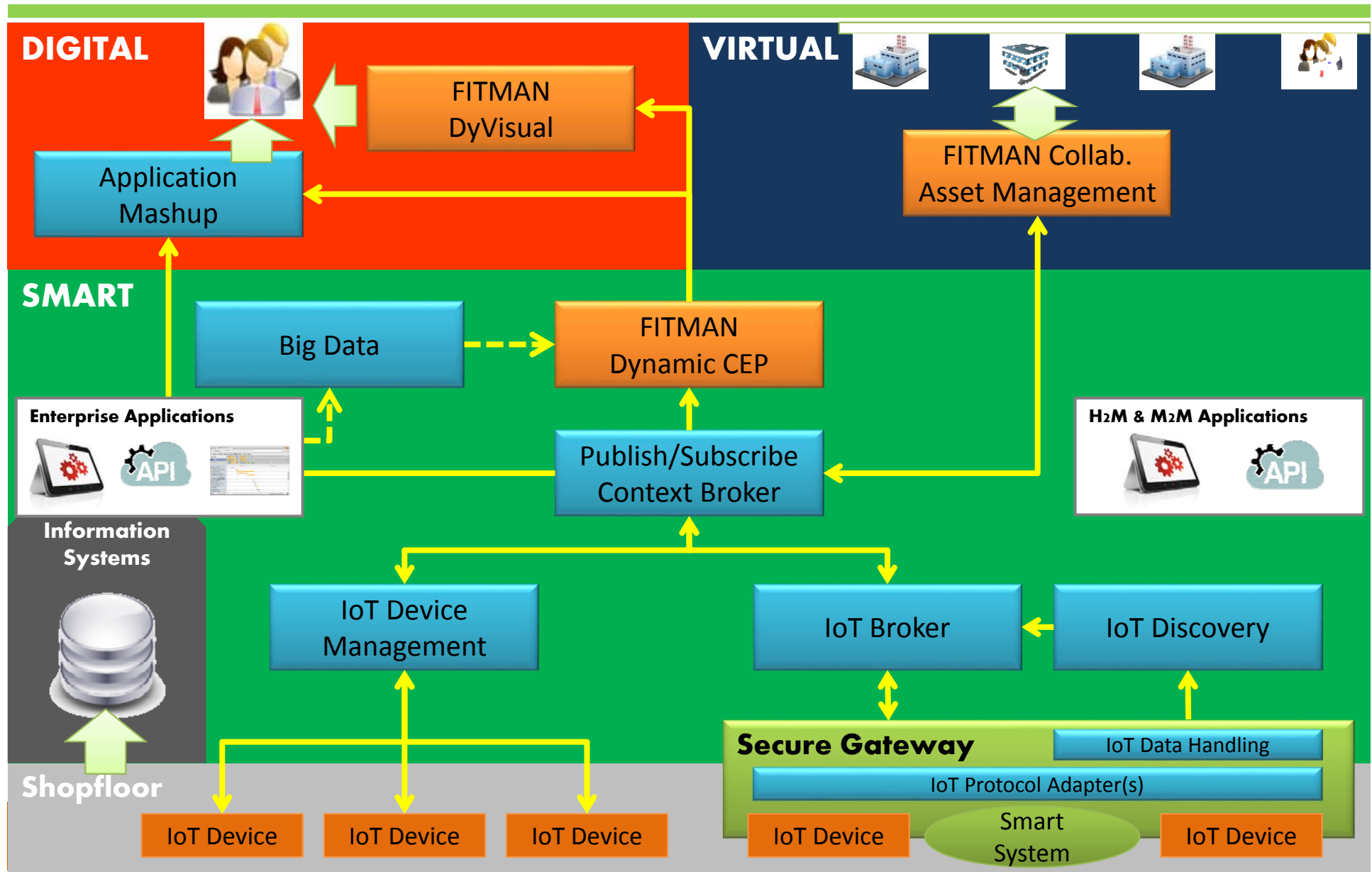
# FITMAN Digital Factory RA



# FITMAN Virtual Factory RA



# FITMAN Industrial IOT Platform



# Ten FITMAN Trials in Six Countries



## LARGE ENTERPRISES:

**D** #1 **VW** (Automotive OEM - DE)

**S** #2 **TRW** (Automotive Supplier - ES)

**S** **D** #3 **AGUSTAW** (Aeronautics - IT)

**S** #4 **Whirlpool** (White Goods - IT)

## SMEs:

**S** **V** #5 **Piacenza** (Textile - IT)

**V** #6 **APR** (Plastic - FR)

**D** #7 **Consulgal** (Construction - PT)

**V** #8 **TANet** (Resource Mgmt. - UK)

**V** #9 **COMPlus** (LED Lighting - DE)

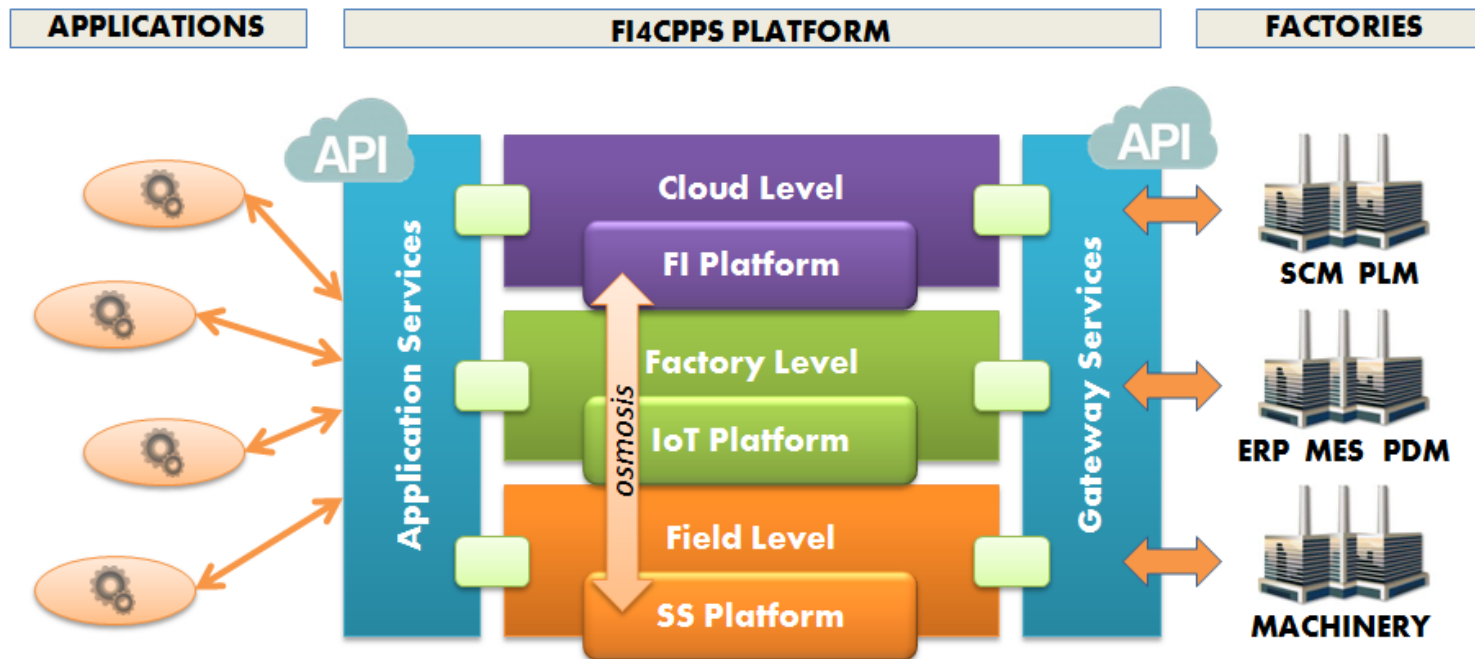
**D** #10 **AIDIMA** (Furniture - ES)



# The FIWARE-based BEinCPPS



# BE CPPS



## BEinCPPS, Business Experiments in Cyber Physical Production Systems

Coord. POLIMI, technical coordinator ENGINEERING

Regional Innovation Ecosystems in Lombardia Euskadi Norte Baden-Wuerttemberg Rhone-Alpes



# Open Call opportunity to join BEinCPPS



## **BE** in **CPPS** Business Experiments in Cyber Physical Production Systems

**Factories of the Future** obj. 9: ICT Innovation for Manufacturing SMEs;

Budget: EUR 8,000,000; Open Calls for SMEs: **EUR 2,250,000**;

Start Date: November 1<sup>st</sup> 2015 – End Date: October 31<sup>st</sup> 2018

### **OPEN CALL for APPLICATIONS EXPERIMENTS**

- i. Big Data RT Decision Support, Planning
- ii. Cyber-physical High speed Ramp-up
- iii. Energy efficient Manufacturing
- iv. Zero Defect Manufacturing
- v. Smart Logistics Applications
- vi. Visualisation and Training at workplace
- vii. End of Life in a Circular Economy
- viii. CPS equipment development integration

Up to 80k per experimentation project

OPEN DATE MAY 2<sup>nd</sup> CLOSURE JUNE 15<sup>th</sup>

[www.beincpps.eu](http://www.beincpps.eu)



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MILANO 1863





# The Sensing Enterprise - Enterprise Information Systems in the Internet of Things

*Invited Lecture*

*28<sup>th</sup> April 2016*

*ICEIS 2016, International Conference of Enterprise Information Systems, Roma*

*Sergio Gusmeroli, ENGINEERING Ingegneria Informatica S.p.A*  
*sergio.gusmeroli@eng.it*

