



Implementing Factories of the Future and Industry 4.0 paradigms: the role of data-driven skills and blue collar workers' education

17th November 2015

European Data Forum 2015

Session 6, Educating Data Scientists and Data Skills

Sergio Gusmeroli, FITMAN Coordinator sergio.gusmeroli@txtgroup.com



LUXEMBOURG
16-17 NOVEMBER 2015



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Manufacturing Renaissance in EU

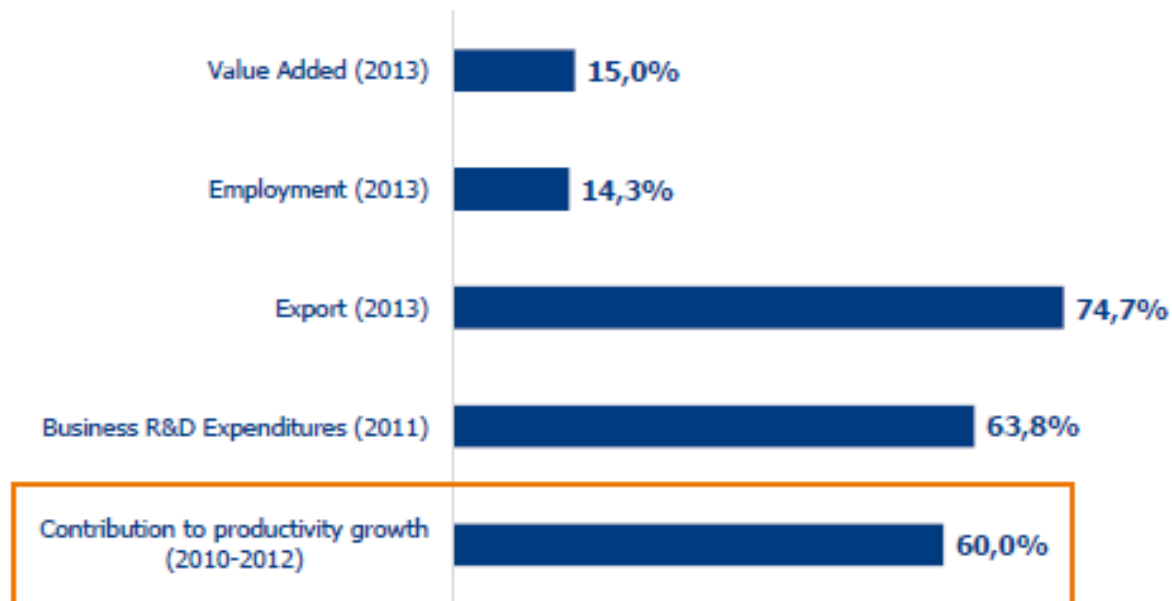


World Manufacturing Forum



... 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

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



Speech of Commissioner Oettinger at Hannover Fair 14 April 2015

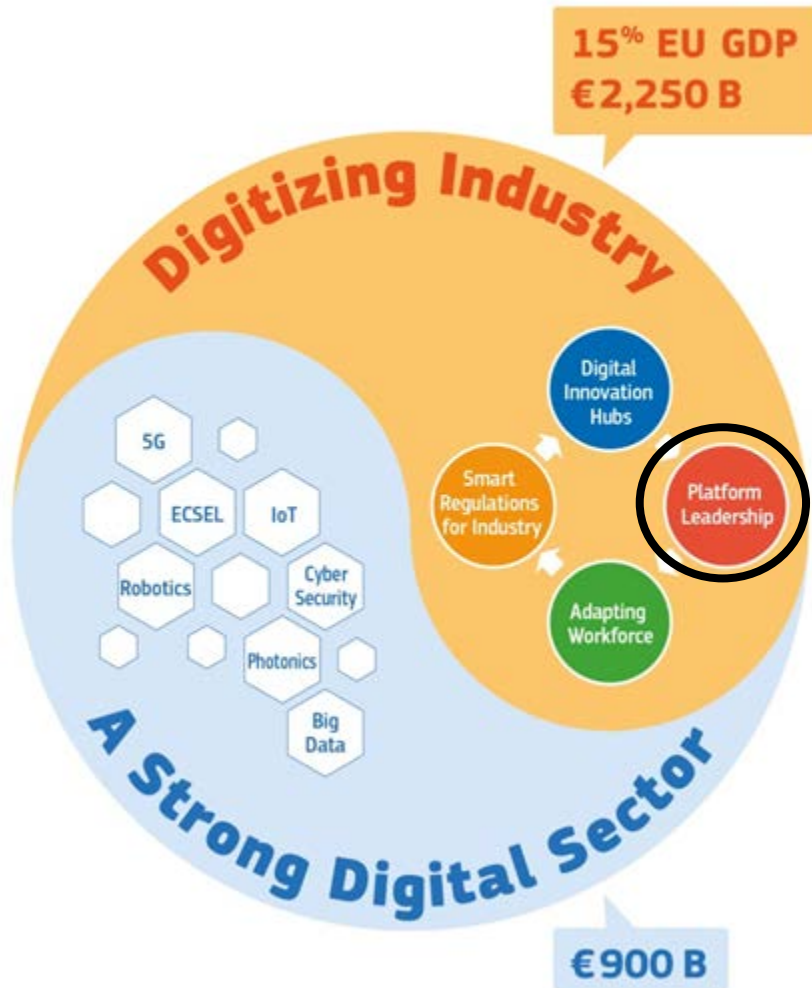
*Objective: Making sure that any industry in Europe, wherever it is located, can make the best use of **digital technologies** while adapting our workforce to the change*

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

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

IT vs. Manufacturing Innovation: Platform Leadership and FITMAN



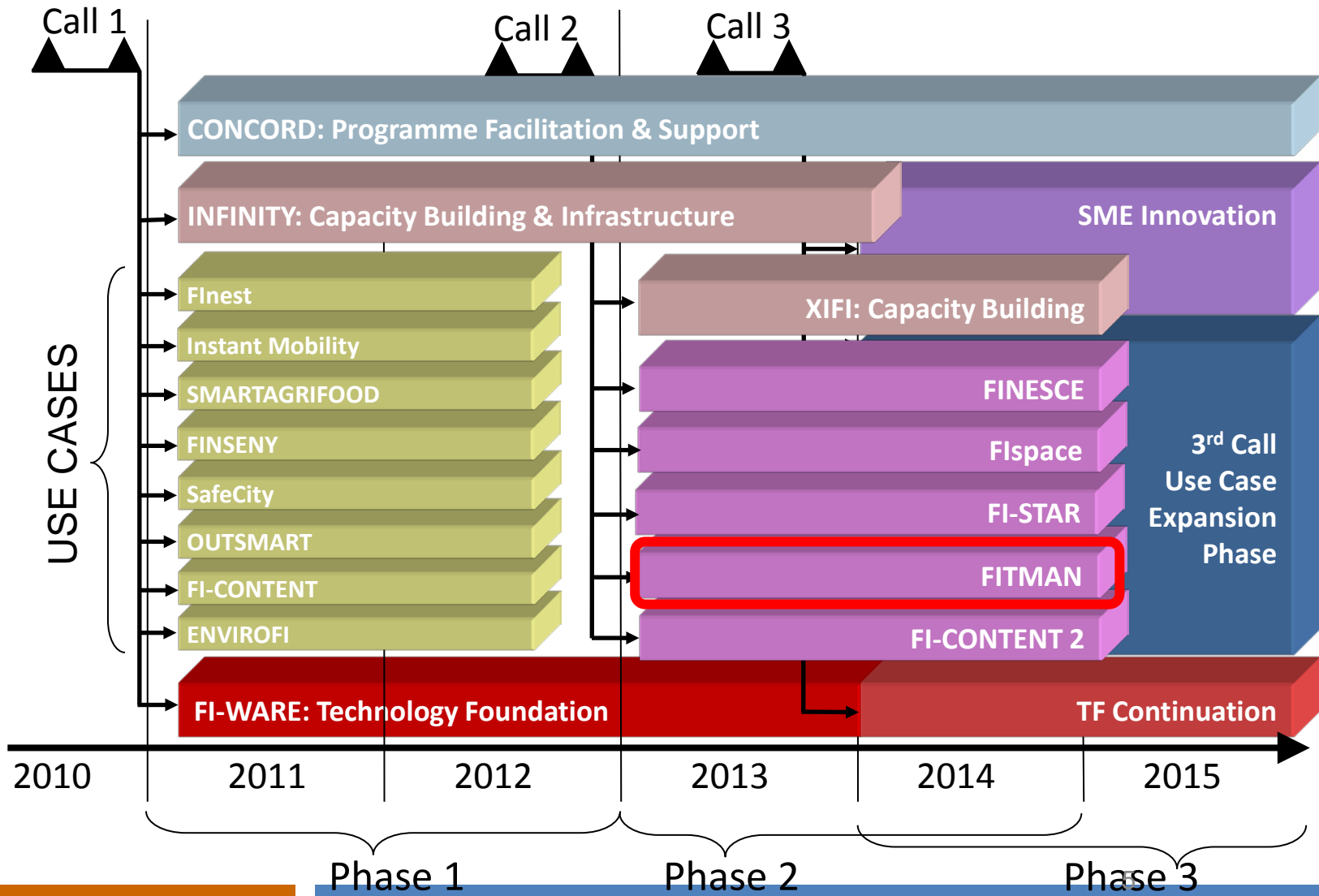
Oettinger EU Strategy in order to "ensure that all industrial sectors make the best use of new technologies and manage their transition towards higher value digitised products and processes.

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)*



The EU FI PPP (FIWARE) and FITMAN



FITMAN Factsheet



Project No:	604674
Project Full Name:	F uture I nternet T echnologies for MAN ufacturing
Duration:	24 months (possible extension to 30 months)
Start date:	April 1 st 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:	www.fitman-fi.eu

FITMAN Beneficiaries



Core Consortium (10 partners)



Original Equipment Manufacturers (4 partners)



SME Networks and Associated S/T (14 partners)



Open Call winners (8 partners)

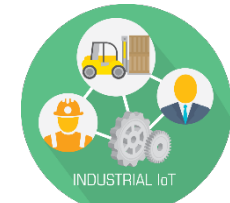


FITMAN Results



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

Four FITMAN Specific Platforms as a collection of several Specific Enablers Implementations



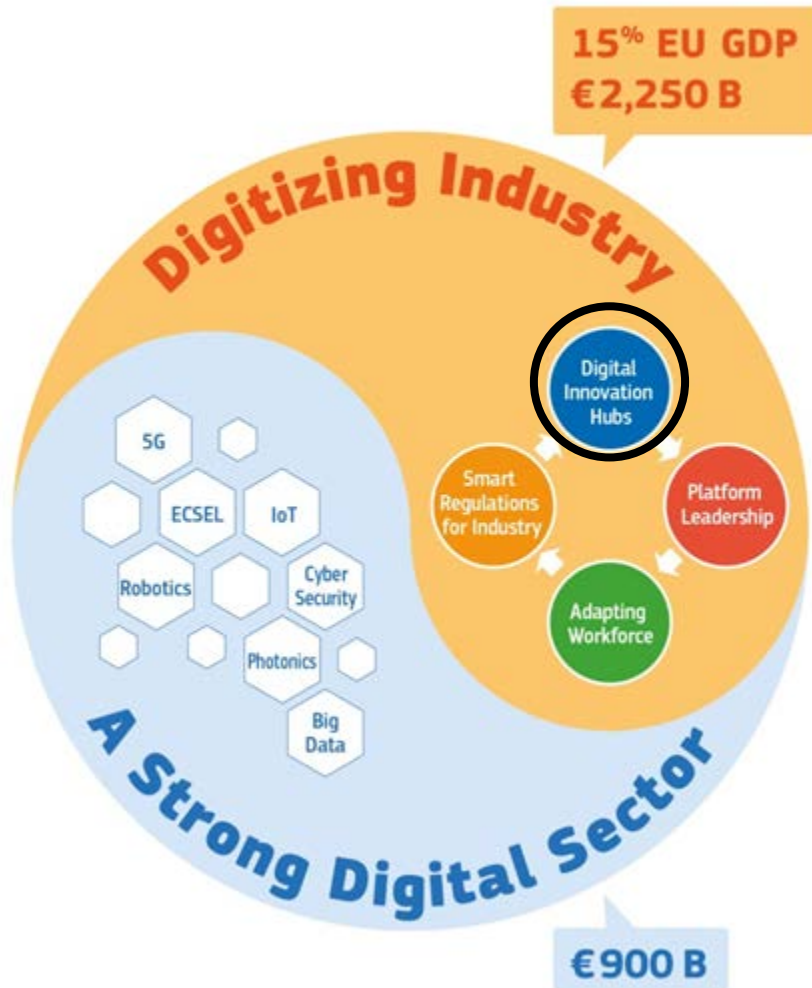
Ten FITMAN Trials Platforms as instantiation of the selected Generic and Specific Enablers for 10 industry-driven multi-sectorial Trials



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

IT vs. Manufacturing Innovation:

Digital Innovation Hubs: the I4MS programme

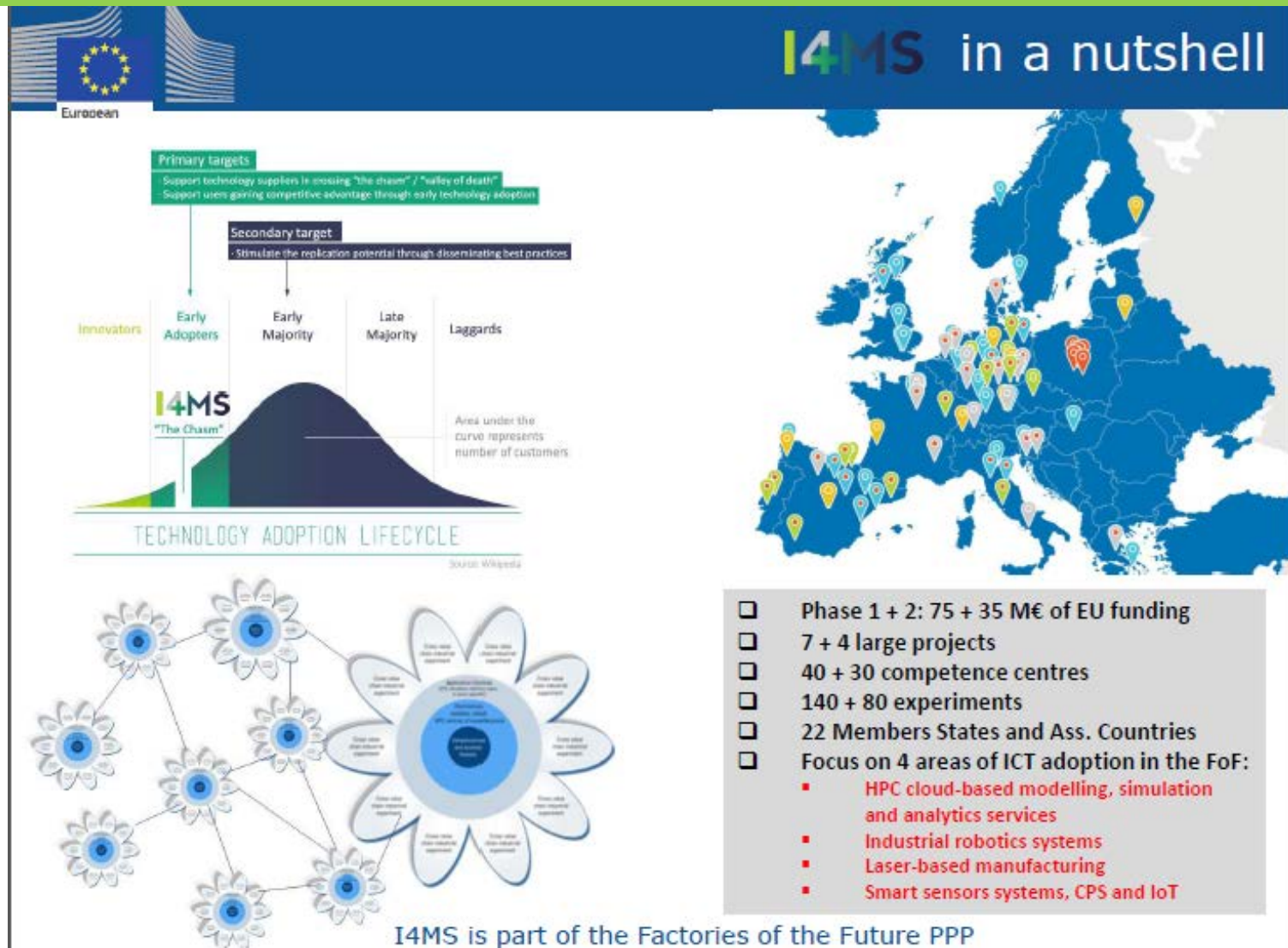


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Factories of the Future: I4MS



Innovation Hubs in CPS and IOT: BEinCPPS



BEⁱⁿCPPS 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 (provisional): November 1st 2015 – End Date: October 31st 2018

A Consortium of 23 partners performing CPPS experimentations in 5 regions (Lombardia, Euskadi, Baden Württemberg, Norte, Rhône Alpes) with Competence Centers, Industries, IT partners, SMEs Technology Transfer bodies)

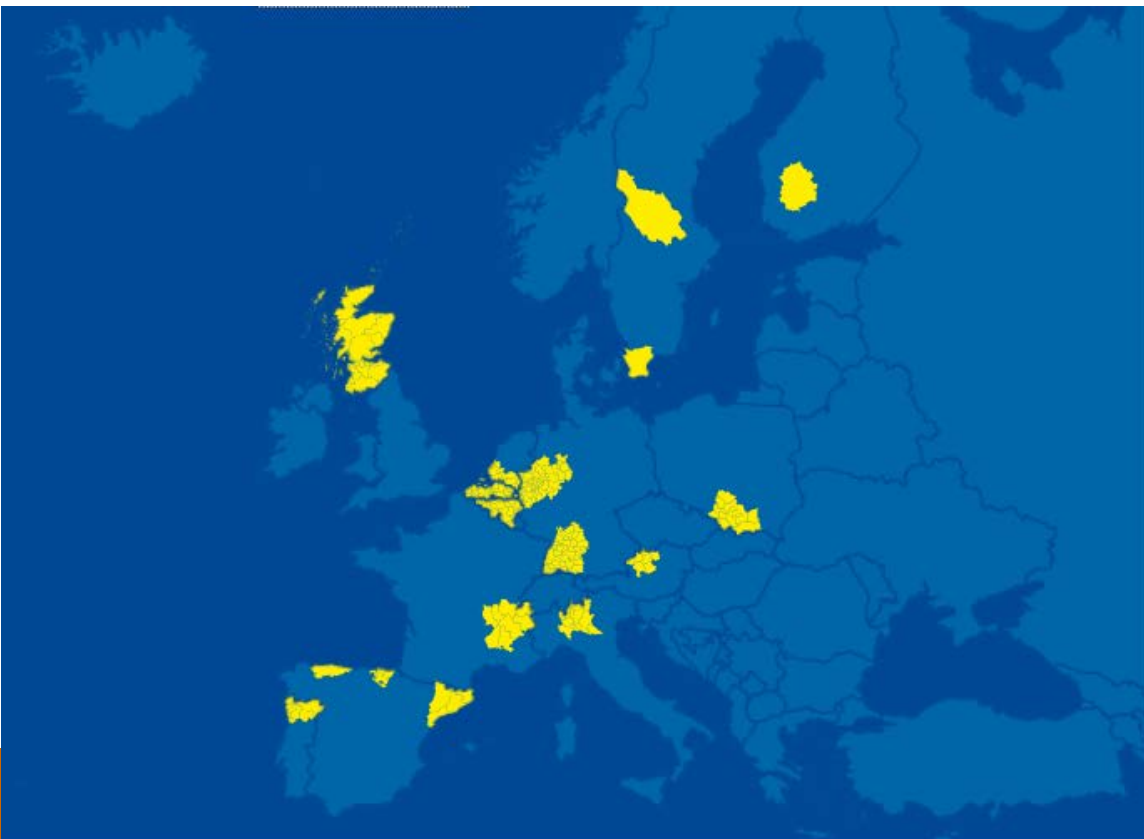
- **Phase I:** 5 Big Industrial Champions involving their value chain SMEs
- **Phase II:** Open Call for additional platform / application providers (800k for IT SMEs)
- **Phase III:** pan-EU Open Call for replications of the champions in other sectors / domains / regions (1.2M for MANUFACTURING SMEs)



POLITECNICO
MILANO 1863



Smart Specialisation is a new innovation policy concept to boost regional innovation in order to achieve economic growth and prosperity, by enabling regions to focus on their strengths. The '**Vanguard Initiative** (VI) for New Growth through Smart Specialisation' seeks to better position and embed the smart specialisation agenda within relevant EU policy frameworks. <http://www.s3vanguardinitiative.eu/>



WHIRLPOOL Washing Machines:
Quality Control system

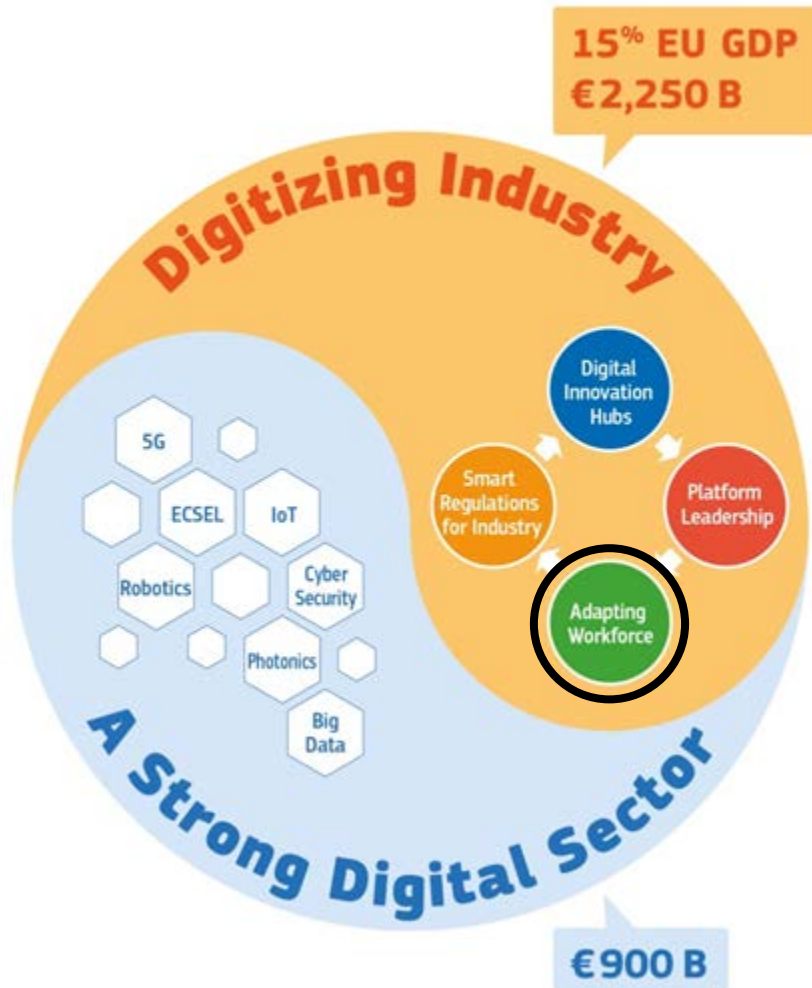
MAIER S.A Plastic Components:
Process Optimisation

JOHN DEERE Agro Technologies:
Personalized Manufacturing

KYAIA Footwear Manufacturing:
Internal Logistics Automation

PERNOUD Steel Moulds:
Diagnosis and Maintenance

IT vs. Manufacturing Innovation: Workforce re- and up-skilling



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TEL for Manufacturing in FP7 H2020



Current projects



Screen Clipping

Learning analytics, serious games, multimedia repositories, mobile / wearable / interaction technologies, Living Lab approach....

Manufacturing Competitiveness: factors



MANU SKILLS



Table 3b: Global CEO Survey: Global drivers of manufacturing competitiveness index ranking

Executives rank key drivers that impact a country's ability to compete in manufacturing

Overall rank (1-10)	Overall index score	Main driver	Most important sub-components	Sub-component rank (1-40)
	10.00	Talent-driven innovation	Quality and availability of researchers, scientists, and engineers Quality and availability of skilled labor	1 2
2	8.42	Economic, trade, financial and tax system	Tax rate burden and system complexity Clarity and stability of regulatory, tax and economic policies	3 5
3	8.07	Cost and availability of labor and materials	Cost competitiveness of materials Availability of raw materials	11 21
4	7.76	Supplier network	Cost competitiveness of local suppliers Ability of supply base to innovate in products and processes	8 9
5	7.60	Legal and regulatory system	Stability and clarity in legal and regulatory policies Labor laws and regulations	7 13
6	6.47	Physical infrastructure	Quality and efficiency of electricity grid, IT and telecommunications network Quality and efficiency of roads, airports, ports, and railroad networks	4 16
7	6.25	Energy cost & policies	Cost competitiveness of energy Ongoing investments to improve and modernize energy infrastructure	14 20
8	3.99	Local market attractiveness	Size and access of the local market Intensity of local competition	27 36
9	2.48	Healthcare system	Cost of quality healthcare for employee and society Regulatory policies (e.g., pollution, food safety, etc.) that are enforced to protect public health	26 33
10	1.00	Government investments in manufacturing and innovation	Government investments in R&D: science, technology, engineering and manufacturing Private and public sector collaboration for long-term investments in R&D: science, technology, engineering and manufacturing	29 30

Source: Deloitte Touche Tohmatsu Limited and U.S. Council on Competitiveness, 2013 Global Manufacturing Competitiveness Index
Note: See Appendix B1 for full list of 40 sub-components and associated ranking

Skills Shortage in EU manufacturing



Alarm over skills shortage in Europe

FINANCIAL TIMES

By Richard Milne, FT.com

May 27, 2013 — Updated 0256 GMT (1056 HKT)



An employee of German industrial giant Siemens works on an ICE 3 high speed train.

STORY HIGHLIGHTS

- European industrialists warn a growing skills shortage threatens their competitiveness
- Some of Europe's biggest

(Financial Times) -- European industrialists are sounding the alarm over a growing skills shortage on the continent that threatens their competitiveness and leaves manufacturing companies scrambling to find enough engineers.

Which Skills Shortage in manufacturing?



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

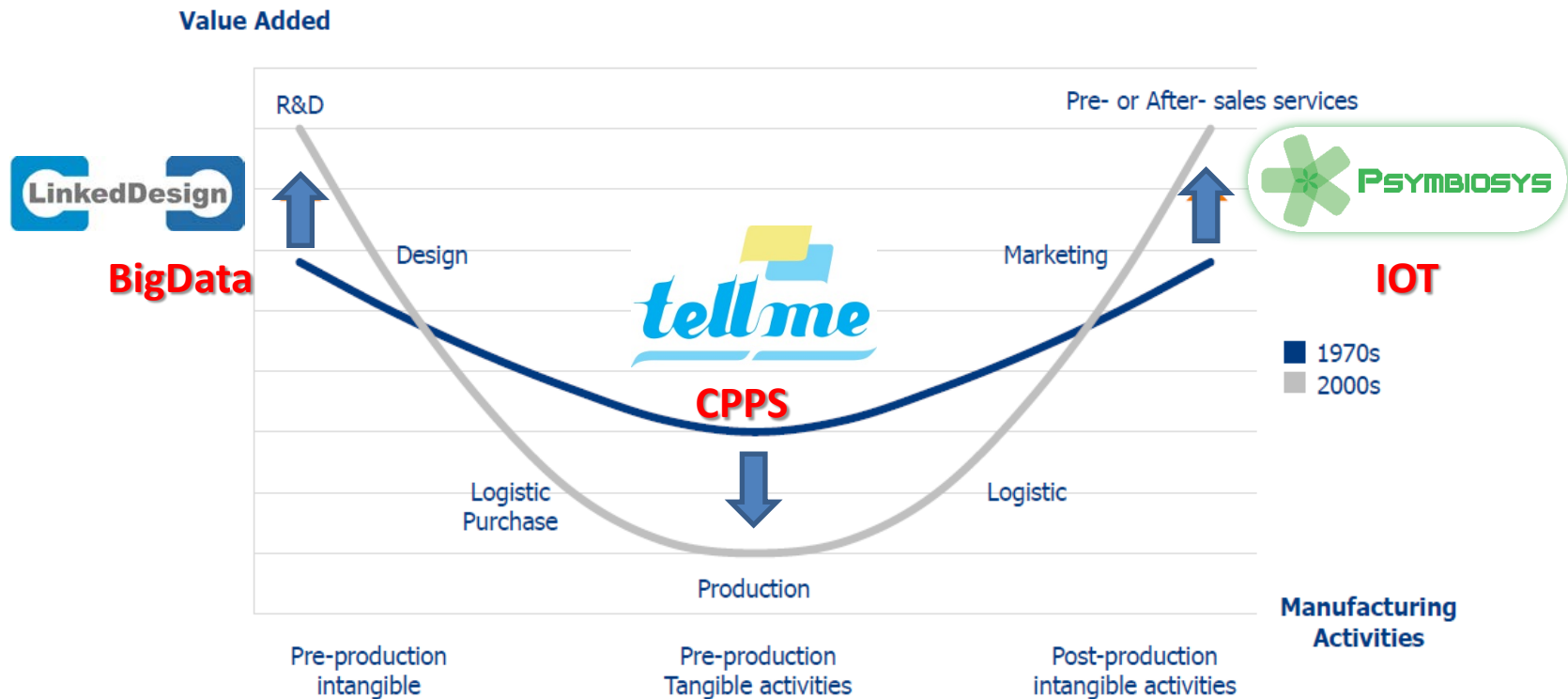


Source: Compilation, Adecco Institute Demographic Fitness Surveys 2007-2008

Manufacturing evolution 1970s-2000s



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



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