PSYMBIOSYS

IoT and the fourth Industrial Revolution

Geneve, June 8th 2017

Sergio Gusmeroli - Politecnico di Milano

PSYMBIOSYS project

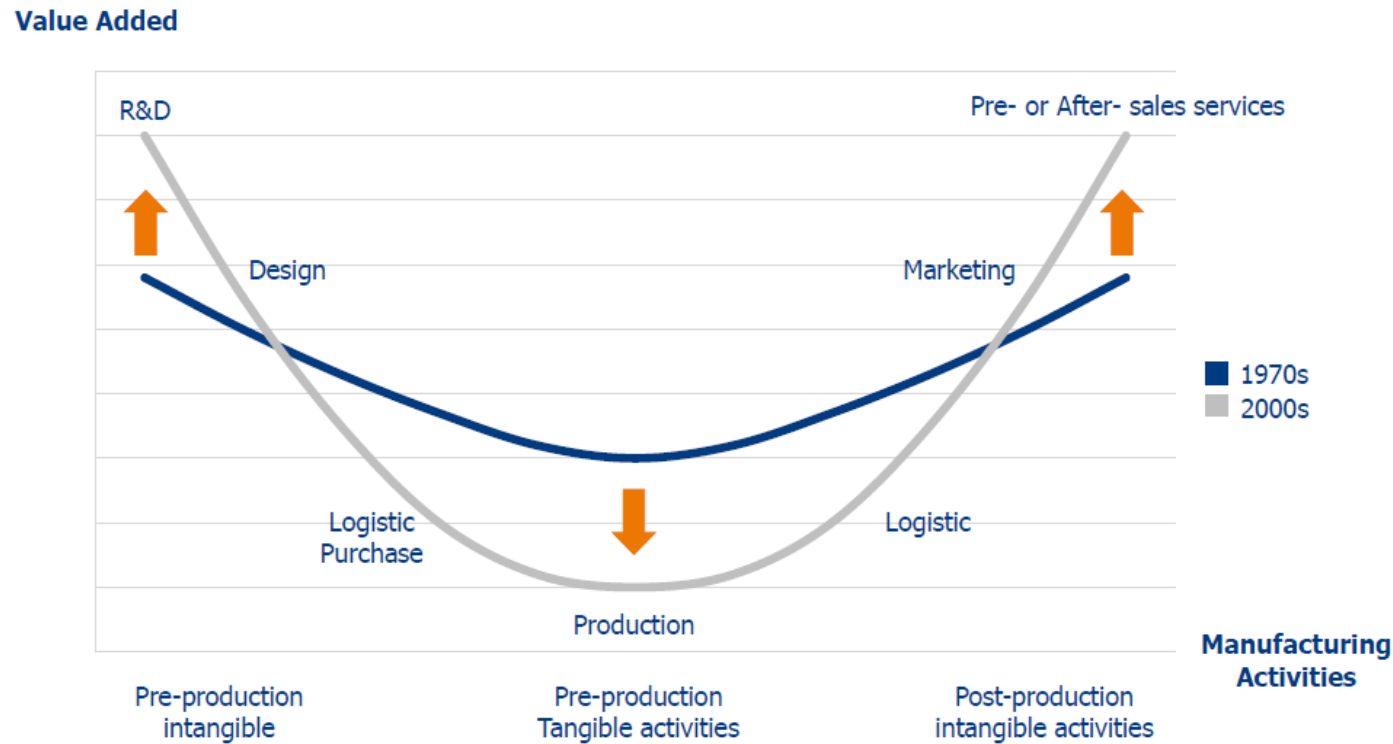|	
Project No:	636804
Project Full Name:	Product-Service sYMBIOtic SYStems
Duration:	36 months
Start date:	February 1st, 2015
Partnership:	13 partners, 6 countries
Strategic Objective:	FoF-05-2014: Innovative Product-Service design using manufacturing intelligence
Total Eligible Cost:	5.996.304 EURO
EC Contribution:	5.996.304 EURO

Brussels, June 2017

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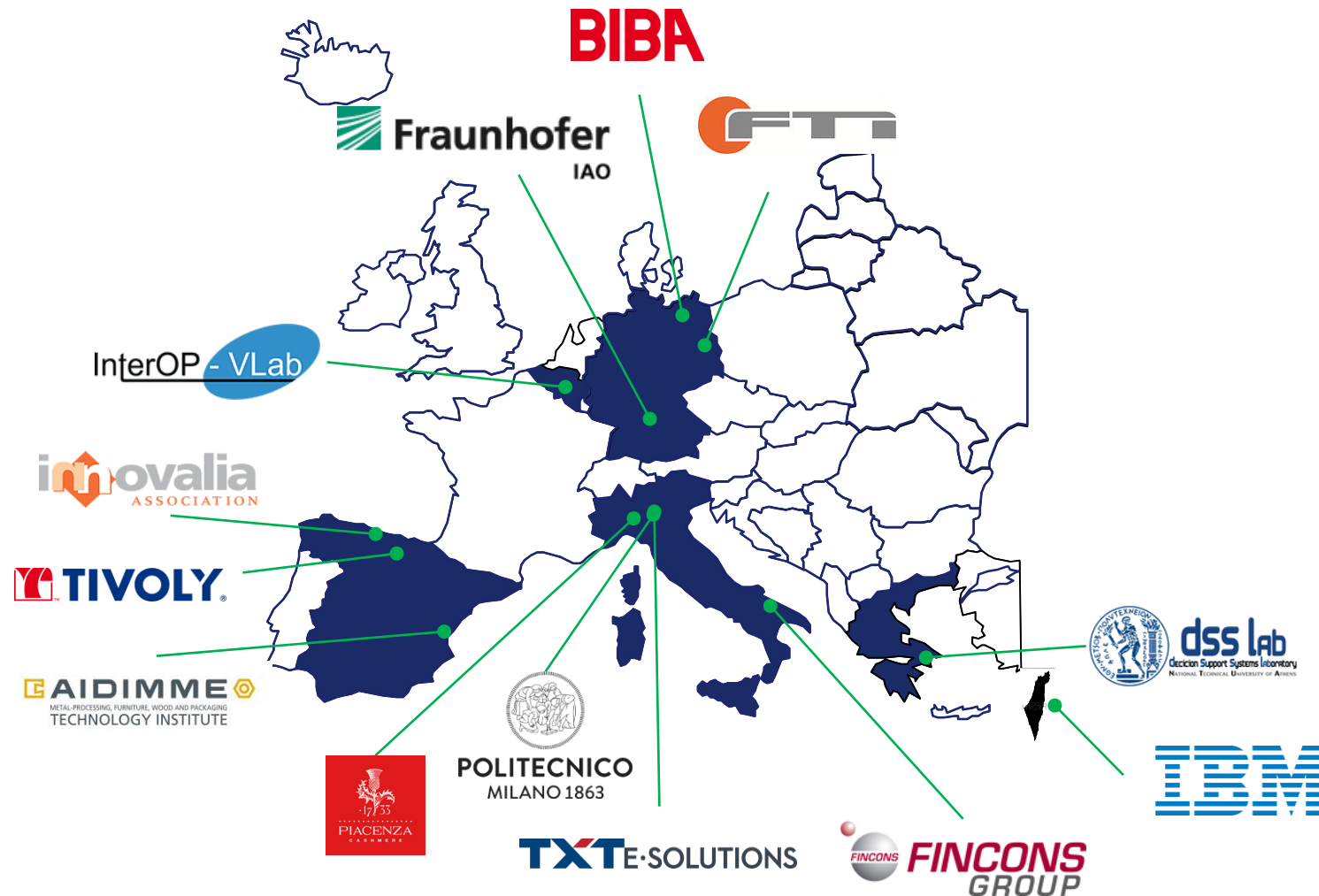
The "SMILE" challenge: European businesses must focus on high value added activities

Value Added

R&D

Pre- or After- sales services

Design

Marketing

Logistic Purchase

Logistic

Production

■ 1970s
■ 2000s

Manufacturing Activities

Pre-production intangible

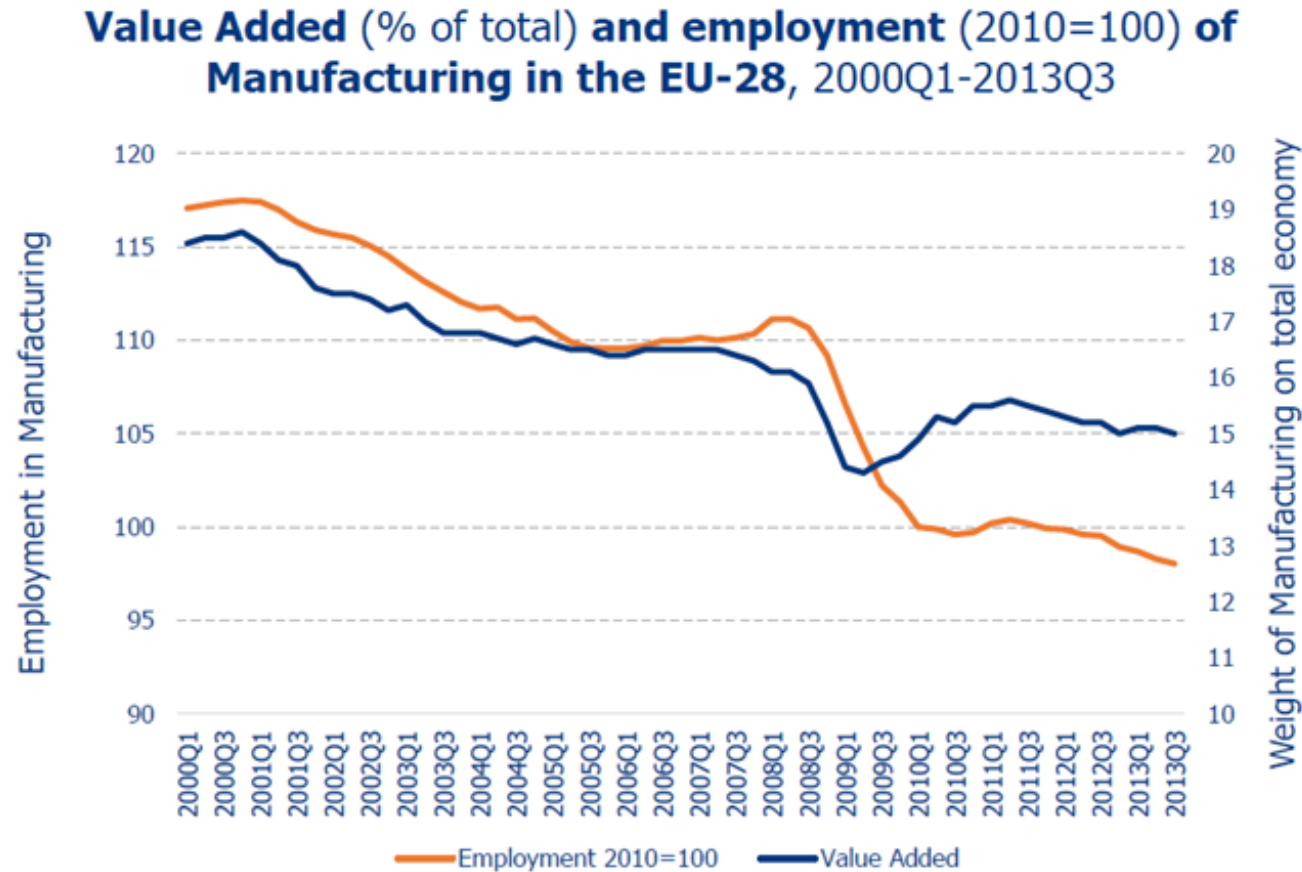Pre-production Tangible activities

Post-production intangible 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

World Manufacturing Forum 2014

Brussels, June 2017

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

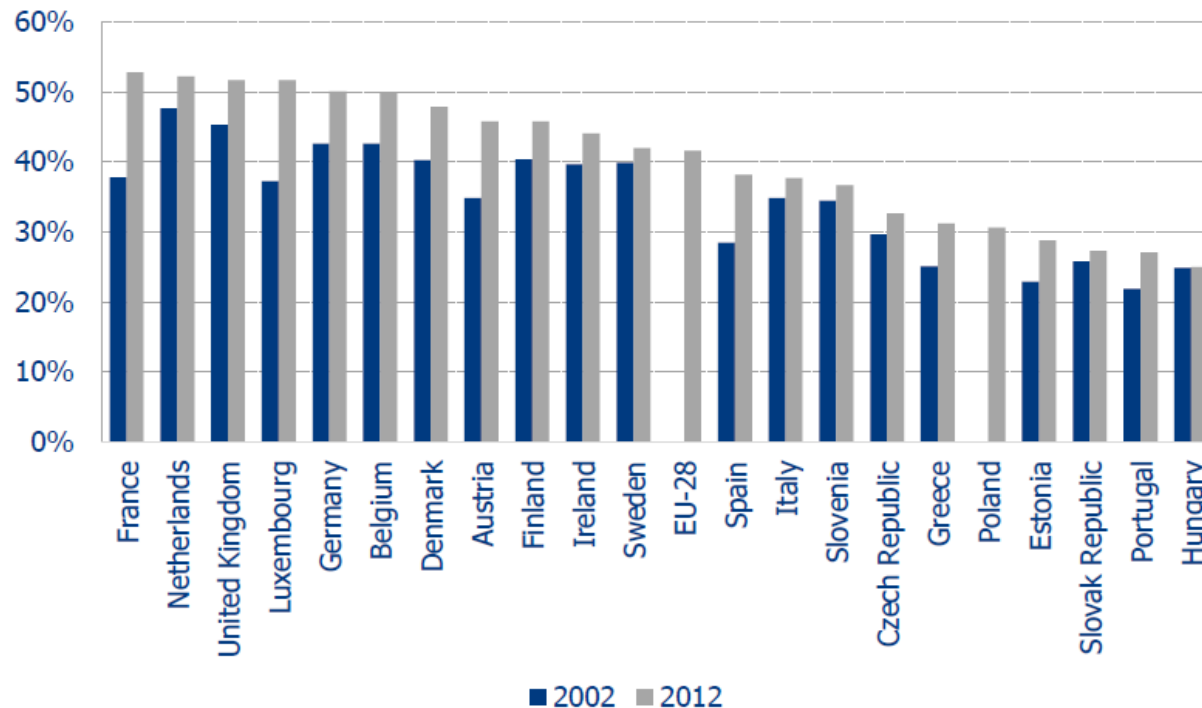— Employment 2010=100   — Value Added

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

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... 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**

World Manufacturing Forum 2014

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

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Industry 4.0: Roland Berger perspective
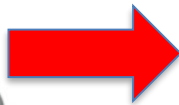
The Industrie 4.0 transition

How it reshuffles the economic, social and industrial model

World Manufacturing Forum

Max Blanchet   Roland Berger

April 2016

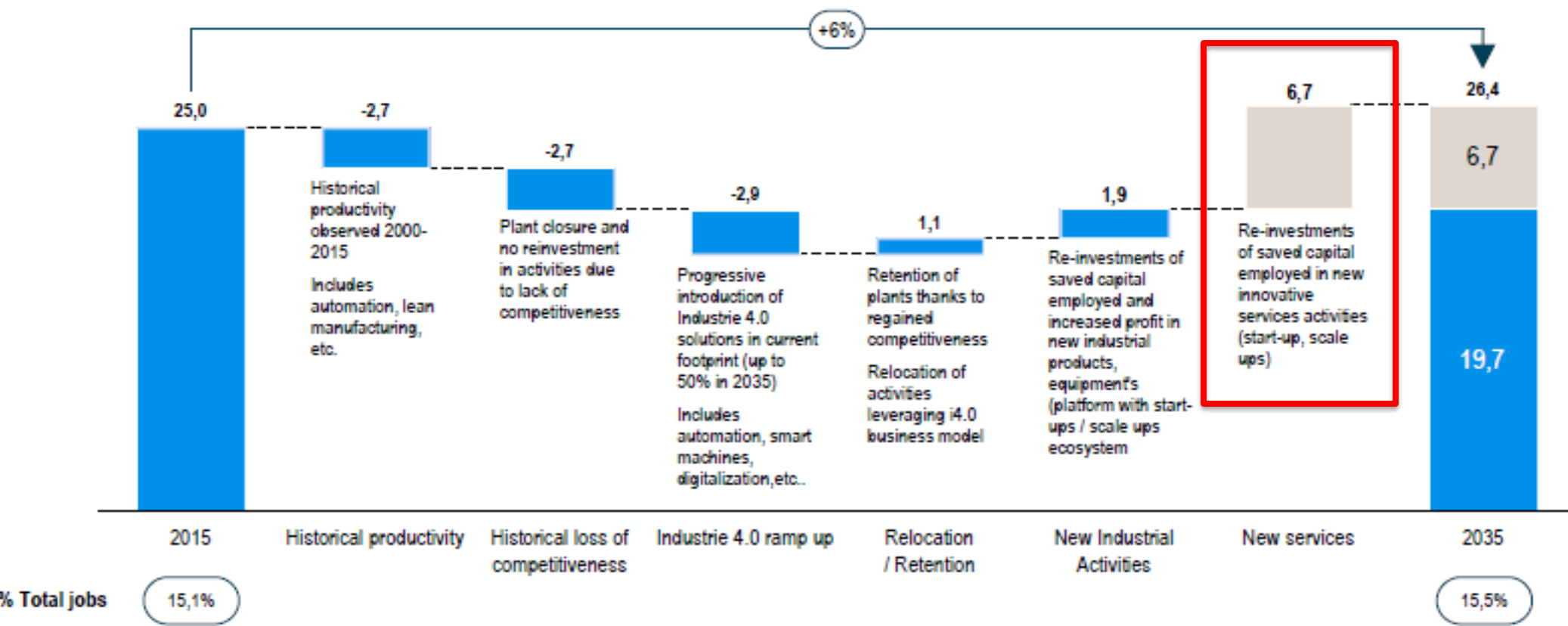### Industrie 4.0 is changing the paradigm of manufacturing strategy

Characteristics of new Industrie 4.0

1	FROM MASS PRODUCTION TO MASS CUSTOMIZATION	Flexible production, short production lead time enabling new business models emergence and affordable customization
2	FROM VOLUME SCALE EFFECT TO LOCALIZED & FLEXIBLE UNITS	From large factories specialized per product in LCC to smart factories with high technological equipment enabling to produce at competitive cost everywhere
3	FROM PLANNED MAKE TO STOCK TO DYNAMIC MAKE TO ORDER	From an organized production, based on planning and forecast and supported by stocks, to dynamic production and yield management, on demand
4	FROM PRODUCT TO USAGE	Integrated conception, services being a key element of the business model/ decision factor
5	FROM COST DRIVEN TO ROCE DRIVEN	Higher ROCE for lower Capital employed as complexity is transferred on numeric
6	FROM TAYLORISM TO FLEXIBLE WORK ORGANIZATION	Remote work (augmented reality, permanent connectivity), Tasks parallelism, flexible organization and management
7	FROM HARD WORKING CONDITIONS TO ATTRACTIVE WORK SPACE	Development of complex artisanal production, with clean/ highly connected work space, white collars intensive

WMF 2016 BARCELONA
World Manufacturing Forum

Industry 4.0: Expectations on EU Jobs

Roland Berger

Employment destruction / creation in Europe following Industrie 4.0 implementation in 2035

Industrie job destruction and creation [millions, Western Europe]

+6%

| 2015 | Historical productivity | Historical loss of competitiveness | Industrie 4.0 ramp up | Relocation / Retention | New Industrial Activities | New services | 2035 |

25,0 -2,7 -2,7 -2,9 1,1 1,9 6,7 26,4
6,7
19,7

Historical productivity observed 2000-2015 — Includes automation, lean manufacturing, etc.

Plant closure and no reinvestment in activities due to lack of competitiveness

Progressive introduction of Industrie 4.0 solutions in current footprint (up to 50% in 2035) — Includes automation, smart machines, digitalization, etc.

Retention of plants thanks to regained competitiveness — Relocation of activities leveraging i4.0 business model

Re-investments of saved capital employed and increased profit in new industrial products, equipment's (platform with start-ups / scale ups ecosystem)

Re-investments of saved capital employed in new innovative services activities (start-up, scale ups)

% Total jobs   15,1%   15,5%

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Smart Service Welt

acatech
NATIONAL ACADEMY OF
SCIENCE AND ENGINEERING

Tomorrow

Operator production — Operator production — Operator production

Service provider — Service provider — Intermediary

Marketplace | Service platform | Knowledge work and collaboration
Software-defined platform

Value-added step 1 Supplier — Value-added step 2 Producer — Value-added step 3 Customer

Data, information — "Knowledge", value creation in the digital world

Source: Siemens 2014

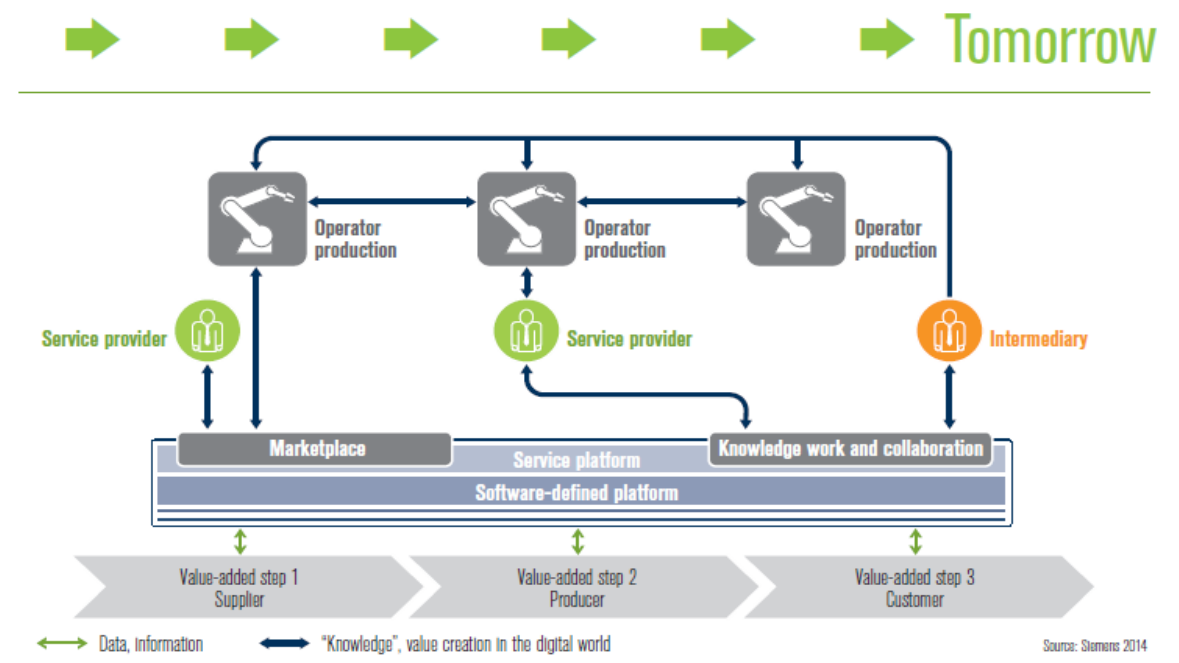# SMART SERVICE WELT

Recommendations for the Strategic Initiative
Web-based Services for Businesses

FINAL REPORT

CODE_n Conference: Industry 4.0 – Tapping the full potential of future manufacturing

CODE_n
Accenture & Smart Service Welt

Products remain linked to their **manufacturer**
...generating tons of data ...
... enabling new digital services ...

0:43 / 1:26:22

Brussels, June 2017

Community-led sector-specific (vertical)

RAMI

FITMAN

FIWARE For Industry

FI-WARE FITMAN

Community-led cross-sector (horizontal)

S3P SMART, SAFE & SECURE PLATFORM

IDS

MI DIH Digital Innovation Hub

BE in CPPS
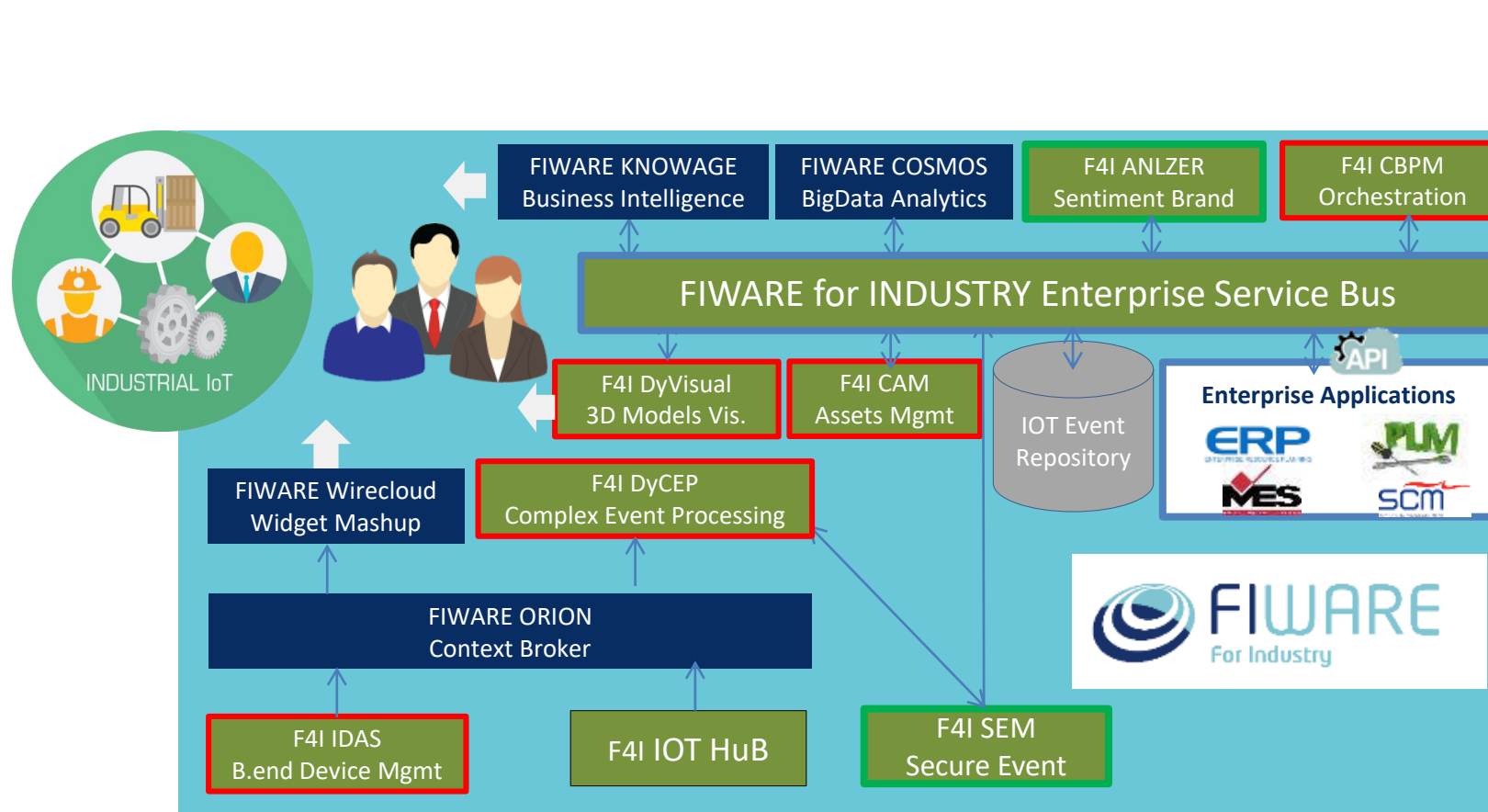
AIOTI

CRYSTAL

Industrial Internet CONSORTIUM

ARROWHEAD

FAR EDGE

eit Digital

OEDIPUS

etary pen interfaces

SIEMENS

DASSAULT SYSTEMES

SAP HANA for Supply Chain and Manufacturing

GE Predix

AGENDA

17.30 - 17.45 The FIWARE for Industry Platform
(Sergio Gusmeroli, Politecnico di Milano – Engineering)

17.45 - 17.55 The IoT Solutions Space: Real-Digital World Data Interoperability: the **PSYMBIOSYS** Platform
(Uri Shani, IBM)

17.55 - 18.05 The IoT Solutions Space: Edge-computing IoT architecture, the **FAR EDGE** Project
(John Soldatos, AIT)

18.05 - 18.15 The Industrial Space: implementing Whirlpool **Industry 4.0** Strategy
(Pierluigi Petrali, Whirlpool EMEA)

18.15 - 18.25 The Industrial Space: the **BEinCPPS** Experiment in Smart Moulds
(Juan Cadavid, CEA LIST)

18.25 - 19:00 Discussion:
        Digital Manufacturing Platforms: is the EU value proposition competitive?
        Industry 4.0 in Europe: how to involve Manufacturing SMEs in the fourth Industrial Revolution?

PSYMBIOSYS

IoT and the fourth Industrial Revolution

THANK YOU!!!!

Sergio Gusmeroli - Politecnico di Milano