



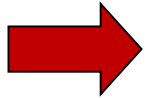
Digitising European Industry

Launch Smart Anything Everywhere Initiative

CEA Grenoble

Dr. Max Lemke

Head of Unit DG CONNECT – A3
European Commission



- Digital innovations: What is at stake?
- Where does Europe stand?
 - Digital industry and digitisation of industry
- What are we doing about it?
- Concluding remarks

Value creation from digitisation: Products, Processes and Business models

- "Digital inside": Innovations in all types of products
 - Smart connected objects (or IoT) powered by e.g.
 - Sensors, wearables, embedded software, Connectivity, Big data, Cloud ...
 - Large opportunities in all sectors (Non-tech, high-tech, SMEs, etc)
- Digital transformations of processes
 - From logistics and product design to shop floor automations and CRM
 - Increasing resource efficiency, productivity, ..
 - Built on IoT, digital design, robotics, laser technologies, big data,..
- Radical/disruptive changes in business models
 - Blurring the boundaries (products-services), reshuffling value chains
 - XaaS, 3D Printing & customisation, CRMs, maintenance, A Value services
 - Built on real time information, data analytics, etc..

The 'digital inside' value chain

New
digital
value
chains



R&D investments in ICT by non ICT sectors

	R&D spending B€	% on ICT
Aerospace and defence	150	37
Automotive	700	38
Electrical equipment	160	75
Healthcare equipment/services	65	55
Industrial manufacturing	240	55

Digital process innovation: e.g. manufacturing

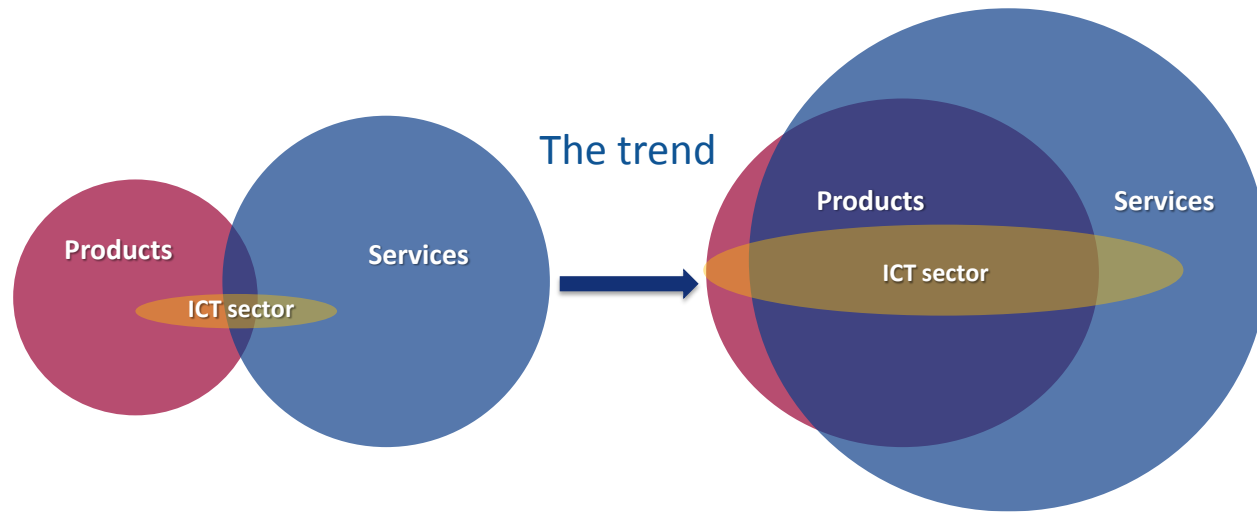
Modelling, Simulation, Analytics and big data

Cyber-physical systems for
process (chain) optimisation



Transforming the business model

Blurring boundaries: products-services



Trends in business models

- "Reintegration" across the value chain
- Expansion to services
- Expansion to "systems of systems"
- "Sharing" economy
- Des-intermediation

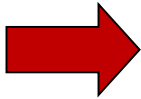
Game-changing technologies

- simulation and data analytics
- sensing and control
- digital automation
- 3D manufacturing
- Seamless connectivity and Cloud)

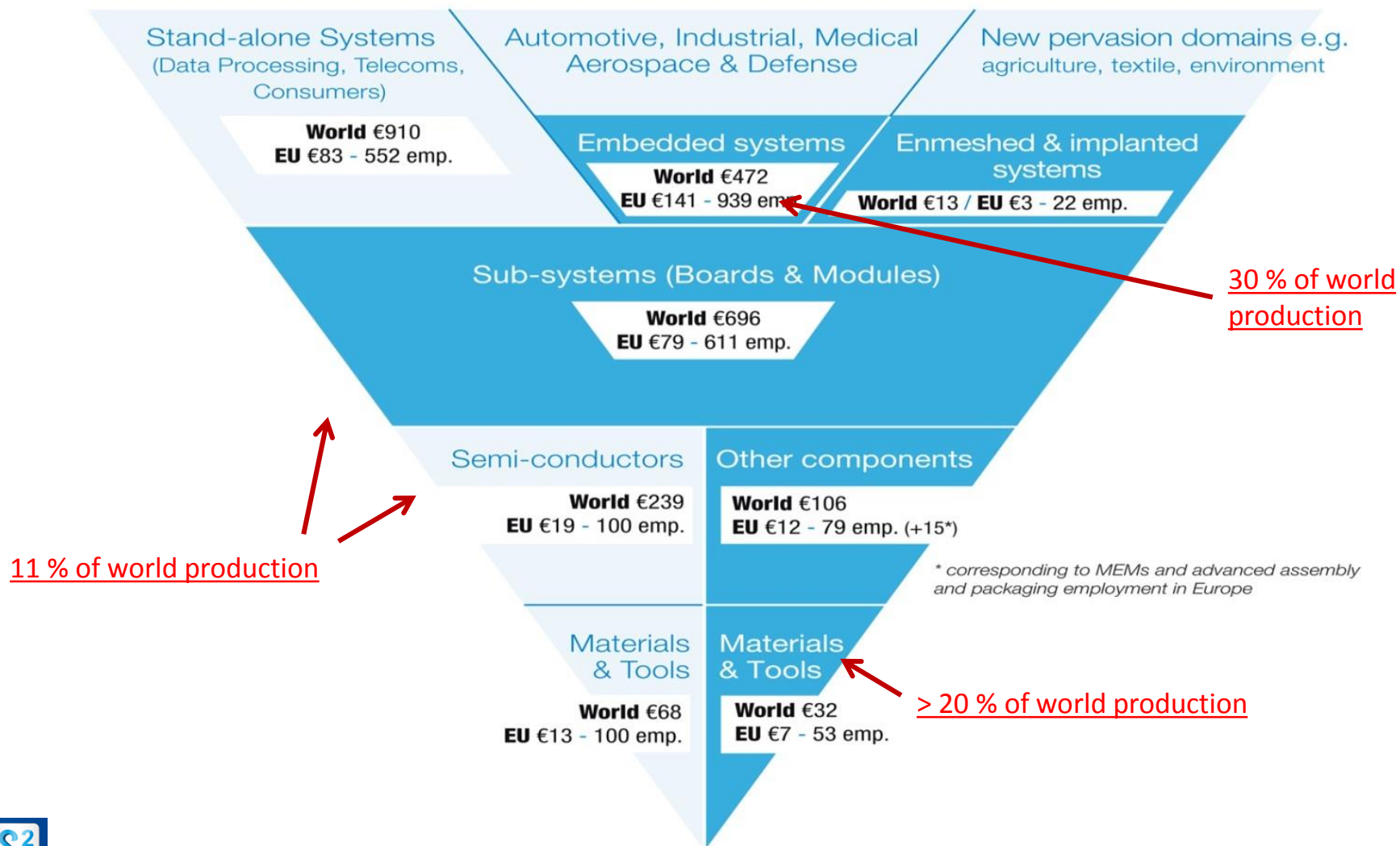
Technology tracks and Opportunities ahead

- Five main converging innovation tracks
 - Big Data
 - Cloud
 - CPS, Smart connected objects and IOT
 - Robotics, Autonomous systems and automation
 - Hyper connectivity, BB and wireless
- Areas of business opportunities
 - High growth "Smart X" and IoT markets
 - Mobility, society (smart homes, smart cities, wearables,..), manufacturing, health, energy, etc..
 - High growth of vertical markets!!
 - Automotive, energy, security, etc.
 - Next digital champions may come from "non-digital" industries
 - And vice versa!!

- Digital innovations: What is at stake?
- Where does Europe stand?
 - Digital industry and digitisation of industry
- What are we doing about it?
- Concluding remarks



EU strengths: embedded software & systems



- Strengths
 - Professional and vertical markets (products and services)
 - Components, software, systems (robotics, engineering), networking,
 - World class R&D hubs
 - Good infrastructure
 - Size of EU market (~27% of world ICT market)
- Weaknesses
 - Consumer markets, Internet and web products and services
 - From components to applications, Data platforms' ownership
 - Structural weaknesses
 - No DSM yet (substantial impact on attractiveness to investment including VCs, BAs, etc..)
 - Lagging in investment in R&D
 - Already paying the price

Digitised industry: What is the situation?

- Strong digitisation in high tech industries and in some MSs.
- But:
 - Slowness and disparities in adopting digital solutions across industries and regions
 - Mainly SMEs and non tech sectors lagging behind
 - New competition from non-EU digital platform owners
 - E.g. OS, Web and Data platform owners
 - Lack of standards and interoperable solutions
 - Skills and re-skilling of work force
 - Legislative and regulatory gaps
 - Fragmentation of effort in Europe

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
- Innovate UK
- Action Plan for Manufacturing (Scotland)

Belgium

- Made Different
- Flanders Make/iMinds (Flanders)

France

- Usine du Futur
- FoF Ile-de-France

Portugal

Produtech

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

European Commission
DG CONNECT, Unit A3, ML

Sweden

Produktion 2030

Netherlands

Smart Industry

Finland

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

Poland

- INNOMOTO
- INNOLOT
- Digital manufacturing for the SME (Mazovia)

Germany

- Industrie 4,0
- Smart Service World
- Autonomik fur Industrie 4.0
- It's OWL (Ostwestfalen-Lippe)
- Allianz Industrie 4.0 (Baden-Württemberg)

Austria

Produktion der Zukunft

Italy

- Fabbrica Intelligente
- Ass. Fabr. Intell. Lombardia

Spain

Estrategia Fabricacion Avanzada (Basque region)

Greece

Operational Programme in Region Western Greece

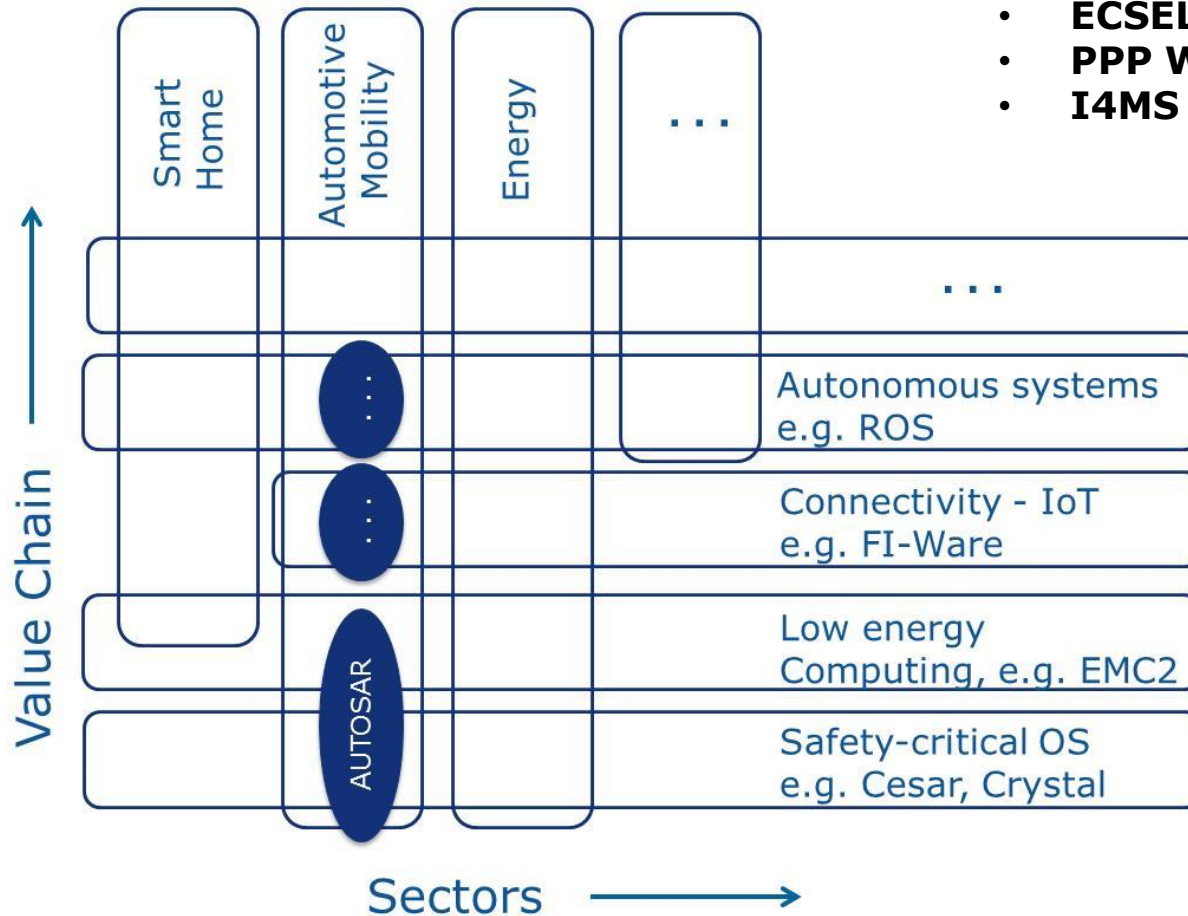
- Digital innovations: What is at stake?
- Where does Europe stand?
 - Digital industry and digitisation of industry
- ➔ • What are we doing about it?
- Our financial investments in embedded software and systems in H2020
- Concluding remarks

- Combine policies to achieve clear goals
 - Financial support, regulatory issues, Skills
 - E.g. maintain 30% of world production of CPS
- Build on strengths and seize opportunities
 - Maintain leadership in stronghold as they move mainstream
 - A strong digital industry and strong digitised industry
- Work in partnerships
 - Leverage investment, focus and strategy
- Address the whole value chain and innovation chain
 - Supply-demand interaction, multiple stakeholders, SMEs
- Connect to national and regional actions
 - Combine resources to reach critical mass, align strategies
 - Links to hubs of excellence and regional clusters

1. Access: Wide-spread adoption and best use of digital technologies
 - In **all** industrial sectors
 - Focus on key digital technologies ("The musts")
2. Leadership **in digital platforms** for industry
 - Platforms on which value is created
 1. E.g. embedded OSs, Autonomous systems building blocks, Cloud platforms, data, security
 2. Openness, Interoperability, security
3. Filling the skills gap and preparing the workforce for change
 - Essential!
4. Providing the best framework conditions
 - Regulation: DSM, Data protection, Liability, safety
 - Access to finance: EIB, EIF, etc..

- **Different types of platforms**
 - Organisational, technology, operational
 - Open vs. proprietary
 - Sector-specific (vertical) vs. cross-cutting (horizontal)
 - Value creation: "with" the platform and/or "on" the platform
 - Scale: from "niche" platform to broad consumer platforms
- **Platforms on which value is created – on and across levels:**
 - Well-being, home, cars (user perspective)
 - Analytics, design & simulation
 - Cloud and web applications (free from vendor-lock-in)
 - Middleware: embedded OSs, IoT, autonomous systems building blocks, Systems of Systems, security frameworks, ...
- **Scale-up our efforts by pan-European collaboration**
 - ICT PPPs: ICT Platforms + large scale demonstrators (IoT, ECSEL, ...) (examples: AUTOSAR, FI-Ware, ...)
 - Platforms for the manufacturing sector – from cradle to grave
 - Platform interoperability & standards in Digital Single Market package
 - Platforms supported and adopted across MSs and regions (e.g. Virtual Fort Knox, Digital Factory Operating System, ...)

Leadership in digital platforms for industry



Appropriate Instruments:

- **ECSEL Pilot Projects**
- **PPP Work Programmes – FoF, ...**
- **I4MS and alike**

New Innovation Schemes for wide-spread adoption of digital technologies

I4MS

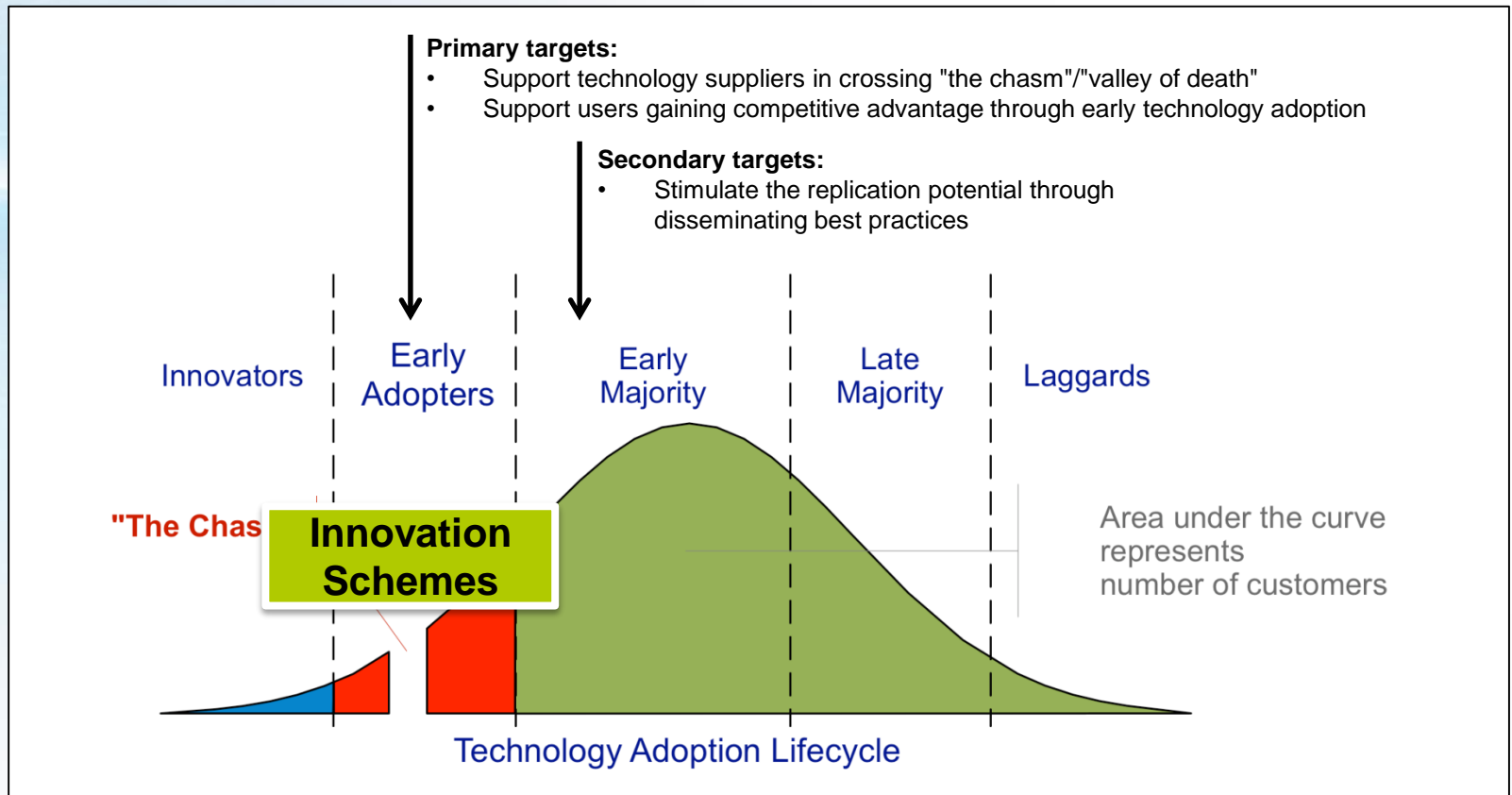
**Digital
Manufacturing**

**Smart Anything
Everywhere**

**ICT inside of
products and
services**

New Innovation Schemes - Motivation

Connecting innovators across value chains to support adoption of emerging ICT in novel applications



New Innovation Schemes - Characteristics

❑ Built around pan-EU networks of competence centres (normally RTOs or universities)

- Provide expertise and skills
- Broker/facilitator across
 - Value chains
 - Regions
 - Industrial sectors
- Technology Transfer

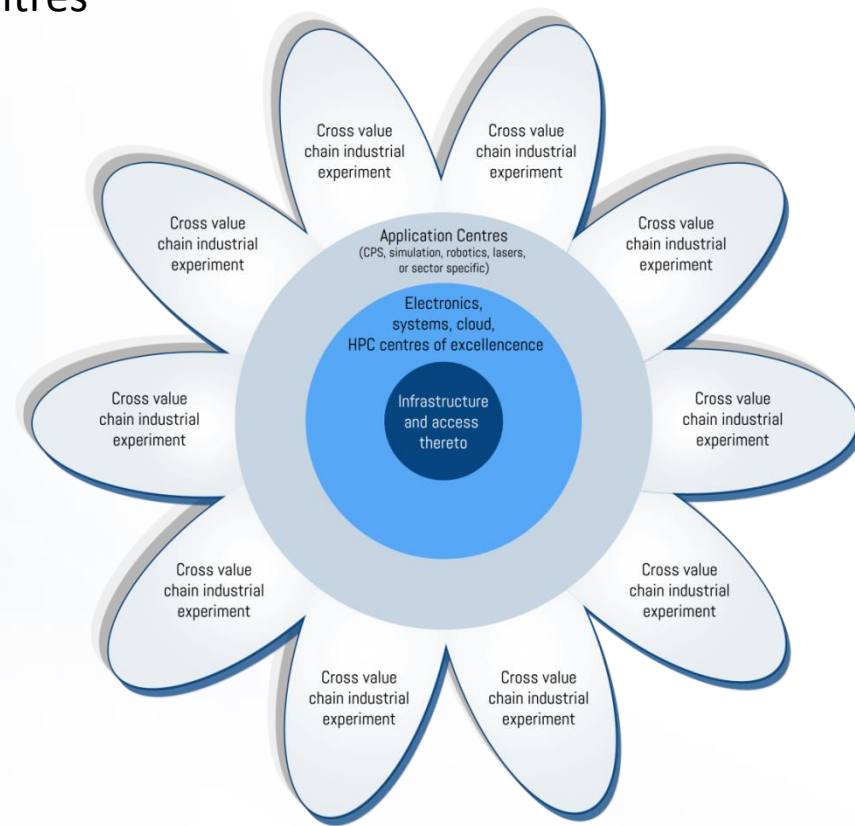
❑ Dissemination / Multiplier

❑ Critical mass of experiments

- Industrial – focus: SMEs/mid-caps
- Cross value chain
- Flexible partnerships (50-250M€)
- Share lessons learnt – not IPRs

❑ Flexible and light implementation

- Open Calls for new experiments
- Cascading funds to third parties



**Typical project structure
(IP/large IA)**

Wide spread adoption of digital technologies



under the PPP
Factories of the Future



Smart Anything
Everywhere under
Components & Systems

Status:

- 102 M€ – 11 projects – 70 centres – 300 experiments
- New wave through 2015 calls ~53M€

❑ Collaboration across value chains: competence centres and experiments

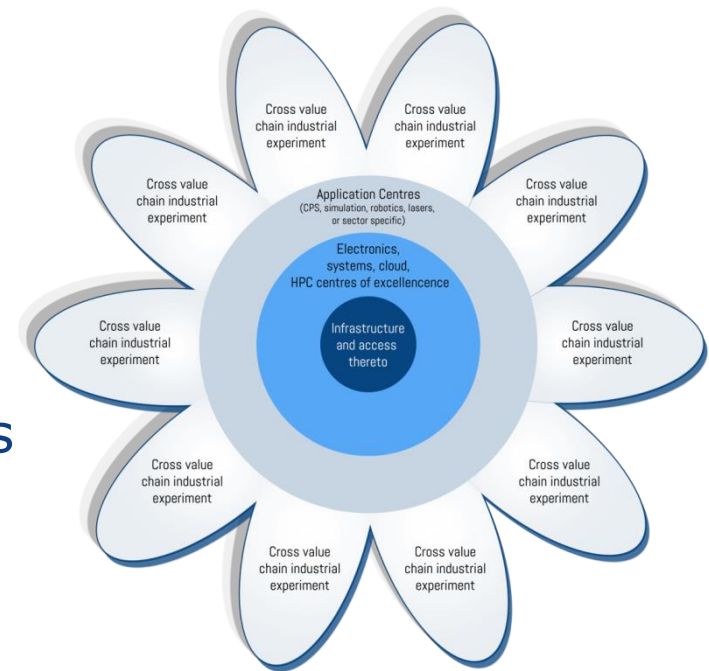
- Microelectronics & Smart systems
- Cyber-physical systems / IoT
- Applications and industrial sectors

❑ Access to "infrastructures" and services

- Microelectronics pilot lines
- Smart system and Cyber-physical systems development tools

❑ Call for second batch closing mid April, start Jan 2016

- Embedded computing, micro/nano electronics



Smart Anything Everywhere Initiative

launched in February 2015

4 projects: 25 M€ / ~100 Experiments

Target involvement of SMEs/mid caps: +-200

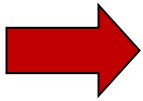
EuroCPS [8.2M€]: A network of design centres boosting and initiating synergies between SMEs, major CPS-platforms and competency providers to capture the emerging markets of IoT products. **30 experiments** initiated and led by SMEs.

CPSELabs [7.5M€]: CPS engineering infrastructure, knowledge and tools for realising novel CPS-based products and services. The CPSELabs marketplace provides an open forum for sharing platforms, architectures and SW tools for the engineering of dependable and trustworthy CPS. **20 Focussed experiments** (3-6 partners) and fast-track (12-18 months) with innovation objective.

GateOne [5.4M€]: Innovation service for European smartization by SMEs. 20% of bioelectronics technologies. **50 small scale experiments** to deliver innovation concept as demonstrators with SMEs engaged in testing phase.

Smarter-SI [4.5M€]: Smart access to manufacturing for systems integration. To develop a RTO Community Foundry Model (CFM) that will accelerate a wider deployment of SSI with greater access to design, manufacturing capabilities for prototyping, early validation and first production for SMEs to exploit in niche markets (low volume high value). A test bed to realise **10 application experiments**

- Digital innovations: What is at stake?
- Where does Europe stand?
 - Digital industry and digitisation of industry
- What are we doing about it?
- Concluding remarks



- High political momentum for digitising European industry
- Four key issues need to be addressed:
 - 1) Wide-spread adoption & best use of digital technologies in **all** industrial sectors – **SAE is a key element of this**
 - 2) Increase emphasis on pan-European platform building
 - 3) Filling the skills gap and preparing the workforce for change
 - 4) Provide the best framework conditions
- Success depends on a strong collaborative effort
 - Between EU DGs and programmes, national and regional initiatives
 - Across all actors and value chains: industry, RTOs, social actors, ...
- Next steps in European Innovation Initiatives like SAE and I4MS
 - Focus on providing the glue between initiatives across the EU
 - Pool resources to organically grow the ecosystem
 - R&D&I instrument toolbox (Horizon 2020)
 - European Structural and Investment Funds (ESIF)
 - New investment (Junker) package

THANK YOU

Digital Agenda for Europe – Components and Systems:

<https://ec.europa.eu/digital-agenda/en/science-and-technology/components-systems>

DG CONNECT (Communications Networks, Content and Technology):

http://ec.europa.eu/dgs/connect/index_en.htm

Horizon 2020 on the web: http://ec.europa.eu/research/horizon2020/index_en.cfm

ICT Innovation for Manufacturing SMEs: i4ms.eu

Structural Funds 2014-2020 and Smart Specialisation:

http://ec.europa.eu/regional_policy/index_en.cfm