

*Productive*4.0

A Digitalisation Approach for the European Industry

at HiPEAC 2017 Stockholm
EMC2 Workshop
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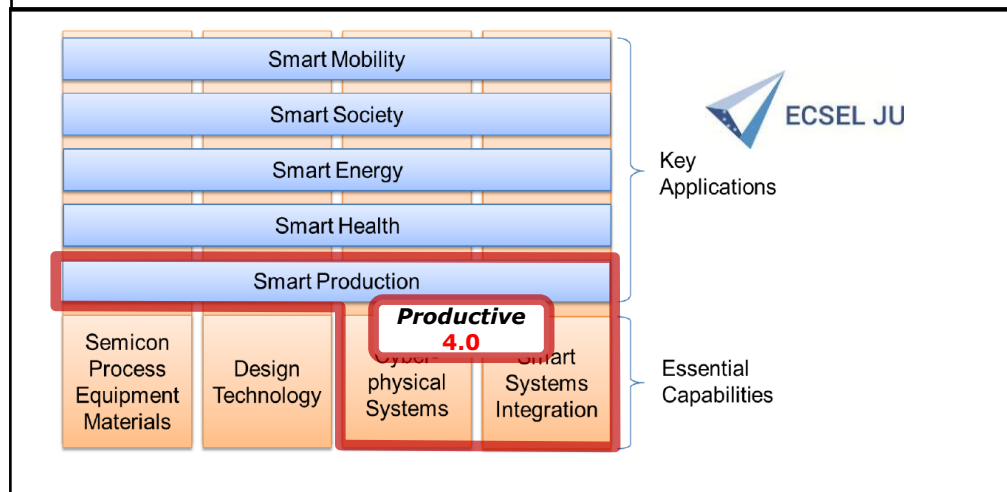
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EC Horizon2020



ECSEL Electronic Components and Systems
for European Leadership



ECSEL Innovation Action & Lighthouse

Productive4.0 Electronics and ICT as enabler for digital industry and optimized supply chain management covering the entire product lifecycle

EMC²

ARROWHEAD

SEMI40

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ECSEL Innovation Action & Lighthouse

Productive4.0 Electronics and ICT as enabler for digital industry and optimized supply chain management covering the entire product lifecycle

ECSEL Innovation Action Project TRL5-8

IoT-enabling HW/SW: sensors, actuators, communication, security, embedded computing

Analysing methods and modeling of Big data

Secure realtime data processing

Manufacturing automation

Supply chain management, Big data handling

Fab/Supply chain virtualisation and simulation

Production planning & control, Logistics, Maintenance

Production use-cases

Scope of *Productive4.0*

Research

Product
Development

Manufacturing

Product In-
use

Recycling

Main objective



Significant improvement in digitalising the European industry by means of electronics and ICT.

- aiming at suitability for everyday application
- various industrial domains with same approach of digitalisation.

- 112 Partners
- 19 countries
- 65% Industry
- Budget: 115 Mio €
- JU funding: 25 Mio €



- Well balanced across ECSEL communities:
 - 45% AENEAS
 - 30% ARTEMIS-IA
 - 25% EPOSS

Productive4.0: *ca. 65% HW electronics; 35% system architecture, methods and tools*

- Key partners:

BMW, Philips, Infineon, ABB, SAP, NXP, STM, BOSCH, Thales, AVL, VOLVO, CEA, BetterSolutions, IMA, KIT, AIT, FhG, Sysgo, DANOBAT, MONDRAGON, ERICSSON, COMBIENT, VTT, SINTEF, LTU, LFOUNDRY ,TNO, TTTech, Siltronic, VIF and many more..

- Key industrial domains:

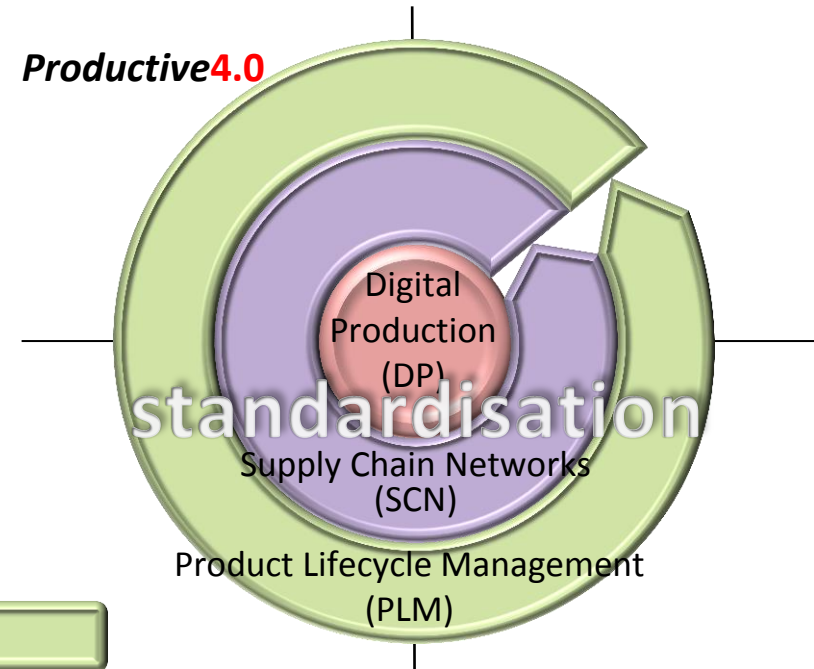
Automotive,
Machinery,
Semiconductor & Electronics,
Consumer,
Automation,
Logistics

Productive4.0 will take a major step towards a hands-on approach of digitalising the European industry with the focus on the three pillars:

Digital production (DP)

Supply Chain Networks (SCN)

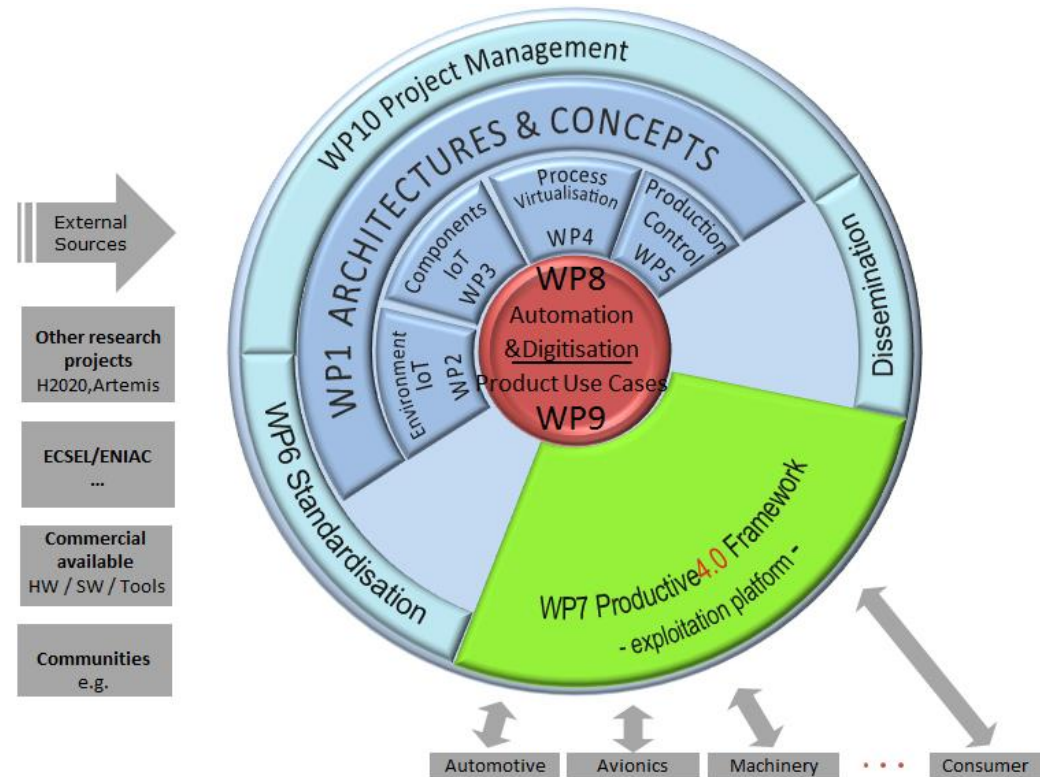
Product Life Cycle Management (PLM)

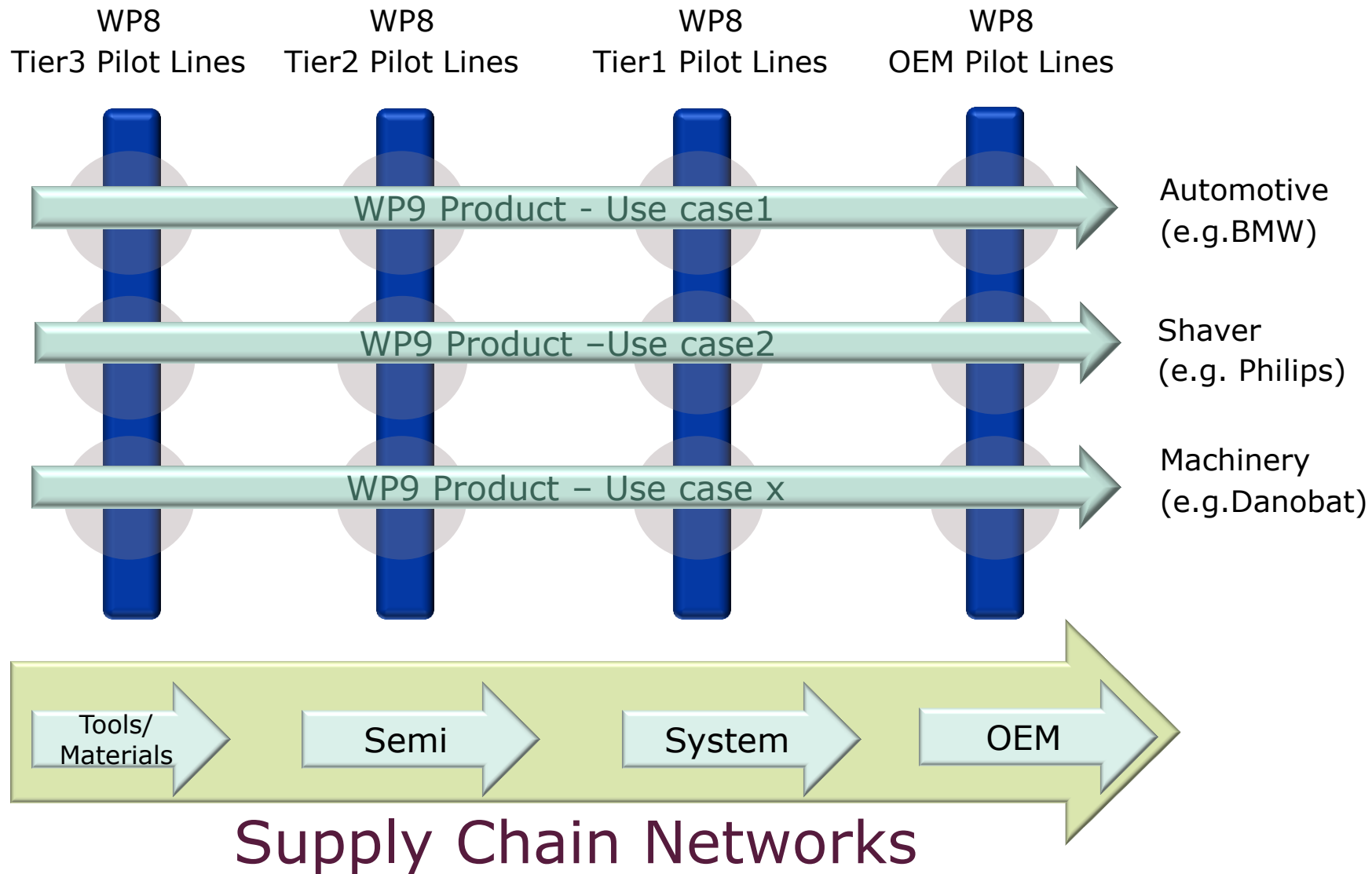


Project Structure – towards reference implementations

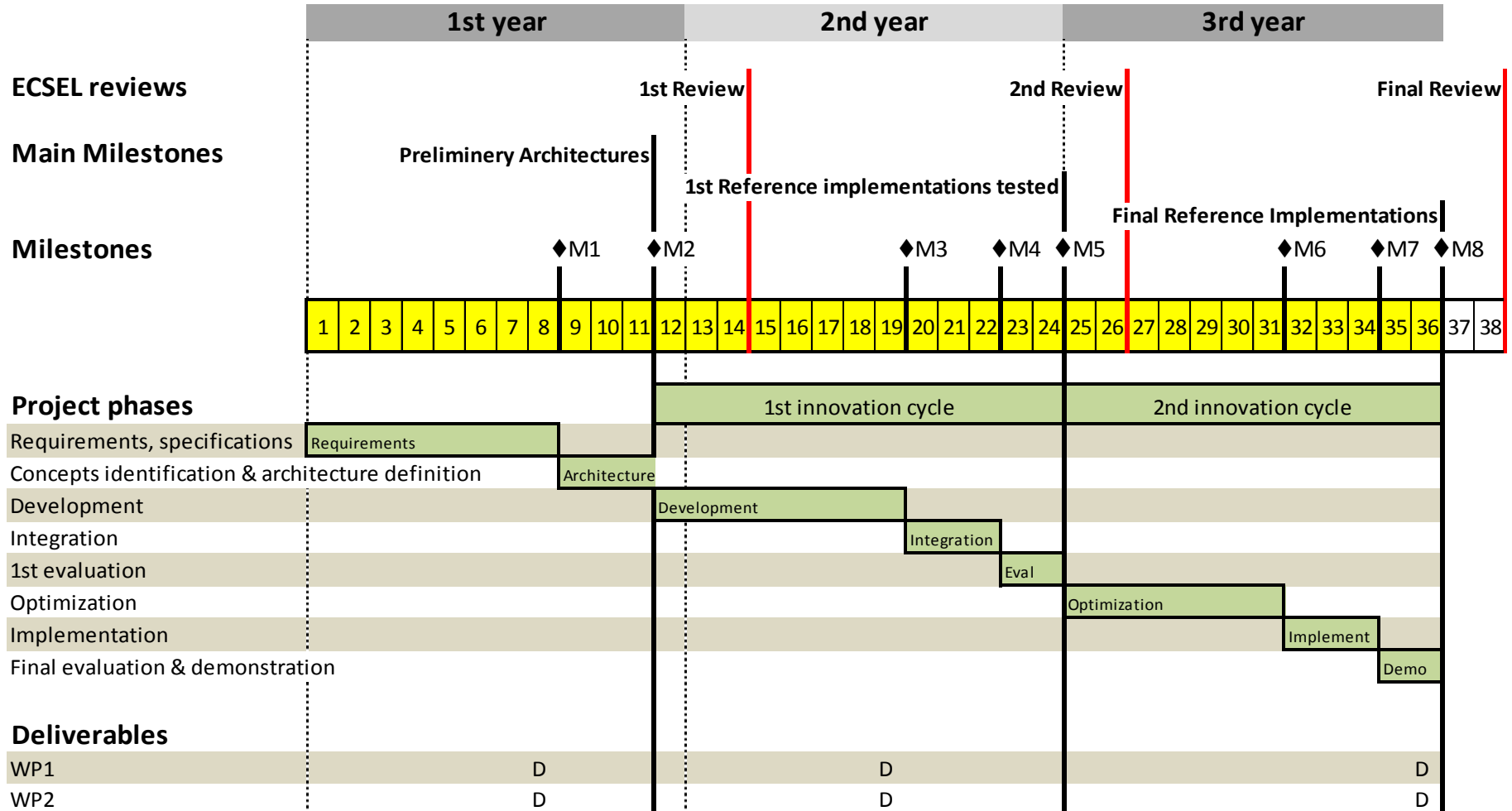
The relevant objectives per work package are:

- 1) Furnish the Digital Industry with SoS-based architecture platforms
- 2) Set up a data analytics framework and a secure communication environment
- 3) Provide the industry with IoT-enabling components
- 4) Develop complex simulation models for DP, SCN and PLM
- 5) Create powerful systems for planning, virtualising and controlling
- 6) Foster relevant standards in the industry
- 7) Establish the **Productive4.0** framework as a cross domain platform for the Digital Industry
- 8) Provide for practical solutions and reference implementations for the Digital Industry
- 9) Implementation of reference product use cases for the different industrial domains
- 10) Establish an appropriate environment for the **Productive4.0** brain pool partners





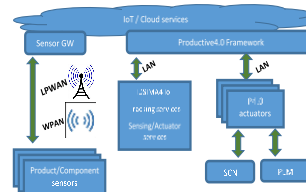
Project phases



.. the hands-on approach - **Reference implementations for the Digital Industry** across various industrial domains and applications..

examples **OEM use cases**:

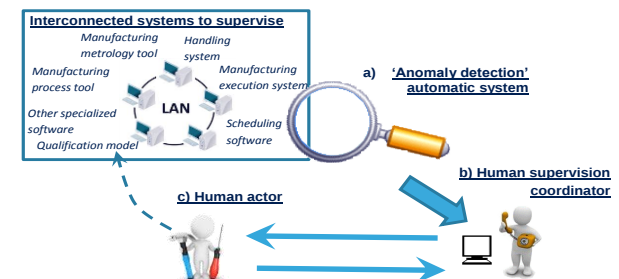
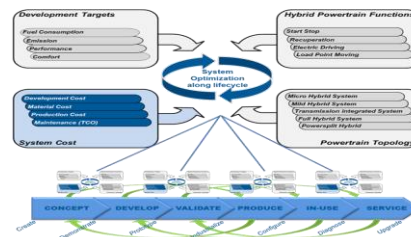
- **Lot size 1**: Vehicle individualization in a highly automated assembling process in the Automotive Industry in the logistics based on Product Lifecycle Management Systems (BMW, EDMS)
- **Flying robots** (BMW, IEMTEC, BAUMUELLER, KINEXON, FAU FAPS)
- **Industrial IoT/CPS system** (VTC, COMBIENT, ERICSSON, LTU, EISTEC, SEB)



.. the hands-on approach - *Reference implementations for the Digital Industry* across various industrial domains and applications..

examples **Tier1 use cases**:

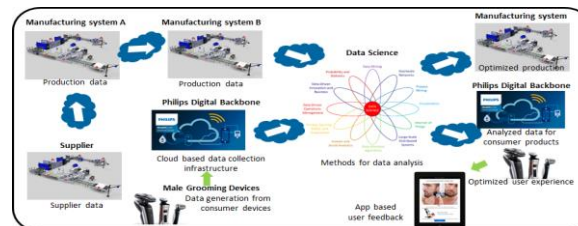
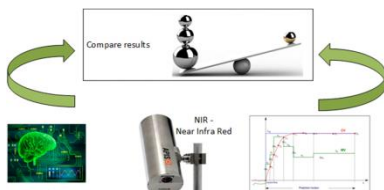
- Smart services for test equipment (AVL)
- Simultaneous Cost Engineering for powertrain architectures (AVL)
- Smart Services for Trusted Manufacturing Site (ABB)
- Supply chain management for semiconductor manufacturing (BOSCH)
- Smart failure analysis lab (IFAT)



.. the hands-on approach - *Reference implementations for the Digital Industry* across various industrial domains and applications..

examples **Tier2 use cases:**

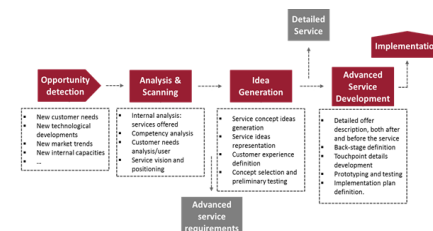
- High Automation Solution in SC Wafer production line (Siltronic, SYSTEMA)
- Data Analytics, Semiconductor Data Lake (Infineon, SYSTEMA)
- Fab robotization (ST ROUSSET)
- Adaptive mobile robotic systems for smart manufacturing (FH Stralsund, Infineon)
- Flexible Autonomous Robots with Advanced Handling Functionality (RRO, IFD)
- Single device tracking and advanced process control in assembly and packaging for system integration (Infineon)



.. the hands-on approach - *Reference implementations for the Digital Industry* across various industrial domains and applications..

examples *Product/Application use cases:*

- Shaver system use case (Philips)
- Extended Product Lifecycle Management (THALES)
- Machinery for railway wheels (DANOBAT, MONDRAGON)
- Chemical production (Unger, Prediktor, HIOF, TellU, SINTEF)
- Machine and fleet management offered as industrial services (VTT, TUT, WAPICE)
- Virtual production planning and control of a semiconductor supply chain (BOSCH, UoC, KIT)



Thank you for your attention!



ECSEL Joint Undertaking

Electronic Components and Systems for European Leadership

