



# EF ECS 2020

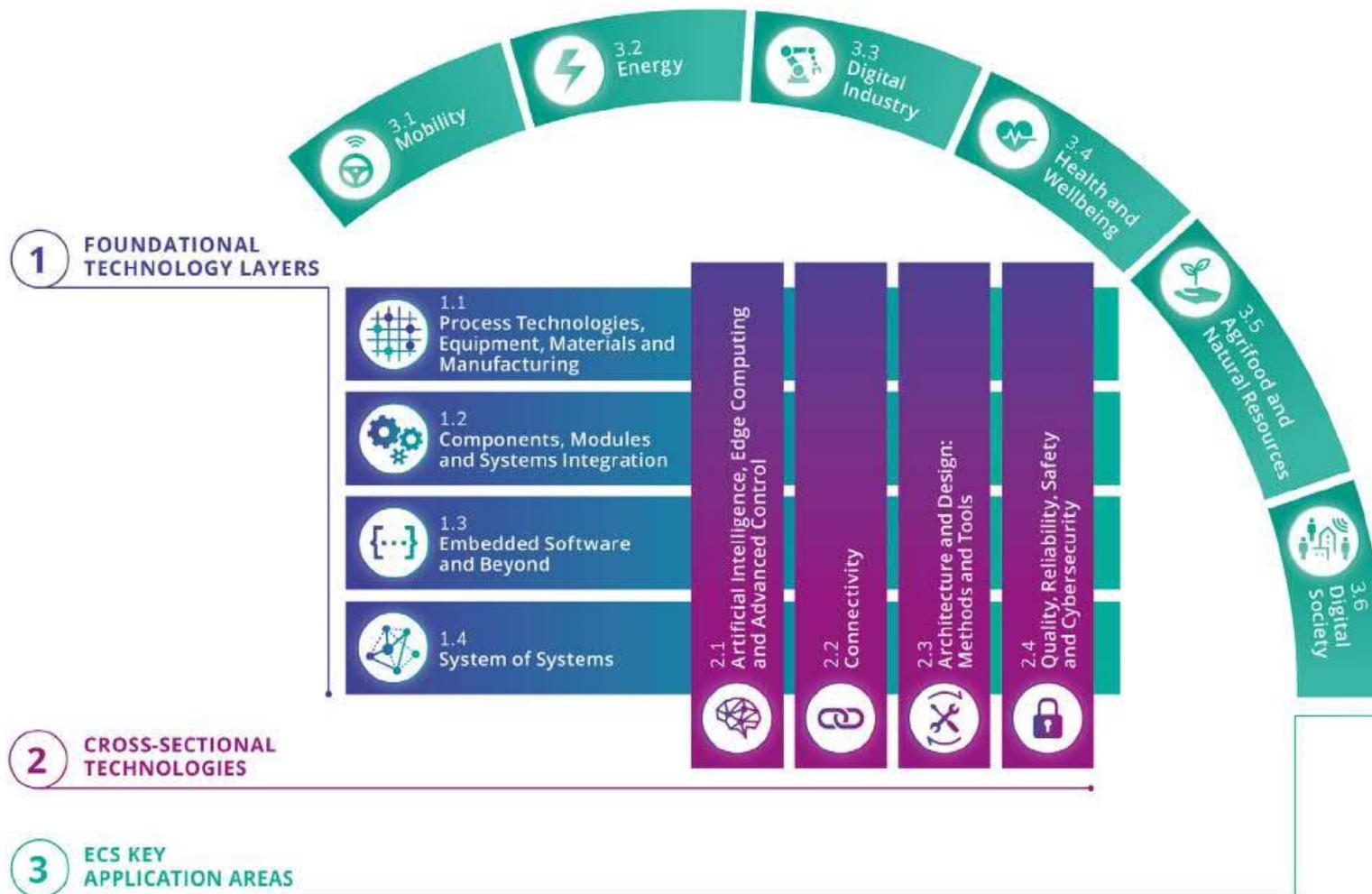
Session: Research Priorities for Digitization of Industries  
Date: 26<sup>th</sup> November 2020

Presentation:  
ECS SRIA 2021 – Digital Industry, Olli Ventä, VTT



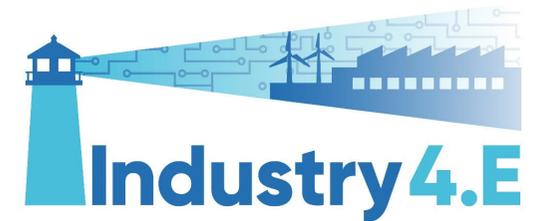
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# The new structure of the ECS-SRIA



# Contributors

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INITIATIVE FOR EXCELLENCE IN DIGITAL INDUSTRY

# Contents of chapter

1. Scope
2. Application trends and societal benefits
  1. External requirements
  2. Societal benefits
3. Strategic advantage for EU
4. Major challenges
  1. Responsive and smart production
  2. Sustainable production
  3. Artificial Intelligence in Digital Industry
  4. Industrial service business, life-cycles, remote operations, and teleoperation
  5. Digital twins, mixed or augmented reality, telepresence
  6. Autonomous systems, robotics
5. Synergy with other themes
  1. About engineering tools
  2. About Trust, security, Cybersecurity, safety, privacy
  3. About digital platforms, application development frameworks



# Scope

## DIGITALISATION OF

- Discrete manufacturing
- Process industry
  - Energy (own chapter)
- Machines, robots
  - Farming machines, etc. (own chapter)
- Supply chains, value chains and lifecycles
- Functions across business levels



# Major challenge 1: Responsive and smart production



## Key focus areas

- Robust optimal production, scalable first-time-right production
- Mass customization and personalized manufacturing, customer-driven manufacturing, mastering the complexity of products, processes and systems
- Resilient and adaptive production, including the shortening of supply chains and modular factories
- Cognitive production
- Manufacturing as a service
- Standardisation

# Major challenge 2: Sustainable production

## Key focus areas

- Lifecycle assessment: LCA
- Monitoring flows of energy, materials and waste
- Human-centred manufacturing, Extended human capabilities enabled by big data and AI
- Human safety, competence and quality of work
- Human–machine interfaces and machine-to-machine communications
- Green Deal



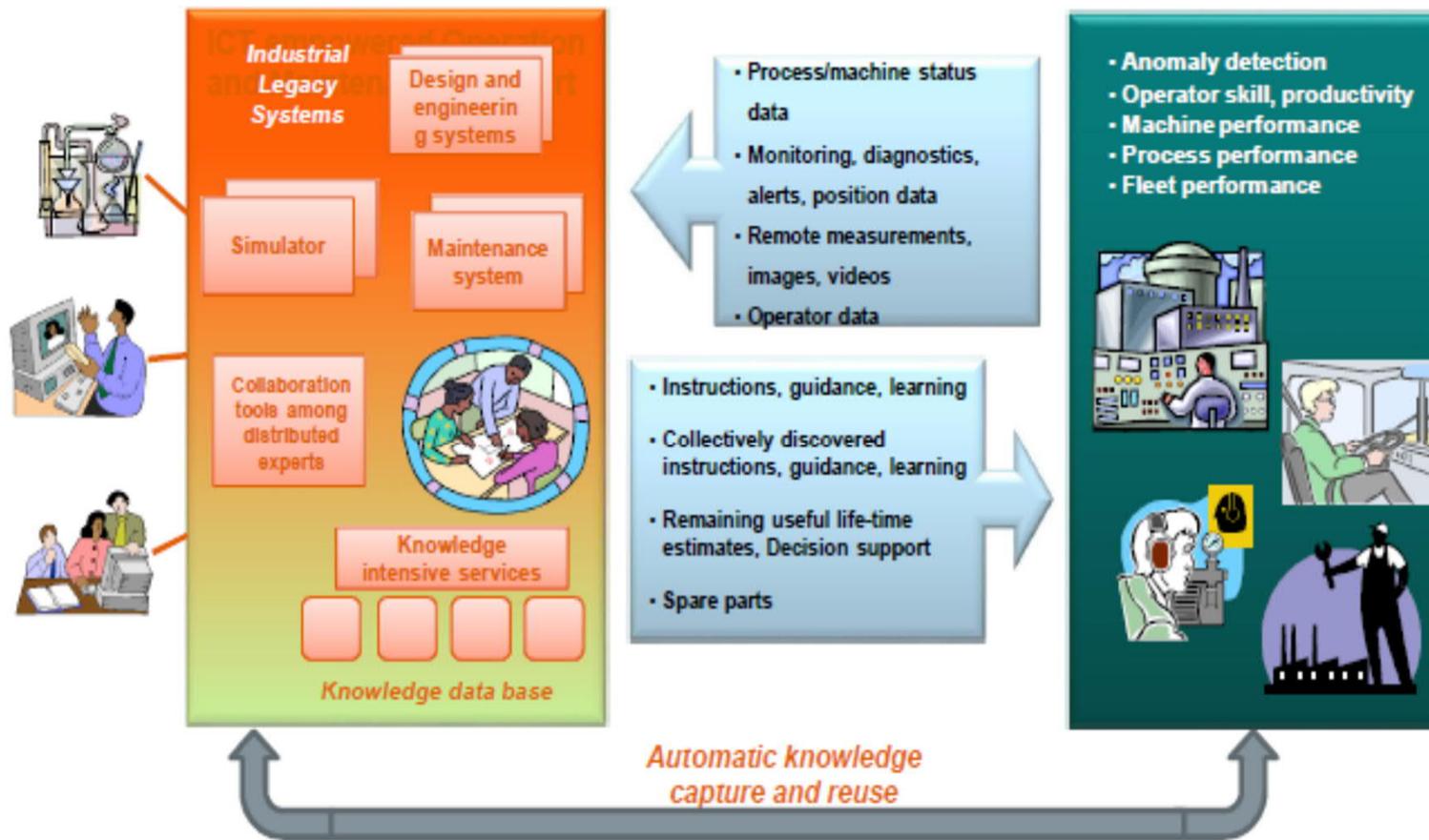
# Major challenge 3: Artificial Intelligence in digital industry

## Key focus areas

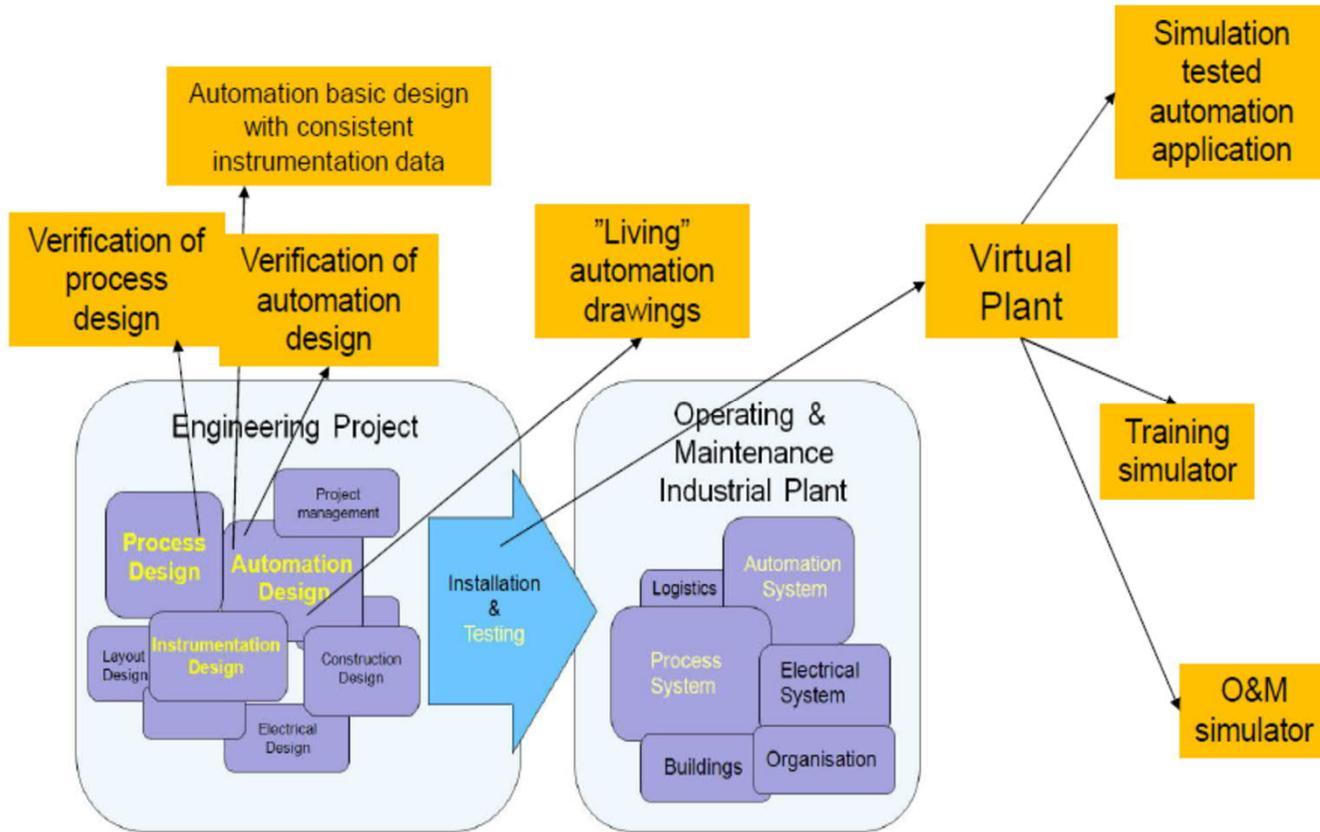
- European AI framework
- AI in manufacturing
- AI for decision-making
- AI for monitoring and control



# Major challenge 4: Industrial service business, lifecycles, remote operations and teleoperation



# Major challenge 5: Digital twins, mixed or augmented reality, telepresence



# Major challenge 6: Autonomous systems, robotics



## Key focus areas

- Autonomous functions of systems
- Safety and security in autonomous systems
- Requirements management and conceptual modelling of autonomous systems
- Human machine interaction in autonomous systems
- Verification and validation, digital verification and validation (V&V)
- Digital design practices
- Simulators and autonomous systems
- Autonomous capabilities development in a digital environment

# Synergy with other themes



Topics dealt with in other chapters of the SRIA but are very important for Digital Industry, as well. They could have been listed as Major Challenges here, too.

Examples:

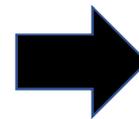
- About engineering tools
- About trust, security, cybersecurity, safety, privacy
- About digital platforms, application development frameworks
- ... or other combinations of foundational and cross-sectional technologies in this SRIA, serving digitalization of industry



# Thank you!

Comments to:

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# Discussion (Q&As)

Title: Industry4.E Workshop - Research Priorities for Digitisation of Industries

Time: 11.30 to 13.00

Date: 26<sup>th</sup> November 2020



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# Collaboration & Innovation Opportunities 2021-2022



## Be roadmap ready:

- Recommendations on the future of the [Industrial Digitalisation Roadmap](#) & the Digital Industry chapter of the [Strategic Research Innovation Agenda](#) for Electronic Components & Systems 2021

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