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Added value and impact

Technologies and
enablers

Digitalisation pathways

Standards,
standardisation and
regulationICT performance
characteristics

Business model aspects

 Projects

Welcome to the EFFRA Innovation Portal

Here you will find information about manufacturing research & innovation projects, results and demonstrators.

If you would like to feature your project in the Portal or have a question about updating project information, please [contact us](#).

This portal also supports the brokerage activities with respect to the future calls for proposals (see www.effra.eu/calls-proposals).

You can find more information about the FoF PPP and EFFRA on www.effra.eu.

You can read the EFFRA privacy policy [here](#).

If you have questions about the EFFRA Innovation Portal, then please contact Patrick Kennedy at [EFFRA](#).

DIGITAL MAPPING FRAMEWORK

Skills and engineering tools

Skills for operation of the technologies

Added value / optimisation focus

Business models / financial investment

Interoperability / standards

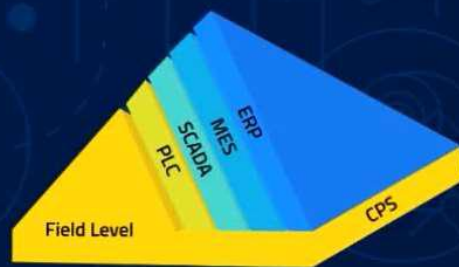
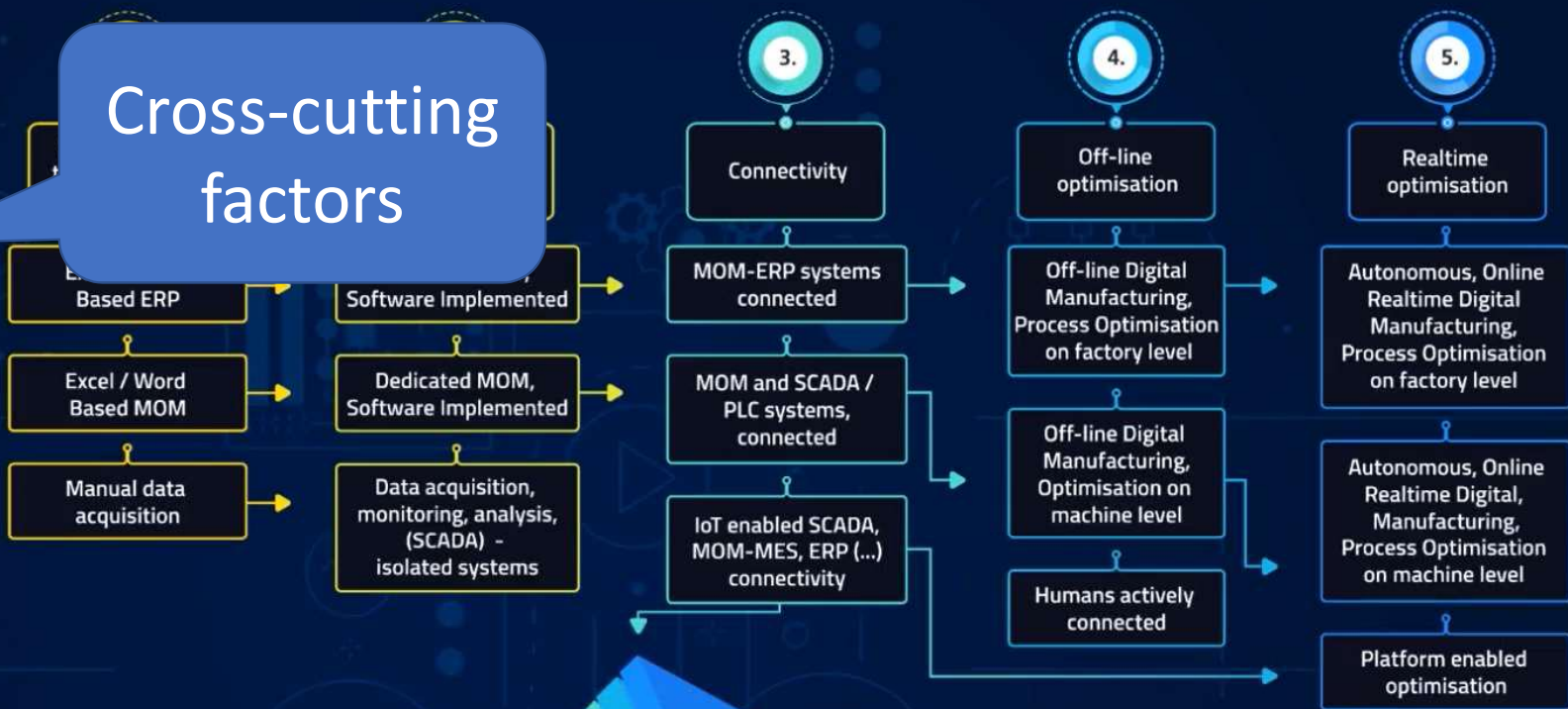
Security

Technology – building blocks

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PATHWAYS – MILESTONES

Cross-cutting factors



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 → pathways to digitalisation

Industrial state of play
in manufacturing

Cases that illustrate
advanced state of the art

Approaches & cases from
research & innovation projects



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Demonstrator / **BeinCPPS_SmartMold**

Rhône-Alpes Champion: The Smart Mold

Summary

The Smart Mold, Bringing Industry 4.0 to the plastic injection tooling sector

Description of the Experiment:

Pernoud designs high-tech steel molds for plastic injection. Pernoud is a company oriented towards groundbreaking innovation, with a huge potential to constantly create new means to improve the process of plastic injection for their clients. The objective for Pernoud is to add intelligence on plastic injection steel molds to transform this mechanical system in a CPS one, with an expectation of improving quality and reducing costs and delays of the part produced. To reach this goal we need a feedback from the mold to know what happened during the production. So to access to this information we need to instrument the mold with different embedded devices on it but also to directly have a look on that information any time it could be needed.

Main objectives of the Experiment:

- Data acquisition with sensors adapted for moulding tools. This will enable monitoring environment conditions using a smart system and sensors for temperature and pressure. The monitoring capabilities will produce alerts for the operator to allow them to react to possible malfunctions which could lead to quality problems in the produced pieces.
- Driving electrical actuators: The movement of the mold can be performed by electrical actuator. Those actuators will achieve flexibility levels not possible with standard hydraulic actuators. In fact, in multi-version molds, which are able to produce several versions of a product, the electrical actuators will



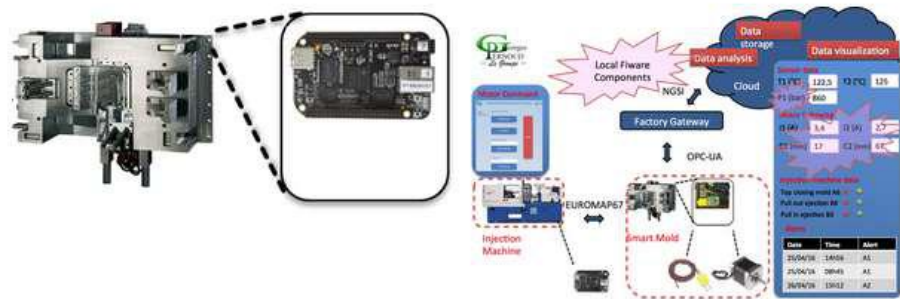
Associated projects



[BEinCPPS - Business Experiments
in Cyber Physical Production
Systems](#)

Associated products/services

[Papyrus: Industrial-grade open source Model-
Based Engineering tool](#)



Characteristics

Added value and impact - (4) ▲ close

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Economic sustainability

Product quality - Quality assurance

Comment: The smart mold helps to improve the follow up of the production (QA). The plant operator will be able to react more quickly to production deviations, therefore reducing strongly the scrap rates.

Social sustainability

Human aspects

Human-machine interaction

Comment: The smart mold provides HMI at several levels: -Production operators: real-time data and alerts, both at the work cell level, enterprise and cloud -Production managers and moldmakers: historical data analysis

Environmental sustainability

Reducing the consumption of energy, while increasing the usage of renewable energy

Technologies and enablers - (6) ▲ close

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Information and communication technologies

- Project ideas <
- People & organisations <
- Results & demos <
- Products/Services <
- Programmes <
- Portal administration <
- Super administration <
- Profile <

- Technologies and enablers [View Kanban](#)
 - Advanced manufacturing processes [View Kanban](#) [Description](#)
 - Mechatronics for advanced manufacturing systems [View Kanban](#)
 - Information and communication technologies [View Kanban](#)
 - Manufacturing strategies [View Kanban](#)
 - Skills - Knowledge-workers [Description](#)
- Digitalisation pathways [View Kanban](#)
 - Autonomous Smart Factories [View Kanban](#)
 - Collaborative Product-Service Factories [View Kanban](#)
 - Hyperconnected Factories [View Kanban](#)
 - Cyber-security [View Kanban](#)
- Standards, standardisation and regulation [View Kanban](#)
 - Standards [View Kanban](#)
 - Standardisation [View Kanban](#)
 - Compliance to Rules and regulations [Description](#)
- ICT performance characteristics [View Kanban](#)
 - Data communication and interoperability [View Kanban](#)
 - Cyber-security [View Kanban](#)
 - Real-time communication capability
 - Services
 - Safety
 - Privacy
 - Scalability
 - Data communication infrastructure
 - Resilience

- Information and communication technologies [View Kanban](#)
 - Digital manufacturing platforms - implementing secure, high performance and open services platforms [Description](#)
 - IoT - ICT solutions for factory floor and physical world inclusion [Description](#)
 - Human Machine Interfaces [View Kanban](#)
 - Data acquisition [Description](#)
 - Data storage [View Kanban](#) [Description](#)
 - Data processing [View Kanban](#) [Description](#)
 - Data modelling [Description](#)
 - Data analytics, including artificial intelligence (AI) [View Kanban](#)
 - Cognitive and artificial intelligence (AI) technologies [View Kanban](#) [Description](#)
 - Modelling, simulation and forecasting [View Kanban](#) [Description](#)
 - Programming Frameworks – Software Development Kits (SDKs) [View Kanban](#)
 - FIWARE [View Kanban](#) [Description](#)
 - Smart Industry Context Information Management and Persistence [View Kanban](#)
 - Smart Industry NGSI Agents Framework to Real World [View Kanban](#)
 - Smart Industry Information Processing [View Kanban](#)
 - Smart Industry Context Data/API Management, Publication and Monetization [View Kanban](#)
 - Programming Languages
 - Operating systems
 - Architecture [View Kanban](#)



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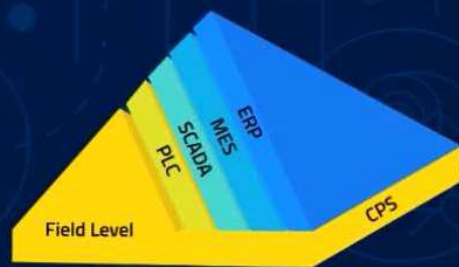
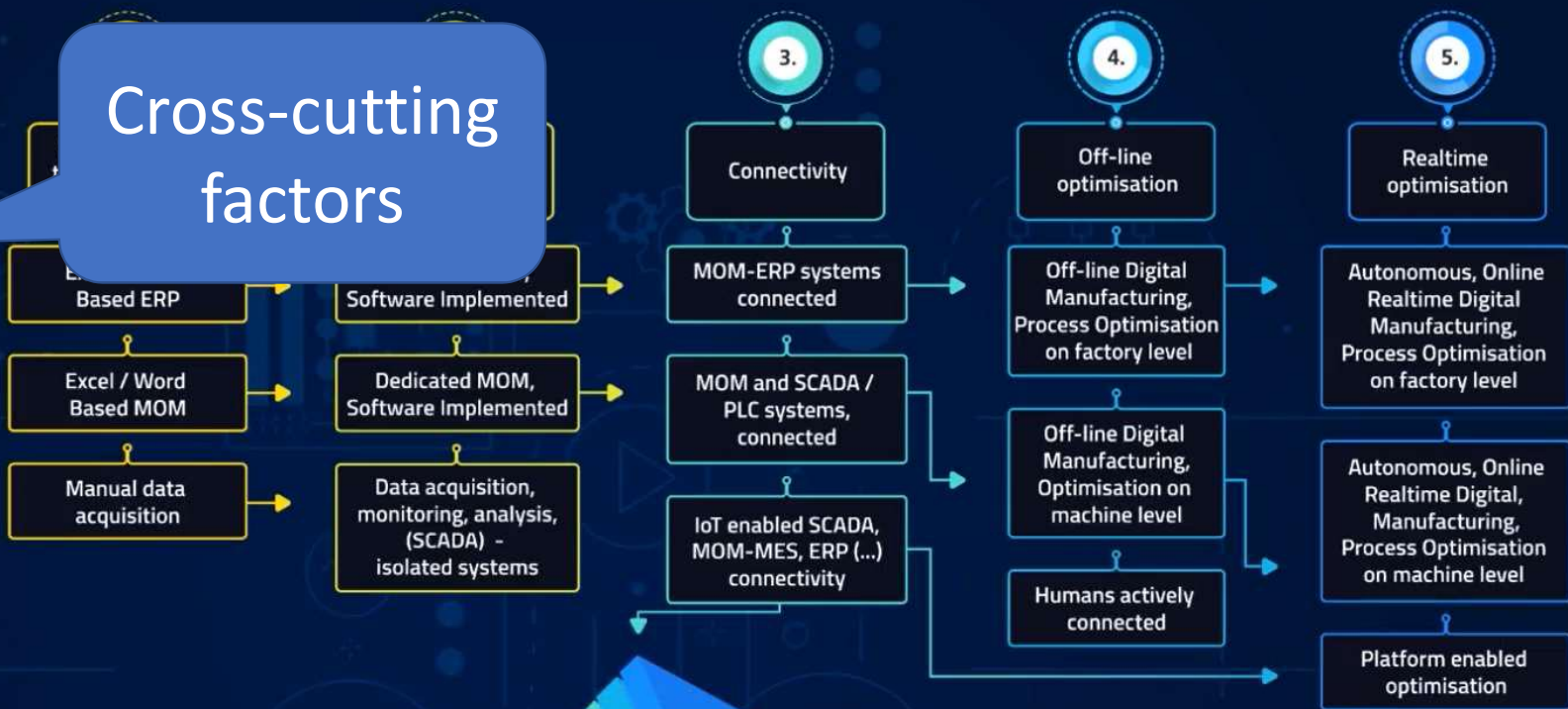
Security

Technology – building blocks

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PATHWAYS – MILESTONES

Cross-cutting factors



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 → pathways to digitalisation

Industrial state of play in manufacturing

Cases that illustrate advanced state of the art

Approaches & cases from research & innovation projects

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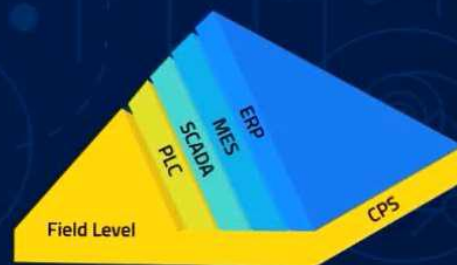
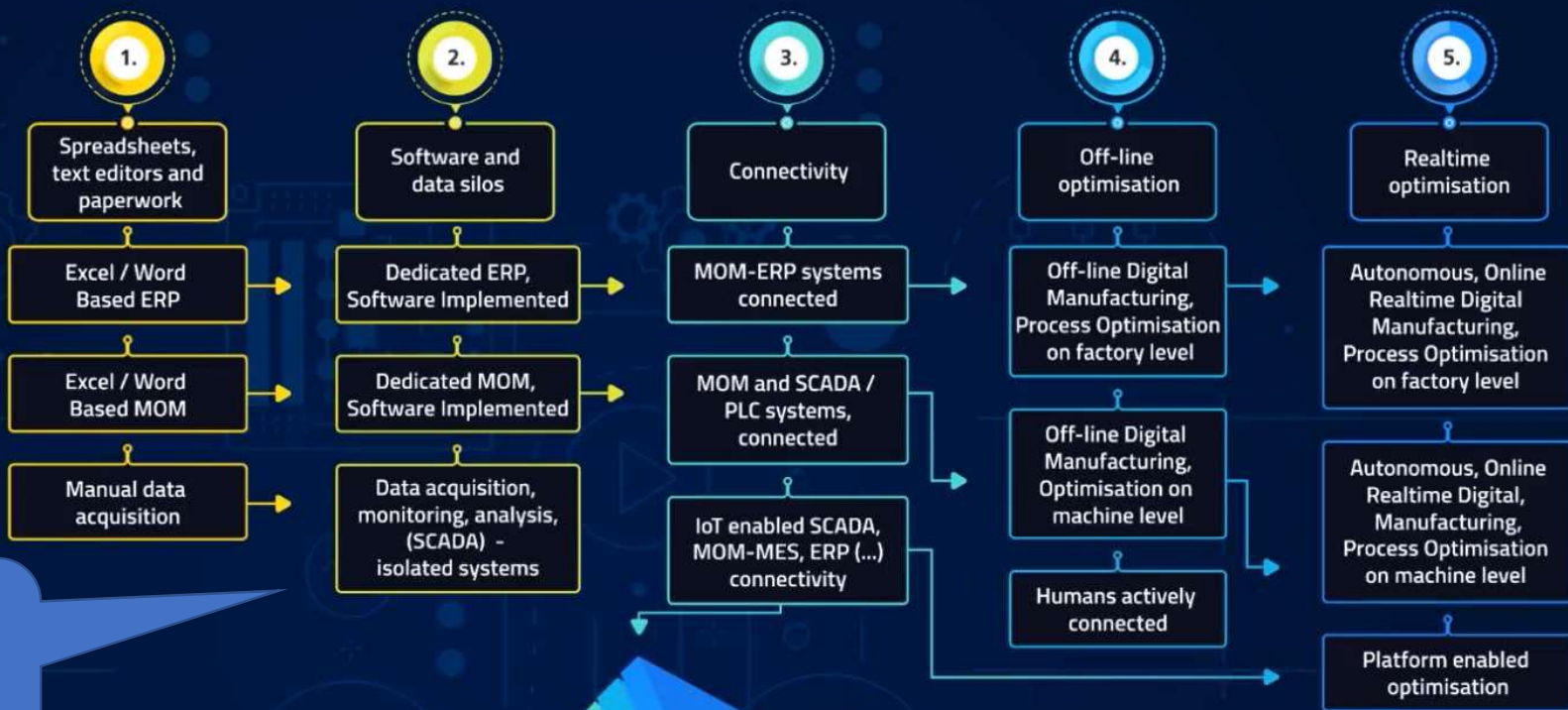
Techn

Pathways

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Industrial state of play in manufacturing

PATHWAYS – MILESTONES

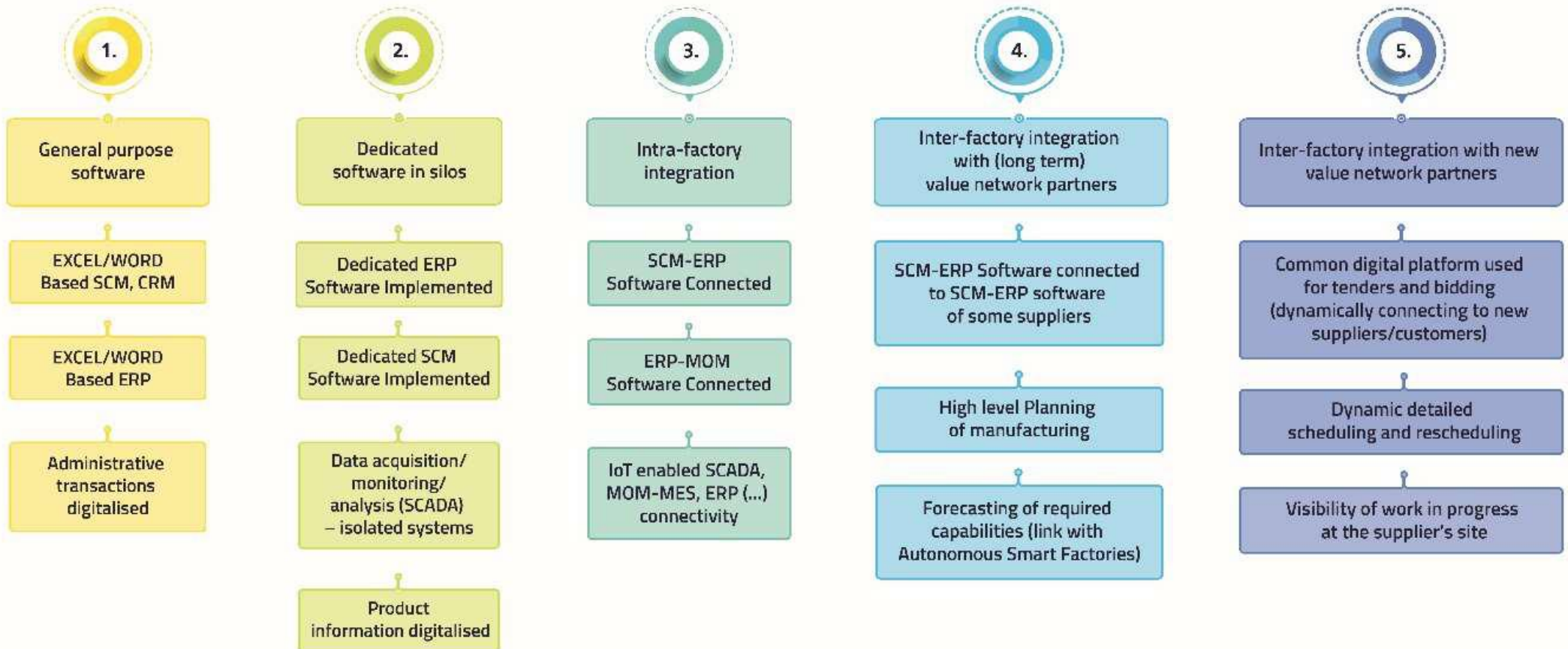


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 → pathways to digitalisation

Cases that illustrate advanced state of the art

Approaches & cases from research & innovation projects

PATHWAY – HYPERCONNECTED FACTORIES



Home

Structured Wiki

Show all

Added value and impact

Technologies and enablers

Digitalisation pathways

Standards, standardisation and regulation

ICT performance characteristics

Business model aspects

Projects

Search portal...

Structured Wiki / Digitalisation pathways

Structured Wiki

Digitalisation pathways

View Kanban

To expand the headers use the ▶ button.

Search:

Filter

▶ Autonomous Smart Factories

View Kanban

▶ Collaborative Product-Service Factories

View Kanban

▶ Hyperconnected Factories

View Kanban

▶ Security

View Kanban

Factory Automation Edge Computing Operating System Reference Implementation

[Full project page](#)



General purpose software View Kanban	Dedicated software in silos View Kanban	Connected IT and OT View Kanban	Off-line optimisation View Kanban	Realtime optimisation View Kanban
<ul style="list-style-type: none"> Spreadsheet/texteditor ERP Spreadsheet/texteditor MOM Manual data acquisition 	<ul style="list-style-type: none"> Dedicated ERP software implemented Dedicated MOM Software implemented Data acquisition/monitoring /analysis (SCADA) implemented but isolated The Analytics domain of the FAR-EDGE Platform is addressing data acquisition and analysis at the lowest level: optimizing the use of network and computing resources by applying Edge Computing patterns. 	<ul style="list-style-type: none"> ERP-MOM systems connected The Automation domain of the FAR-EDGE Platform introduced the concept of a Distributed Ledger as an decentralized aggregation/coordination layer positioned between legacy ERP/MOM/MES systems (centralized control) and Edge Gateways (distributed analysis and execution), which in turn are aggregators of IoT-enabled field devices. MOM-SCADA systems connected IoT enabled SCADA, MOM-MES, ERP (...) connectivity Humans actively connected 	<ul style="list-style-type: none"> Off-line Digital Manufacturing Process Optimisation on factory level Off-line Digital Manufacturing Process Optimisation on machine level The Virtualization domain of the FAR-EDGE Platform supports digital simulation, by means of which cyber-physical systems can be optimized following a what-if approach. Platform enabled optimisation 	<ul style="list-style-type: none"> Autonomous /online/realtime Manufacturing Process Optimisation on factory level Autonomous /online/realtime Manufacturing Process Optimisation on machine level

Introduction: Pathways to the digitalisation of manufacturing (Co...)

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