

European Roadmap for Industrial Process Automation

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processit.eu
Automation for process industries

Agenda

- Background
- Introduction – purpose, objective and needs
- Methodology
- 10 R&D areas
- 9 Game changers
- Relevant new and emerging business models
- Summary

Background

- Increasing global competition for process industries
 - Process industries needs to increase efficiency and productivity
 - industrial process automation
- Roadmaps from other initiatives surveyed – to position the ProcessIT.EU roadmap in the area

Introduction – purpose, objective and needs

Purpose

- To provide **guidance** and input for process industry companies, providers of industrial process IT-and automation solutions, researchers as well as policy makers and bodies/initiatives that craft calls for RDI-projects
- To provide an **insight** into what may need to be considered on strategic and tactical levels, in terms of objectives, R&D areas, game changers and business modelling, to keep and develop the competitive edge and initiative

Main objective

- European process industry to stay competitive, profitable and sustainable

Three top level needs

- Sustainable production
- Competence management
- Trust, security, safety and privacy

Methodology




State-of-the-art

Other initiatives and roadmaps

Trends

R&D areas

TODAY



Game changers

Stepping stones

Short- and long term objectives



Goals and visions

TOMORROW

10 R&D areas

**Sustainable
production**

**Competence
management**

**Trust, security,
safety and privacy**

Productivity, efficiency, scalability and flexibility

Sustainability through Circular Economy - Circular Economy through industrial internet

Distributed production/modular factories and services

Artificial Intelligence and Big Data

Autonomous plants and remote operations

Platform Economy

Cyber Security

Safety-Human, machine and environment

Competence and quality of work

Human-Machine Interfaces and machine-to-machine communications

9 Game changers

The game changers, “a matter that will have great impact and lead to significant change”, each comprise a number of R&D areas, which needs to be enough developed/matured in order to support the game changer

- Modular factory for distributed and automated production
- Live virtual twins of raw-materials, process and products
- Increased information transparency between field and ERP
- Real-time data analytics
- Dynamic control and optimisation of output tolerances
- Process industry as an integrated and agile part of the energy system
- Management of critical knowledge
- Semi-autonomous automation engineering
- Integrated operational and cybersecurity management

New and emerging business models

Currently most used: products, services, products with services, solutions etc.

New and emerging: Product-Service Systems or Industrial Product-Service Systems (PSS/IPS²), Functional sales, Functional Products etc. with new contractual parameters

Different: no warranty, additional customer value, contract parameter, potential sharing of risk and profit, risk assumed by provider side, continuous development, procurement process...

Expected Industrial Impact

Current situation:

- Existing business models such as Products and Services – need to keep those
- Rigid legacy systems and integrations within the production systems (à la ISA-95)

Wanted situation:

- Move towards smaller batch sizes or lot sizes
- Improve availability of production systems and overall equipment efficiency (OEE)
- Increase production output flexibility
- Improve flexibility to change the production system
 - Need to progress towards an increased production system utilization, which is hard without additional automation, new and more agile architectures (need to move from ISA-95 towards for instance RAMI 4.0)
 - Need to adapt to multi-stakeholder innovation and environments – suppliers, logistics, maintenance etc.
 - Need to be able share and use data/information in a multi-stakeholder environment

Effects of ProcessIT.EU roadmapping

- **ProcessIT.EU Network** – partnerships, project brokerages and proposals
- **Basis for won proposals** – e.g. Arrowhead (68M€), Mantis (80M€), Productive 4.0 (100M€), Aeroworks, Disire, EMC2, ProcessSME, Compinnova, EuroCPS, Far-Edge, R5-COP, iMINE, SIMS and WROOMM
- **Industrial use** – large European steel companies, Process industries, Manufacturing industries
- **Affects other R&D areas and roadmaps** – ECSEL, Artemis, AceForm...

Summary

- Industrial process automation is necessary to stay ahead and competitive
- 10 R&D areas which are critical to achieve 9 game changers
- New and emerging business models – PSS/IPS2, Functional Sales, Functional Products etc.
- The process industry within the EU needs to stay ahead on strategic and tactical levels and innovate itself on a regular basis to stay competitive, profitable and sustainable.

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