Alliance for Internet of Things Innovation

PLATTFORM INDUSTRIE 4.0

Business Future Images of Manufacturing and Service with IIoT

Future Images of Industry from Europe

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Robot Revolution & Industrial IoT Initiative
ロボット革命イニシアティブ協議会

The Robot Revolution and Industrial IoT International Symposium 2018, 19th October, Tokyo

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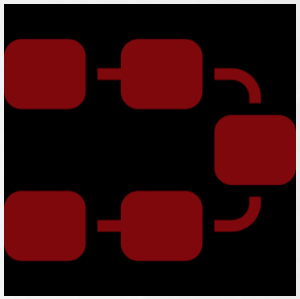
About: Strategy to create a Digital Single Market

Manufacturing sector in the European Union accounts for

- 2 million enterprises
- 33 million jobs and
- 60% of productivity growth



Industry, SMEs, researchers and public authorities make the most of new technologies

Path to digitise European industry...

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European Parliament
Think Tank

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Digitising European industry

24-05-2017

In response to the European Commission's recent efforts to advance the digitalisation of EU industry, the European Parliament's Committee on Industry, Research and Energy (ITRE) drew up an own-initiative report on the subject which is to be debated in plenary in May. The report proposes to develop an integrated strategy aimed at creating conditions conducive to reindustrialising the European economy so that it can fully benefit from opportunities offered by digitalisation.

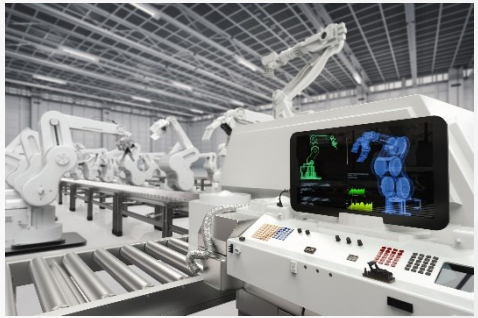
At a Glance | pdf ES DE EN FR IT PL


Creating a #DigitalSingleMarket
DIGITISING EU INDUSTRY
EU CLOUD
Digital public services
Standards
European Commission
#DigitiseEU

Digitising European Industry*

Some of the elements and facts
Manufacturing and Service with IIoT

- Research & Innovation Programme
- Regulations and IIoT Standards
- SMEs ~90 % < 250 Employees
- Convergence of OT and IT



* 2016: Internet of Things (IoT), Cloud Computing, Big Data and Data Analytics, Robotics and 3D Printing

Digitising European Industry*

For example: Robotics

- Research & Innovation Programme
- Regulations and IIoT Standards
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European Research and Innovation Programme

Horizon 2020 since 2014 Bugdet 80bn€
Horizon Europe from 2021 to 2027 Bugdet 100bn€

- EU Partnership (PPP)
  European Factories of the Future Research Association (EFFRA)
- **Our Example: Robotics, Cobotics and Services**
  Investigated and analysed in the EU mandate less from the point of view of technical feasibility than from the point of view of co-existence and interaction with and effects for and on humans - especially **for SME's**

EFFRA
EUROPEAN FACTORIES OF THE FUTURE RESEARCH ASSOCIATION

HuMan
HUman MANufacturing

MANUWORK

INCLUSIVE

AIOTI

European research and consortia landscape on IIoT

- European research and consortia landscape on IIoT (Industrial Internet of Things)strongly influenced by smart manufacturing and OT/IT convergence (AIOTI WG3)
- Central leadership on the part of Brussels is mostly united in the corresponding research and funding programmes under the umbrella of Horizont 2020 and the upcoming Horizon Europe

ICT Innovation for Manufacturing SMEs

- Factories of the Future initiative designed to support adaption of innovative ICT in EU manufacturing SMEs
- Eleven 'Factories of the Future' projects as Integrated Projects (IPs) and two 'roadmapping' projects

In regard of **Robotics** and **Cobotics** the following three ones are the most important:

HORSE

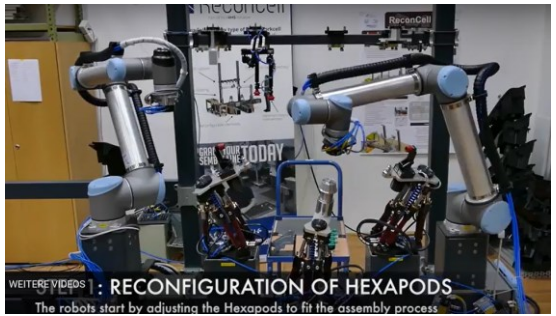
- Smart integrated Robotics system for SMEs controlled by Internet of Things based on dynamic manufacturing processes aims to bring a leap forward in the manufacturing industry proposing a new flexible model of smart factory involving collaboration of humans, robots,
- AGV's (Autonomous Guided Vehicles) and machinery to realize industrial tasks in an efficient manner.

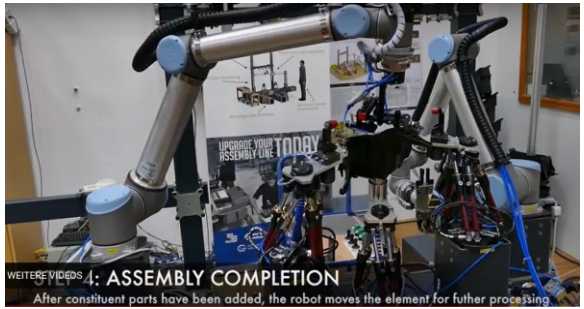
http://www.horse-project.eu/Pilot-Experiment-2

ReconCell

ReconCell

- proposes to develop a widely autonomous robotic workcell that will allow very short, self-adaptable and affordable changeovers under the conditions demanded and based on end-user needs.
- this will be achieved with the minimum use of additional resources over the system's lifetime

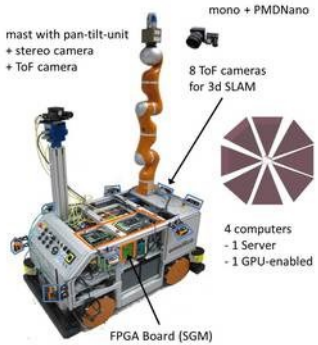




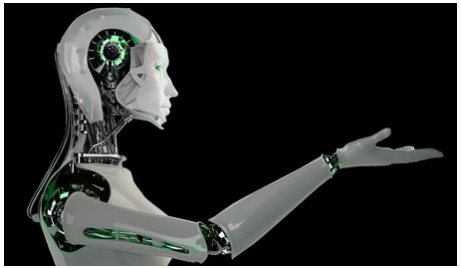
AITI

European Robotics Challenges

- Launch and run three industrially-relevant challenges
  - 1.) Robotics based Reconfigurable Interactive Manufacturing Cell
  - 2.) Robotics based Shop Floor Logistics and Manipulation
  - 3.) Robotics based Plant Service and Inspection
- Empowering robotics platforms and benchmark infrastructures
- Sustainability and adaptability to end users

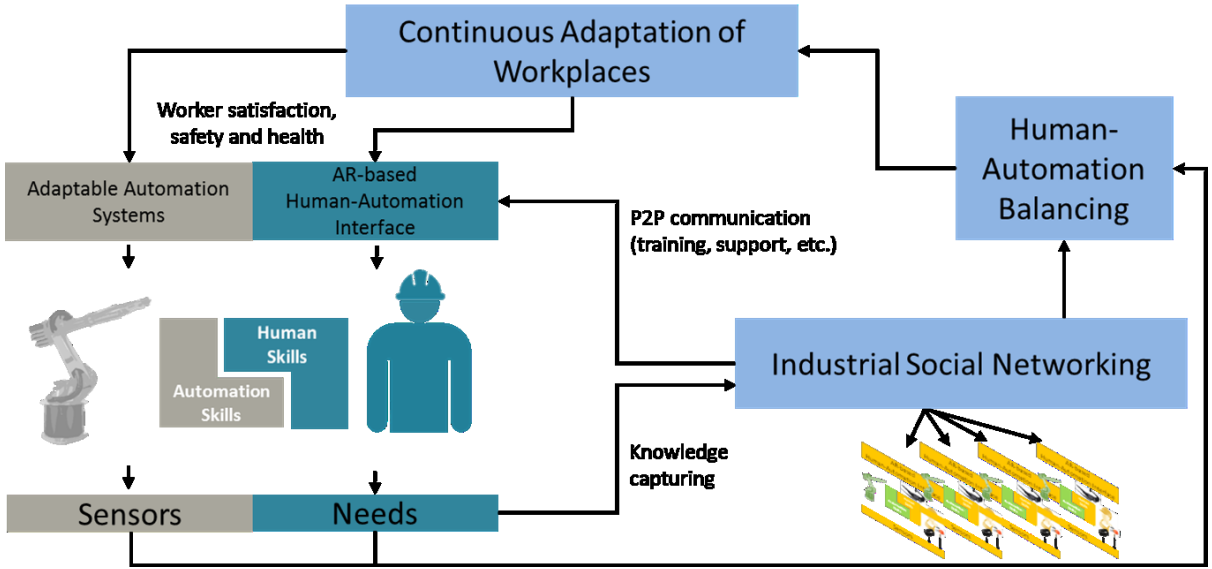


Man/Machine Interfacing and Robotics



- Aim of the project is a healthy workplace of workers to increase the competitiveness of manufacturing companies by creating optimal environment. Support the integration and cooperation of human automation.
- Support the worker on the production line with specific instructions for carrying out certain activities. This is achieved through the use of Augmented Reality.
- Increases the well-being of the worker through the use of a (robotic) exoskeleton to help the worker make specific efforts and prevent and avoid possible injuries, which also has a positive effect on productivity.
- The virtual modelling of the factory aims to monitor production performance in manufacturing using values obtained from a virtual representation of the plant based on the real production environment.

Framework for workplace adaptation



Human-automation load balancing method

- Robotics and Cobots: Develop a human-automation load balancing method that determines the optimal trade-off between automation and human involvement at a shop-floor workplace, taking into account the needed flexibility for the process, the available Skills (offered both from human and machines), the safe integration of human and automation into the process and the overall load of the line.
- Develop a method for measuring worker satisfaction, safety and health at work, i.e. "ergonomics climate", via an online estimation of factors using a set of sensors at the shop floor. (i.e. SAMSUNG Gear, FitBit)
- Develop an advanced shop-floor tool, facilitating AR technologies, (i.e. Google Lens, Microsoft Hololens) which will be used for knowledge capturing, networking, guidance and decision support. This will be developed through a user-centred development approach based on usability engineering lifecycle methodology with the assistance of an expert group consisted of human and social scientists and engineers.

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STANDARDIZATION COUNCIL INDUSTRIE 4.0

LNI4.0 LABS NETWORK INDUSTRIE 4.0

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THE CONCEPT FACTORY OF FUTURE "en France"

The Factory of the Future is a generic concept that is part of a general awareness of the importance of the manufacturing industry in the national wealth.

The Factory of the Future is a response to several simultaneous transitions: energetic, ecological, digital, organizational and societal.

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Line Information System Architecture (LISA)

- The aim of this project is to develop a **Line Information System Architecture (LISA)** that can be used in industrial production systems in general and in automotive discrete manufacturing specifically.

- This architecture aims at capturing raw data from the plant of a production system and transforming these data into understandable and coherent information in order to ease production management decisions.


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