Industry 4.0

Digital Transformation in Industry

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OPTIMAI

The European Industry

Industry is a fundamental pylon of the European economy:

› Includes 80% if exports

› Offers work to 20% of European citizens

The European industry has a long tradition in innovation and high-quality standards, but globalizaiton

› has increased competition from rising economies (e.g., China)

› has created new challenges, re. production processes

Industries pursue **new ways to improve quality control** for products as well as manufacturing procedures.

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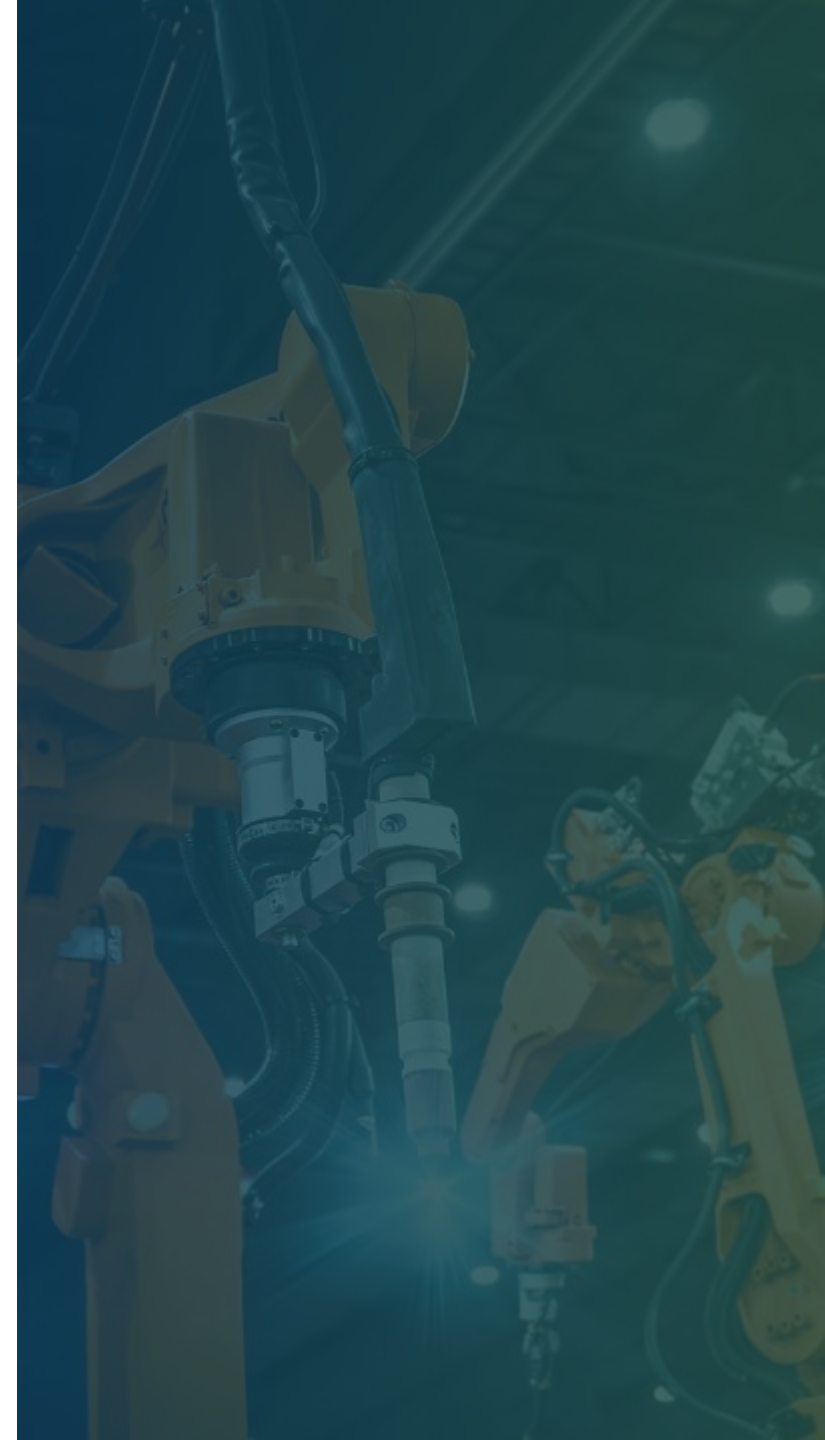
Digital Transformation

The digital transformation of industry target the creation of a new European Industrial Ecosystem:

› Targets to develop new solutions for production optimization.

› Minimization of defective products.

› Personnel training.

› Preservation of European Industry for future generation.

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European Research

European Research within Industry 4.0 aims:

› to provide solution to existing and rising challenges.

› to exploit potential and scientific knowledge in Europe.

› to build on innovative ideas of the European state-members.

OPTIMAI (2021-2023)

OPTIMAI is a research project that aims to enhance digital transition of European Industry and includes:

› Networks of smart sensors, and smart data transaction in manufacturing lines.

› Technologies of Artificial Intelligence for the detection of defects in the manufacturing line.

› Re-routing defective products in alternative production paths (recycling, repair, etc.).

› Development of Digital Twins and Virtualization of the manufacturing processes.

› Technologies of Augmented Reality for the communication between machines and their operator.

All these technologies will compose the OPTIMAI Decision Support Framework.

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❑ The main goal of the project is to optimize the balance between **fast, efficient and reliable production parameters** which have a significant impact in industrial competition, through a unique combination of Metrology, Artificial Intelligence, Visualization and Augmented Reality.

❑ 14 partners work on OPTIMAI; 4 of them are located in Greece (CERTH, FORTH, UTH, and KLEEMAN).

❑ **CERTH, FORTH and the Dept of Energy Systems (UTH)** work on the development of systems for Zero-Defect Manufacturing and Quality Control.

❑ **KLEEMANN**, one the major elevator manufacturers in the European and Global market, is one of the three Pilots of the Project, and will employ the developed technologies in their premises.

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UTH Participation

› The University of Thessaly (UTH) focuses on the investigation and development of **State-of-Art Technologies of Artificial Intelligence**, which will be embedded in the Quality Control Processes, targeting **defect identification** in manufacturing lines.

› Special focus is given in Artificial Intelligence for Metrology, Digital Twins, Internet of Things (IoT) sensors, Computer Vision, Augmented Reality, Quality Control and Zero-defect Manufacturing.

› The models under development can exploit data collected by **sensors along the production lines and recognized defective products.** In such a case, the operator is informed using Augmented Reality systems, so that they can intervene by stopping production or trigger maintenance activities.

The AI algorithms under development will be used for detection of defects in **microscopic scale (circuit boards)**, as well as other industrial processes like **antenna assembly and elevators**.

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☐ The project is expected to have **strong impact in European Industry**, while the development of SoA technologies and their direct application by Greek partners will **enhance the growth and development of Greek Industry**, as well.

https://optimai.eu/