AI·PROFICIENT

***A**rtificial **i**nte**l**ligence*
for improved *pro*duction ef*fici*ency,
qua*l*ity and mai*nt*enance

Our Scope

AI-PROFICIENT aims to improve manufacturing processes in terms of production efficiency, quality and maintenance, by combining human knowledge with AI capabilities (human-machine interaction). The overall goal is to increase the positive impact of AI technology on the manufacturing process as a whole, while humans assume supervisory (human-on-the-loop) and executive (human-in-command) roles.

> ***« Using AI technology to improve manufacturing »***

Our Strategy and Objectives

AI-PROFICIENT will develop a technical and business ecosystem to showcase the potential that advanced AI technologies bring in production plants, alongside with human interaction. In this regard, AI-PROFICIENT proposes an evolution from hierarchical and reactive decision making for plant automation, towards self-learning and proactive control strategies. This will be achieved by:

- creating the AI-PROFICIENT platform for digitalized production plants, that will integrate existing and emerging AI technologies and local intelligence of smart components at system edge, to enable agile production processes and improved operation planning and execution, while increasing the Overall Production Efficiency.

- piloting the AI-PROFICIENT solution in 3 production plants of different manufacturing domains, under alternative use case scenarios. Pilots will involve AI-enabled predictive fault detection, diagnostics and proactive maintenance features, demonstrating AI's potential to improve the quality of products and processes.

- identifying the effective means for human-machine collaboration, while respecting privacy, safety and security requirements and respective ethical principles. The goal is to enable the AI decision-making explainability and transparency, as well as the reinforcement mechanisms based on the human knowledge and feedback, to improve the trustworthiness of AI in manufacturing domain.

Our Targets

AI-PROFICIENT aspires to make a decisive step in introducing true AI enabled manufacturing and industrial processes to the solution market serving industry. AI-PROFICIENT will focus on the automotive and chemical process industries but will be also applicable to other sectors where manufacturing processes and operations with a certain level of automation exist. The functionalities to be provided by AI-PROFICIENT indicatively include Diagnostic and (early) anomaly detection, Health state evaluation, Hybrid models of production processes and digital twins, Predictive Production quality assurance, Opportunistic maintenance and explainable/transparent decision-making. These will be accomplished using advanced AI techniques i.e. Deep/machine/reinforcement learning, explainable AI, semantic analysis and complex event processing. Having in mind that AI services of AI-PROFICIENT aim to provide advanced control automation, the domain of industrial automation is also one of the target market segments. Our target customer segments include: i) manufacturers (large companies and SMEs), coming from almost any sector of the manufacturing industry, ii) providers of automation and monitoring systems and iii) connected worker solutions providers (i.e industry-grade wearables).

« The AI-PROFICIENT solution considers the provision of core AI services under an IIoT environment, while integrating with existing information systems, plant automation and shop-floor personnel's workflows »

Our Use Cases

The 3 different operation environments that will run the pilots are provided by 2 manufacturing enterprises:

- CONTINENTAL, tyre manufacturing with Combiline system for rubber preparation, extrusion and cutting in the Sarreguemines plant (France);

- INEOS, producing petrochemicals with two plant facilities for production of polypropylene polymers in Geel (Belgium) and Cologne (Germany) plants.

With their collaboration, AI-PROFICIENT will ensure the end-user engagement throughout the project lifetime, considering requirements specification, deployment and validation, as well as development of recommendations for ethical principles for trustworthy AI in manufacturing domain.

PROJECT TITLE

Artificial intelligence for improved production efficiency, quality and maintenance

START DATE

1st of November, 2020

DURATION

36 months

FUNDING PROGRAMME

H2020-EU.2.1.1. - INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)

TOPIC

ICT-38-2020 - Artificial intelligence for manufacturing

FUNDING SCHEME

RIA - Research and Innovation action

TOTAL EU CONTRIBUTION

€ 5.467.698,75

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This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 957391.