By combining predictive and prescriptive maintenance techniques, the ITEA project PIANiSM aims to achieve an end-to-end manufacturing process while optimising value chains. Its three-layered approach to I-IoT, analytics and applications will allow for easily adoption in new domains.

**ADDRESSING THE CHALLENGE**
In manufacturing, equipment failure impacts product quality and can result in large revenue losses, so maintenance should ideally reduce costs and downtime while increasing equipment lifespans. Thanks to a combination of Industry 4.0 and Industrial Internet of Things (I-IoT), manufacturers can now collect and analyse huge amounts of data, paving the way to predictive maintenance (PdM) using techniques such as regression analysis, forecasting and pattern matching. While the benefits are widely accepted, most existing solutions are domain- or problem-specific. Unfortunately for many companies, the implementation costs and complexity remain an obstacle to uptake and force them to follow traditional processes.

**PROPOSED SOLUTIONS**
To disrupt these processes and enable a large-scale transition to PdM, the PIANiSM (Predictive and Prescriptive Automation Smart Manufacturing) project will create a system covering data science, machine learning, analytics, simulation and real-time processing. The main output will be an implemented, collaborative framework consisting of three layers that support all stages of the digital transformation: (1) an I-IoT platform; (2) an analytics platform; and (3) applications, dictionaries, model and problem libraries and PdM roadmaps.

PIANiSM will also provide missing analytics techniques and algorithms and introduce data identification & integration/modelling processes to enable flexible solutions for manufacturers. The system will be independent, allowing for uptake across multiple domains; the consortium therefore involves eight use-cases from fields as diverse as water pumps and transport robots.

**PROJECTED RESULTS AND IMPACT**
PdM is becoming indispensable to enterprises that wish to remain competitive in the crowded world of manufacturing: between 2016 and 2022, the predictive analytics market is expected to grow from USD 3.85 billion to 12.41 billion at a 22.1% CAGR. With its layered structure, PIANiSM will be completely unique in this environment, allowing companies to make bigger breakthroughs than are possible with current tools. Per use-case, on average a 55% reduction in breakdown costs, a 20% reduction in the number of failures and a 30% reduction in downtime hours are expected. Measured in euros, on average a 29% drop in maintenance costs and equipment investments will also be possible for all use cases in the project. Through this, PIANiSM plays an important role in the digital transformation that will open the door to new innovations in years to come.
ITEA is a transnational and industry-driven R&D&I programme in the domain of software innovation. ITEA is a EUREKA Cluster programme, enabling a global and knowledgeable community of large industry, SMEs, start-ups, academia and customer organisations, to collaborate in funded projects that turn innovative ideas into new businesses, jobs, economic growth and benefits for society.

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