



## MODAPTO [101091996]: Modular Manufacturing and Distributed Control via Interoperable Digital Twins

# Press Release

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### **New research project aims to revolutionize production systems supporting Modular Manufacturing and Distributed Control**

Working towards a more flexible and adaptable industrial environment that can respond effectively to dynamic production requirements or changing market conditions.

Industry 4.0 represents the future of manufacturing, with a focus on seamless connectivity, automation, and the merging of physical and digital realms. [MODAPTO, a new Horizon Europe funded research project](#), embraces this vision by harnessing the potential of Digital Twins (DTs) (i.e. virtual representations of each component or entity within a production system), for creating **flexible industrial systems**, capable of quickly adjusting to meet changing demands, product variations, or market conditions.

The project, motivated by the six principles of Reconfigurable Manufacturing Systems (RMS), (i.e., modularity, scalability, convertibility, diagnosability, customization, and integrality), aims at promoting a combined view of these characteristics, to develop system practice-based industrial strategies for reconfiguration. Specifically, MODAPTO project will work on a new era of intelligent and agile manufacturing, where the integration of smart and connected Digital Twins (Interoperable DTs) revolutionizes the way components are optimized and modified.

In the context of industrial systems, Digital Twins are virtual models that replicate physical manufacturing assets, such as machines, equipment, or entire production lines. Interoperability refers to the ability of these Digital Twins to communicate, exchange data, and interact with other systems or components within the industrial ecosystem. These interconnected DTs enable real-time monitoring, analysis, and communication, empowering manufacturers to easily modify, optimize, and fine-tune their production processes like never before.

In fact, MODAPTO will offer a framework for modular manufacturing that is adaptable to the custom needs of many production modules, processes, and manufacturers, supporting high level design, reconfiguration and optimization decisions. Also, the project enables distributed intelligence and control across multiple interconnected devices or components within a system, via interoperable DTs.



MODAPTO will also lead the development of business models that will facilitate its transferability to other sectors and the adoption of its derived industrial strategies, especially by SMEs. The latter will be further enhanced via outreach activities, through national and regional industrial and academic clusters and initiatives. Moreover, it will be supported by knowledge transfer via workforce training and train-the-trainers' approaches.

Within the project's 3-year duration, three (3) use cases will be deployed, involving four (4) different manufacturers facing complementary challenges to the modular design and reconfiguration of machines, processes and production.

These use cases offer a wide range of testbeds, highlighting that the MODAPTO approach can be adapted to handle a plethora of different modular manufacturing aspects, leading to substantial improvements of KPIs related to efficiency, cost, quality, decision making, energy and environmental aspects.

As Mr. George Triantafyllou, Senior Project Manager in Athens Technology Center and the project's coordinator, stated, *"through this innovative research, MODAPTO aims to empower industries engaged in modular manufacturing to achieve unprecedented levels of flexibility, efficiency, and productivity. By leveraging the intelligence and connectivity of DTs, manufacturers can rapidly adapt their production systems to accommodate changing demands, respond swiftly to market trends, and continuously optimize their operations."*, while also adding that *"we aspire that the benefits of this pioneering R&D project extend beyond increased agility and responsiveness. With smart and connected DTs, manufacturers can unlock insights into the performance, health, and predictive maintenance needs of each component in their production systems. This level of detailed information enables proactive decision-making, reduces downtime, and enhances overall equipment effectiveness."*

MODAPTO project is a collaboration between 13 partners in 6 different countries:

- 4 manufacturers (FFT Produktionssysteme, SEW- USOCOME, Centro Ricerche Fiat, Itar-Italbox Industrie Riunite Spa)
- 4 research organizations (Fraunhofer, Université de Lorraine, University of Piraeus, Athens University of Economics & Business),
- 5 innovation companies/organizations (Athens Technology Center, EKS InTec GmbH, BOC Group, AEGIS, Lithuanian Innovation Center)

#### **Disclaimer**

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