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CT redefines automation to address mass customization in the industry of the future

- **CT is part of the ADAPTA R&D project, working on factory virtualization through MBSE, developing a digital twin to enable agile reconfiguration of production processes and optimize efficiency in mass customization.**
- **The model is designed to increase the productivity of factories that work with constant variability in their production.**
- **The initiative is funded by the TransMisiones program of the Ministry of Science, Innovation and Universities of the Government of Spain.**

Mass customization is a strategy that enables companies to tailor their products to specific customer needs while maintaining low costs and high efficiency. However, this approach poses significant challenges to traditional automation strategies, which often require large investments and long payback periods.

In order to overcome these limitations, the ADAPTA project seeks to create a flexible and reconfigurable production model that provides factories with a high capacity for adaptation and resilience to changes in the environment. To this end, the project will seek to improve the perception capabilities of current robotic systems through solutions based on vision and artificial intelligence (AI), integrated sensors and 2D and 3D images.

The initiative will also work on developing handling systems that can adapt to unknown or changing situations with minimal human intervention and that take into account the presence of people and their interaction with them, favoring a collaborative productive environment.

As part of a multidisciplinary consortium led by Tekniker, CT is working along two key lines to address the challenges of mass customization of products in industrial environments. This approach seeks to provide innovative tools that enable factories to adapt quickly to changing market demands, maximizing efficiency and reducing costs.

On the one hand, the company focuses on analyzing the bidirectional relationship between the elements of an industrial factory, with the aim of facilitating an agile reconfiguration of the production process. This effort is part of the model-based system engineering (MBSE) concept, which promotes advanced virtualization of production plants.

In addition, CT experts are developing a digital twin designed to meet the needs of this reconfiguration. This system, conceived as software agnostic, will enable companies to anticipate different production scenarios and to quickly respond to dynamic situations required by customers.

The project, which has just started, is already making significant progress. The initial specifications have been defined in collaboration with the companies in the ADAPTA consortium, and the necessary know-how is being acquired to integrate the different software that will make up the virtualization of the factories. Although ADAPTA is expected to be developed over the next two years, CT is working on a tighter schedule to deliver the virtual foundations that will underpin the following consortium developments.



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Validation in a real environment

The methodology proposed by the ADAPTA project includes the validation of the results obtained in an industrial scenario. These results will be provided by the company Schröder, project partner, in its luminaire assembly plant located in the province of Guadalajara, where the multinational group concentrates approximately 50% of its worldwide production.

Specifically, three representative use cases of handling, assembly and logistics operations will be tested in multiple production scenarios: the loading and unloading of product on a painting line, the collaborative assembly line and the autonomous loading of pallets of finished product onto trucks.

About ADAPTA

Funded by the TransMisiones program of the Ministry of Science, Innovation and Universities of the Government of Spain, the ADAPTA project has a consortium coordinated by Tekniker and integrated by Smarttech, CT Ingenieros de Catalunya Aeronáuticos, de Automoción e Industriales, Automatización de Sistemas y Aplicaciones Industriales (ASAI), División Industrial Artisteril, Bcnvision, Schröder Socelec, Eurecat and Universidad Carlos III de Madrid.

About CT

CT is a leading engineering company throughout the complete product lifecycle. For more than 37 years, our mission has been to provide innovative services and technological solutions that help our clients be more effective and competitive. Today, CT's success is driven by 2.000+ engineers in seven countries providing end-to-end expert support to leading customers in the aeronautical, space, naval, automotive, railway, energy and industrial plant sectors.

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