

Mass Customization and product variety management

Nowadays, and with the increase of consciousness about climate change and sustainability, the world is shifting towards producing what is necessary and needed and hence industries are shifting from Make-to-Stock strategy to a Make-to-Order strategy where production occurs after customer order placement. This allows them to satisfy an increasingly demanding customer requiring more personalization and products reflecting her/his individuality, hence customized products.

Mass Customization aims at providing unique products satisfying individual customer needs with a price and efficiency similar to that of mass production. This requires different capabilities such as production flexibility, modular product design, automated production, and high coordination with the supply chain. It also requires a product configurator, also known as mass customization toolkit is a knowledge-based system responsible for adapting a product according to specific customer needs.

Mentors



Joanna Daaboul is currently the director of international relations and an assistant professor at Université de Technologie de Compiègne and a member of the Roberval laboratory (Mechanics energy and electricity) and the excellence laboratory MS2T (Control of Technological Systems-of-Systems). She received her engineer's degree in industrial engineering from Lebanese American University in 2008 and her doctoral degree in mechanical engineering from Ecole Centrale de Nantes in 2011. Her main research interests include integrated product and process design, product/process variety management, reconfigurable manufacturing systems, modular system design and mass customization. She participated in three European projects (Suplight FP7- NMP-2010-3.1-1, SMCS FoF-NMP-2010-2, and DOROTHY FP7-NMP-2007- SMALL-1) and coordinated a national research project for young researchers (IPROD, ANR-17-CE10-0010).
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Student profile

Master in industrial engineering, or final undergraduate in industrial or mechanical engineering

Subjects

Modular product design for mass customization

Product configurators

Production planning and management for flexible manufacturing systems and mass customization

Supply chain 4.0: focus on vertical and horizontal integration

Sustainable mass customization