
Ontology development to support integrated modular design for Mass Customization

Rachel Campos Sabioni*¹, Joanna Daaboul*¹, and Julien Le Duigou*¹

¹Sorbonne Universités, Université de Technologie de Compiègne, UMR 7337 Roberval – Université de Technologie de Compiègne – France

Résumé

Abstract- With the increasing demand for customized products, companies must adapt their products and manufacturing processes to be cost-effective, flexible and responsive to market changes. Modularity in product and process (i.e. Reconfigurable Manufacturing Systems - RMS) is known as an essential enabler for developing mass-customized products. The product variety for mass customization (MC) can be increased by product and/or process reconfiguration. To take advantage of the entire system reconfigurability, the design of modular products and RMS reconfiguration for MC need to be addressed in an integrated way. The complexity of integrating modular product and RMS design requires a knowledge base capable to represent the whole system. This paper proposes a conceptual model called Integrated Modular Product and Process Design (IPROD), which integrates the product module selection and RMS configuration, taking into account customer requirements, for optimizing MC offer. After a review and comparison of related works, the IPROD model is presented through an ontology that semantically represents the relations among the elements of this integrated system. The model proposed in this paper will be further developed in future works in order to formulate and solve a concurrent optimization problem of product module selection and RMS configuration for MC.

*Intervenant