The impact of applying product-modelling techniques in configurator projects

This paper aims to increase understanding of the impact of using product-modelling techniques to structure and formalise knowledge in configurator projects. Companies that provide customised products increasingly apply configurators in support of sales and design activities, reaping benefits that include shorter lead times, improved quality of specifications and products, and lower overall product costs. The design and implementation of configurators are a challenging task that calls for scientifically based modelling techniques to support the formal representation of configurator knowledge. Even though extant literature has shown the importance of formal modelling techniques, the impact of utilising these techniques remains relatively unknown. Therefore, this article studies three main areas: (1) the impact of using modelling techniques based on Unified Modelling Language (UML), in which the phenomenon model and information model are considered visually, (2) non-UML-based modelling techniques, in which only the phenomenon model is considered and (3) non-formal modelling techniques. This study analyses the impact to companies from increased availability of product knowledge and improved control of product variants. The methodology employed is an exploratory survey, followed by interviews with 18 manufacturing companies providing customised products. The results indicate that companies using UML-based modelling techniques tend to have improved documentation of their product knowledge and an improved ability to reduce the number of product variants. This paper contributes to an increased understanding of what companies can gain from using more formalised modelling techniques in configurator projects, and under what circumstances they should be used.