

Chapter 10

CONCLUSIONS

Customization is a continuously growing business trend that aims at providing customers with individualized goods and services. In dynamic business environments, it is even a necessary condition in order to maintain competitive advantage and outpace competitors. The discussion presented in this book concentrates on the challenging case, in which manufacturing enterprises strive for customizing physical goods by taking into account the costs' efficiency perspective. Mass customization is an oxymoron that joins both perspectives of product customization and mass production efficiency into one concept. In order to lead mass customization to success, there are some necessary conditions to be satisfied. A distinction should be essentially made between the conditions to be satisfied before shifting to mass customization and those to be maintained and further developed during the pursuit of the strategy.

Mass customization induces a high level of product variety, which increases the internal complexity in operations and manufacturing related tasks. The effects of complexity generally arise in the form of hidden costs that trigger efficiency problems. Mass customization involves high production program complexity, high configuration complexity for customers and increasing planning and scheduling complexity. However, mass customization not only increases complexity, but it has some potential for reducing complexity. The pursuit of mass customization drives the reduction of complexity at three main levels, which are: the order taking process, product and inventory. The success of mass customization can only be reached if the complexity increasing factors are adequately managed. Another important issue for the achievement of a successful mass customization is an optimal understanding of customers who should be considered as partners in the value creation process. In the specific context

of mass customization, customer needs are frequently misunderstood. It frequently occurs that customers find out that the selected product configuration does not exactly meet their expectations right after delivery or during consumption. The model making the distinction between the subjective and objective customer needs reveals many insights about the nature of customer requirements in mass customization. The subjective customers' needs are the individually realized and articulated requirements, whereas the objective needs are the real ones perceived by a fictive neutral perspective. The subjective needs are explicit and lead to sub-optimal customer satisfaction. But the objective needs are implicit and yield optimal customer satisfaction. The customer needs' model provides interesting clues for making optimal decisions concerning the variety steering problem. It suggests the elimination of the over engineered variants that neither correspond to the subjective nor to the objective needs. Another important result is that the product variants that only correspond to the subjective customers' needs have to be eliminated. These product variants are especially problematical because they confuse customers. Since customers identify their subjective needs, they may believe that a product alternative is optimal. However, there is another product variant in the solution space that fulfills the objective requirements. The result is that customers select product variants that do not exactly meet their requirements. In addition, the model suggests that customers can better recognize their objective needs if the external complexity faced during the product configuration process is considerably reduced.

The customers' needs model for mass customization reveals that customers have to be adequately supported during the product selection process in order to make them identify their objective needs. In the web-based mass customization, the customer assistance task is supposed to be ensured by online configuration systems. These software tools enable the customer-supplier interaction and should play an important role in the customer needs' elicitation process. However, the examination of the morphological box that includes the main dimensions according to which the configuration systems are developed, suggests that the state of the art configurators are very product oriented. They assume that customers are able to make rational decisions in extensive variety contexts, which is not true because large variety confuses customers. In order to mitigate this main drawback, the extension of configuration systems with an advisory system is necessary. This software system takes over the relevant task of capturing the objective needs and assisting customers during the decision-making process. For the development of the advisory system, two main steps were necessary. The result of the first step is a software system that is based on a hybrid approach including a knowledge base and recommender techniques. This