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On the evaluation of product customization strategies in a vertically differentiated market

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ABSTRACT

This paper presents a formal approach to evaluate the value of enhancing product customization in a vertically differentiated market. Different from most existing studies that tend to associate the level of customization with the number of product variants, we take a rather different view to the level of customization which we define as the degree to which consumers are involved along the value chain. Consequently, a higher level of customization is achieved when consumers are involved further upstream in the chain. The novelty of our approach stems from the integration of both marketing- and production-related factors that enable us to: consider trade-offs between customization, lead times and manufacturing costs; and analyze how these trade-offs should be addressed in a market in which one group of consumers is highly concerned about product customization, whereas the other group is more concerned about lead time. Through numerical examples, we demonstrate how the interplay between marketing- and operation-related factors affects firm's decision on the most appropriate level of customization.

1. Introduction

It can be argued that mass customization (MC) represents an essential manufacturing concept for firms striving to maximize the value that their customers derive from buying their products. This new manufacturing concept replaces mass production which is viewed as unsuitable for the present competitive environment (Pine, 1993). This is achieved by allowing customers to individually customize a product that closely matches their individual preferences without significantly compromising cost efficiency. Advances in manufacturing and internet-based information technologies are believed to be the focal enablers, which allow successful MC application in many product categories. For example, Dell allows customers to customize their notebooks; Timbuk offers customized bags; Nike and Adidas allow customers to create their most preferred trainers.

All the above examples are similar in that customers are given the freedom to choose the product specification (among abundant possible options) that best matches their individual preferences. Thus, customers are involved in the production processes, though to a limited extent. One can argue that this customer involvement marks a distinctive characteristic of MC from the more traditional concept that simply increases the number of product variants in response to the demand for variety. But one could also take a different view, arguing that MC would need a greater level of customer involvement than merely choosing among a large number of permutations. We agree with Lampel and Mintzberg (1996) and Duray et al. (2000) who suggest that the relative degree of product customization is determined by how far consumers are involved in the production cycle. A highly customized product is characterized by customer involvement in the early design stages. In contrast, the level of customization is low if customer preferences are included only at the final assembly stage (see Fig. 1).

While the existence of the two different views of customization cannot be disputed, it should be underlined here that since our main interest is to consider customization level determined by how far the customer can involve in the production cycle, the number of product variants becomes an irrelevant decision variable for the manufacturer. One could argue that whether the customer is involved at the fabrication stage or at the design stage of the production cycle, there could be an infinite number of product variants offered to the customer. However, it is arguable that involving the customer earlier at the design stages will enhance the perceived uniqueness of the product, which in turn contributes positively to the utility a customer experiences (Franke and Schreier, 2008). The consideration of the production and marketing factors in this paper allows us to examine how the choice of the customization level has an impact on the manufacturer's profitability by capturing the interplay between the

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