Configuring Product Modularity and Service Modularity for Mass Customization Strategies

Bask, Anu; Hsuan, Juliana; Rajahonka, Mervi; Tinnilä, Markku

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Anu Bask, anu.bask@aalto.fi
Aalto University School of Business, Finland

Juliana Hsuan, jh.om@cbs.dk
Copenhagen Business School, Denmark

Mervi Rajahonka
Aalto University School of Business, Finland

Markku Tinnilä
Aalto University School of Business, Finland

Summary Abstract (max 100 words)

Service modularity is an emerging field of research, and there has been a growing interest on how it can contribute to service design and operations management. In this study we develop a framework to assess configurations of the bundling of products and services through modularization strategies, and how such configurations become the foundations for mass customization strategies. As a result we identify critical characteristics that are relevant for both product and services, and suggest a conceptual framework consisting of twelve dynamic mass customization strategies with paired product and service modularity. Case examples are used for illustration of different strategies.

Keywords: Modularity, Strategy, Mass customization

Purpose

Modularity has been recognized as a powerful tool for improving the efficiency and management of product design and manufacturing (see e.g., Baldwin and Clark, 1997; Muffatto, 1999; Ulrich, 1995; Mikkola, 2006; Lau *et al.*, 2007; Jacobs *et al.*, 2007). Service modularity is an emerging field of research, and there has been a growing interest on how it can contribute to service design and operations management (see e.g. Voss and Hsuan, 2009; Bask *et al.*, 2010; de Blok *et al.*, 2014). Modularized product/service design, flexible processes and integration between supply chain members are means for achieving mass customization (Fogliatto *et al.*, 2012). The literature on product modularity is quite extensive. However, the integrated view on product and service modularity approaches is under researched. The literature is also scarce on tools to analyze and determine the combinations of degrees of product and service modularities for configuring mass customization strategies. To fill this gap our objective is to develop a framework to assess configurations of the bundling of products and services through modularization strategies, and how such configurations become the foundations for mass customization strategies. Moreover, followed by Baldwin and Clark (1997) notion "*Strategies based on modularity are the best way to deal with that change*", we suggest a number of development paths in moving from one strategy to another and provide examples from different industries.

Design/methodology/approach

Our current study is exploratory as we seek to understand underlying principles that product and service modularity can contribute to devising mass customization strategies. We conducted an extensive literature review on product modularity, service modularity, and mass customization. From the literature on modularity we identified six critical characteristics that are relevant for both product and services: disagreggation, recombinability/reconfigurability, coupling, standardization, interfaces, and substitutability. Next, we derive a conceptual framework consisting of 12 dynamic mass customization strategies with paired product and service modularity. Case examples from different industries are provided not for theory-building, but to illustrate the usefulness of the framework.

Findings

As the market and competitive pressure change over time, firms might engage in different strategies to win the game of mass customization. The 12 mass customization strategies can help managers to identify the current strategic position of the company and how it might want to position itself in the future against the competition. We found that companies can reap the benefits of mass customization even if their products are non-modular. We also show that achieving full customization (product customization and service) might not provide firms with added competitive advantage.

Relevance/contribution

We contribute to the modularity literature by proposing a framework that combines measurement of product modularity and service modularity to determine mass customization strategies. Moreover, the framework can be useful for companies as a way to evaluate their combined product and service bundles in relation to competitors and/or as a planning tool to map their potential dynamics. In practice, the developed framework helps the managers to understand the possibilities for modularizing products and services as an integrated system. This is particular relevant for many industries that are facing structuring and configuration of their supply chains due to demand and supply challenges, such as those induced by internet-of things and servitization initiatives.

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