Chapter 3
Resource Implications of Manufacturer–Customer Interactions in Mass Customization

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ABSTRACT
This chapter explores the relationship between the capabilities of a manufacturing system and the participation of end-users in order determination. Using a simulated customer-direct mode for the customization of selected wood products, the authors examine manufacturing system attributes that enhance direct interaction with customers. The authors discuss strategic implications of the choice of customization-mode on fundamental resource requirements, and set out practical recommendations for deploying mass customization as a competitive strategy. End-user participation in configuring customized products requires that beyond desirable attributes such as agility in manufacturing systems, compelling service capability be developed to enhance customer experience.

INTRODUCTION
Given a specific mode of customization, an organization’s ability to engage customers in collaborative order determination is a function of the resources it possesses or develops (Brown and Bessant, 2003; Hart, 1995). The desired resources for mass customization include the capability to manage the increased levels of complexity associated with integrating individual customer preferences into product offerings in a cost-effective way (Mok et al, 2000). To enhance successful collaboration, market-driven organizations must also possess the capability for linking customers effectively (Day, 1994). Relative to a scenario where the order-determination process is moderated by retail channels, a manufacturing system that interfaces directly with the end-user may require a more comprehensive deployment of resources. However, though customization may be
offered through retailers (especially where product options may be selected and incorporated at the point of sale) retail-driven customization may not always be an attractive proposition from the standpoint of managing a manufacturer’s brand. The opportunity to leverage customers’ loyalty to a brand, and its implications for trust and long-term relationships, may provide sufficient basis for a manufacturer to consider direct collaboration with the customer (Berger et al, 2005). Thus, the complexity inherent in direct collaboration must be recognized and managed proactively through building the necessary capabilities.

In a study of a customer-direct offer of customized signage, Kubiak (1993) outlined how the iterative co-design process for determining and fulfilling customer preferences slowed down operations and increased costs as a company expanded its hitherto successful offering. The inability of the company to provide guidance for customers severely eroded earlier competitive gains; cross-training of employees needed to support the consultation for co-design was found to be lacking. We consider the proposition that specifying the key resource interactions that exist at the onset of the customization offer, can facilitate a more systematic translation of the essential mass customization principles in the growth phase of the business. From a resource development perspective, any competitive gains from an initial offer of customization could then be more easily retained as the company’s operations expand.

Resources and capabilities are critical considerations in formulating a strategy that might deliver a sustained competitive advantage to any company. The resource-based view of the firm essentially highlights the role of strategic resources and capabilities in driving economic value and sustainable competitive advantage (Barney, 1991; Conner 1991; Grant, 1991). Specific resources such as customer relationship networks, supplier relationship networks, reputation, market knowledge, materials management, and a competent manufacturing workforce are important considerations in resource development (Rangone, 1999). However, to contribute to a sustainable competitive advantage, these resources must also be harnessed in ways that differentiate how specific companies fulfill customer needs; incorporate features that are difficult to imitate; and have the potential to generate long-term benefits as the company exploits the associated advantages in the marketplace (Collis and Montgomery, 1995). For example, resources that are integrated with the knowledge-base of an organization may be considered to be significant contributors to competitive advantage because they cannot be easily imitated. This “knowledge-based view” of the firm expands the resource-based view by focusing on knowledge-based capabilities as an organization’s most critical resource for sustaining superior performance (Spender 1996; Grant 1996; Nonaka 1995; Kogut and Zander 1992). The literature also addresses the “relational view” of the firm and recognizes that a firm’s critical resources may be rooted in inter-firm relationships (Das and Teng, 2000; Afuah, 2000; Araujo et al., 1999; Dyer and Sing 1988). Macpherson et al (2004) suggest that the “relational elements of inter-firm transactions provide entrepreneurs with the opportunity to expand their organizational capabilities”. Thus, a firm’s critical resources may possibly be external to the firm itself. However, it is not our intention in this paper to address this extended resource-based view of the firm (Squire et al, 2006; Mathews, 2003). Neither do we specifically discuss the “relational view” nor the “knowledge based view” of the firm. Rather, we limit our scope to the resource interactions that are required for customization in a customer-direct mode at the firm level. The value in studying resource interactions within this limited scope lies in the fact that regardless of exogenous network factors, firms seeking to pursue mass customization in any form need to harness the contribution of specific capabilities within their manufacturing systems to be effective (Brown and Bessant, 2003). This study uses
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