

# Chapter VI

## Modular Organizations and Strategic Flexibility: The Mediating Role of Knowledge Management Strategy

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### ABSTRACT

*This chapter addresses the question of whether a modular organizational structure cultivates long-term proactive strategic flexibility. With the help of system dynamics modeling, our analysis suggests that a consistent organizational-learning supporting, personalization-oriented knowledge management strategy that encourages the creation of new knowledge through richer exchanges can be the enabler of strategic flexibility in modular organizations. The chapter emphasizes the mediating role of such a knowledge strategy and discusses three of its core elements, namely, boundary spanners and boundary objects, collaboration-supporting systems, and participative scenario planning, as practices and systems, which under a common umbrella, can contribute towards achieving real strategic flexibility in modular organizations.*

## INTRODUCTION

Although the relationship between organizational modularity, the flexibility of the product development process, and the resulting simplified knowledge management and decision-making processes has been investigated quite extensively (Hayes & Pisano, 1994; Sanchez, 2002; Sanchez & Collins, 2001; Sanchez & Mahoney, 1996; Simon, 2003; Slack, 1983), the relation of organizational modularity to corporate-level strategic flexibility and the mediating role of learning and knowledge management strategy have not been discussed under a holistic, consistent, and dynamic perspective. This chapter aims at doing so by investigating whether, and under which conditions, modularity can contribute to gaining sustainable competitive advantage in turbulent environments through strategic flexibility. Based on insights from cognitive science and the theory of the learning organization, we argue that the strategic benefits of modularity with respect to strategic flexibility can be seized repeatedly only when there are appropriate long-term cross-module learning and knowledge management practices and systems in place.

So far, many authors (e.g., Nadler & Tushman, 1999; Sanchez & Heene, 2004; Worren, Moore, & Cardona, 2002) have stressed the position that product and organization modularity result in augmenting the strategic flexibility of organizations and their chances of sustaining their competitive advantage. According to this stream of logic, modular products lead to modular organizations (Sanchez & Mahoney, 1996) as the different organizational units involved in the design process of products with interchangeable components are loosely coupled, operate autonomously, and can be easily reconfigured to provide rapidly changing technologies and products that markets want. Furthermore, generalizing the product development process to all organizational activities, it is argued that loosely coupled organizational forms allow organizational components, such as a contract

manufacturer, an ally firm, or a new department, and their corresponding resources to be flexibly integrated and/or recombined for forming a wide range of different configurations (Helfat & Eisenhardt, 2004; Karim, 2006; Schilling & Steensma, 2001). As a consequence, strategic flexibility is being increased as organizational knowledge is managed in a way that facilitates specific forms of “coordinated self-organizing processes” (Sanchez & Mahoney, 1996). This means that in modular organizations, coordination tasks are delegated to individual modules (functions, teams, etc.) and organizational coherence and strategic alignment are easily achieved through fully specified interfaces and standardized reconfiguration procedures, which are the result of the codification of the specific knowledge that exists inside and across modules (Sanchez, 2002). In addition to reducing managerial complexity and simplifying the flows of knowledge and information, this structural, hierarchical function-based decomposition results in the localization of the impacts of environmental disturbances within specific modules, thereby increasing the immunity and adaptability of the organization (Sanchez & Mahoney, 1996; Schilling, 2000).

Nevertheless, a fundamental question that arises from the operational characteristics of modular organizations with respect to the sustainability of competitive advantage is whether this organizational form can be self-sustained by internally fostering forces that catalyze the generating core of strategic flexibility, that is, whether this particular organizational structure breeds mechanisms that proactively cultivate strategic—not operational—flexibility. In the rest of this chapter, we examine this question from the perspective of the cognitive and learning schools of strategic management. With the aid of system dynamics modeling and simulation, we explore the long-term dynamics of the relationship between modularity and strategic flexibility, and examine the mediating role of knowledge strategy. Based on the assumption that in the cognitive perspec-

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