



The antecedents of supply chain agility of a firm: Scale development and model testing

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Abstract

In a constantly changing global competitive environment, an organization's supply chain agility directly impacts its ability to produce, and deliver innovative products to their customers in a timely and cost effective manner. While the beneficial impact of supply chain agility is generally acknowledged, very little research exists to date addressing how an organization can achieve supply chain agility. This study first presents a framework of an organization's supply chain process flexibilities as an important antecedent of its supply chain agility, and then establishes the key factors that determine the flexibility attributes of the three critical processes of the supply chain—procurement/sourcing, manufacturing, and distribution/logistics. Using empirical data, we develop flexibility and agility scales related to our supply chain agility model, and then test the model. Findings reveal that supply chain agility of a firm is directly and positively impacted by the degree of flexibility present in the manufacturing and procurement/sourcing processes of the supply chain; while it is indirectly impacted by the level of flexibility within its distribution/logistics process. The results also support our view that a firm's supply chain agility is impacted by the synergy among the three process flexibilities in its internal supply chain.

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1. Introduction

Organizations typically compete along several competitive dimensions, such as cost, quality, delivery, flexibility, etc. (Wheelwright, 1984). However, today's hyper-competitive environment is characterized by constant change and market unpredictability (Brown

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and Eisenhardt, 1998). Complex technological advances, shortened product life cycles, diverse customer requirements, and increased demand for product variety in fragmented global markets have drastically shortened market visibility and increased uncertainty. Given these pervasive changes, successful organizations have to remain competitive while adapting to changing marketplace conditions (Brown and Eisenhardt, 1998). Since, “agility is all about customer responsiveness and mastering market turbulence” (van Hoek et al., 2001), agility is regarded as a necessary ingredient for improving competitiveness (Yusef et al., 1999).

While flexibility, particularly manufacturing flexibility has been well researched (e.g., Slack, 1983, 1987; Gerwin, 1987, 1993; Upton, 1994; Vokurka and O’Leary-Kelly, 2000; Koste and Malhotra, 2000); agility has received far less attention in the literature. However, some studies have attempted to provide a conceptual definition of organizational agility. Sharifi and Zhang (1999) define it as, “the ability to cope with unexpected challenges, to survive unprecedented threats of business environment, and to take advantage of changes as opportunities”, whereas Goldman et al. (1994) describe an agile organization as, “dynamic and having the potential to achieve a competitive advantage To be dynamic, an organization’s competitive strategy focuses on knowledge development and flexible processes that enable it to respond to these changing circumstances”. A more recent and comprehensive definition of organizational agility is provided by Kidd (2000):

“An agile enterprise is a fast moving, adaptable and robust business. It is capable of rapid adaptation in response to unexpected and unpredicted changes and events, market opportunities, and customer requirements. Such a business is founded on processes and structures that facilitate speed, adaptation and robustness and that deliver a coordinated enterprise that is capable of achieving competitive performance in a highly dynamic and unpredictable business environment that is unsuited to current enterprise practices”.

These definitions and interpretations clearly indicate that organizational agility is a very broad and multi-dimensional concept, and involves several diverse aspects of an organization. For example, Goldman et al. (1994) lists nine elements of

organizational agility, such as customer dialogue and support, continuous improvement and change, people support, and flexible and rapidly responding operations. Since organizational agility involves many diverse issues, this paper focuses on identifying the determinants of agility in an organization’s *supply chain*. Clearly, possessing agility in the supply chain enables a manufacturing firm to achieve higher levels of overall organizational agility. Supply chain agility enables an organization to react quickly and more effectively to marketplace volatility and other uncertainties, thereby allowing the firm to establish a superior competitive position. In addition, firms with agile supply chain processes are more market sensitive, better capable of synchronizing supply with demand, and able to achieve shorter cycle times. Given that an organization’s supply chain agility directly impacts its ability to produce innovative products and deliver them to their customers, we believe an organization’s supply chain agility is a critical factor affecting its overall global competitiveness.

While the benefits of supply chain agility are generally acknowledged, little research exists which addresses how an organization can achieve supply chain agility. For example, virtually no research exists that empirically or analytically explores antecedents of supply chain agility. This research addresses this gap by undertaking an empirically driven study to identify and develop critical factors that determine and influence an organization’s supply chain agility. To achieve this goal, we develop a process-based framework of an organization’s supply chain agility. This framework establishes key factors that determine flexibility attributes of three critical processes of the supply chain in a firm—procurement/sourcing, manufacturing, and distribution/logistics—as well as factors that constitute the antecedents of its supply chain agility.

In the next section, we first present the theoretical development of our supply chain agility framework, as well as develop the constructs and hypotheses within this framework. We then present the psychometric development of the constructs, followed by structural equation modeling analysis of the model, and discussion of the ensuing results. We conclude with a discussion of the managerial and research implications of our results, and provide suggestions for future research.

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