



Improving the execution of supply chain management in organizations

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ABSTRACT

The aim of this paper is to identify areas for improving the level of supply chain management (SCM) execution. A conceptual model was developed that proposes internal and joint SCM conditions and the adoption of SCM processes as the main antecedents of SCM execution. Based on a survey of 174 senior managers representing large organizations structural equation modeling was conducted followed by a three-step importance-performance analysis. The results show that internal SCM conditions, specifically information technology and human resources, are the major drivers for improving the total level of SCM execution.

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1. Introduction

Kaihara (2001) has recognized supply chain management (SCM) as one of the best means to improve the performance of organizations. SCM is defined by Villa (2001) as the management of different types of physical, information and financial flows from the stage of raw material through to a final product where material suppliers, manufacturers, distributors and customers are connected. This complements the definition provided by the Council of Supply Chain Management Professionals (see www.cscmp.org). By being able to manage inbound supply and outbound distribution effectively, organizations gain competitive advantages as operations are processed faster, more flexibly and at less cost (Al-Mudimigh et al., 2004). This ability requires organizations to integrate SCM within their internal boundaries. Olhager and Selldin (2004) examined how Swedish organizations deal with specific supply chain issues while Kim (2007) analyzed different organizational set-ups and how these affect the performance of SCM. These investigations focused on the level of supply chain integration and subsequent SCM performance across different organization types.

However, to our knowledge the question of how much SCM an organization has undertaken and what drives this level of SCM execution have not been examined sufficiently. Kotzab et al. (2006a, b) conducted some exploratory work by analyzing a

sample of Danish organizations. Building on these preliminary findings, the aims of this paper are twofold: (1) identify the antecedents of SCM execution and (2) establish an analysis procedure that allows for prioritizing the identified antecedents with respect to their existing performance.

For this purpose we first set up a conceptual model based on theory and literature that proposes certain antecedents of SCM execution. This model can be used to measure the level of SCM execution within organizations. Subsequently, we develop and apply a three-step importance-performance analysis approach (IPA) to demonstrate how the level of SCM execution within organizations may be increased. We then conclude the paper with a discussion and outlook section.

2. A model of SCM execution within organizations

The adoption and execution of SCM has been theorized by Bechtel and Jayaram (1997), Chen and Paulraj (2004), Cooper et al. (1997) or Mentzer et al. (2001), but there has been little empirical testing. The primary empirical studies include Cigolini et al. (2004), Fawcett and Magnan (2001), Kotzab et al. (2006a, b) and Wisner (2003). Following these authors, we have developed and empirically tested herein the following SCM adoption and execution framework, which consists of four major elements: (1) internal SCM conditions (ξ_1), (2) joint SCM conditions (ξ_2), (3) adoption of SCM-related processes (ξ_3) and (4) the execution of SCM within organizations (η_1) (see Appendix and Fig. 1).

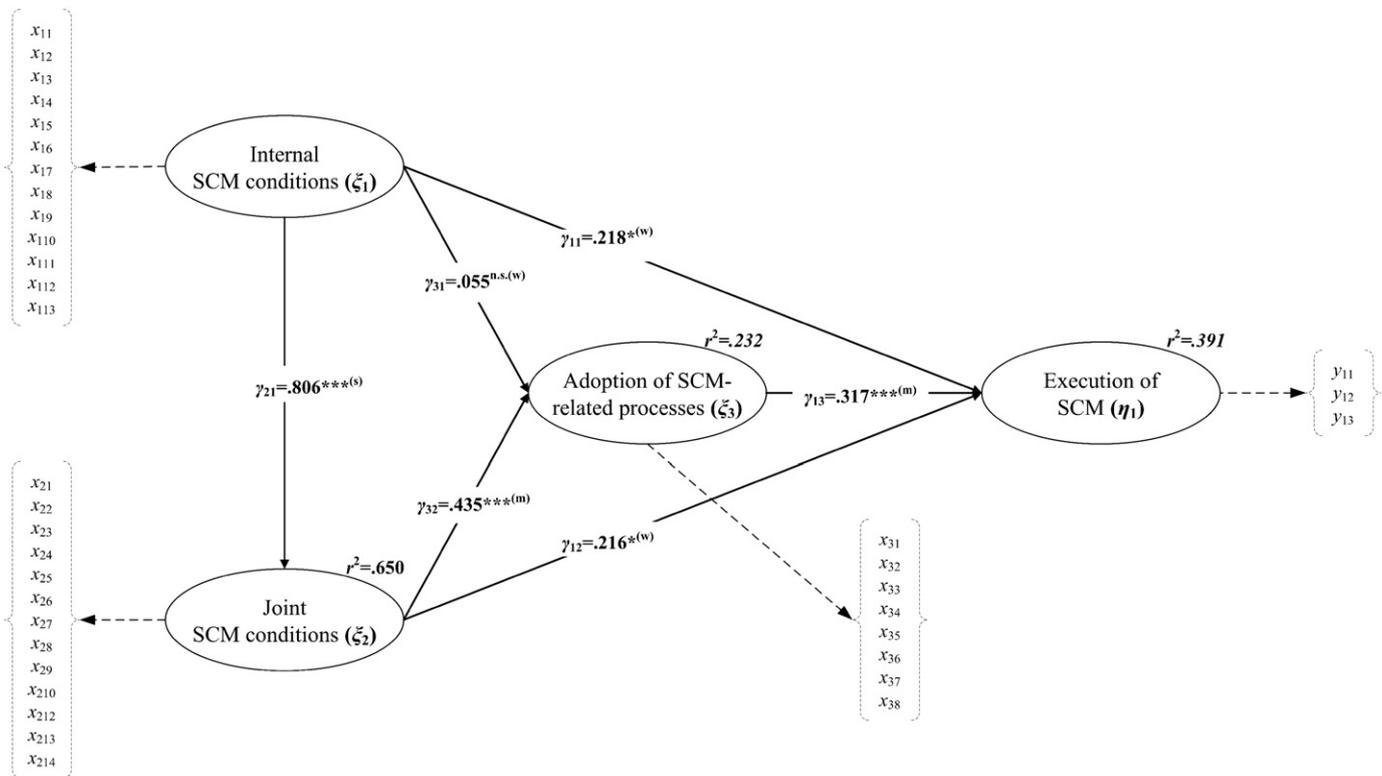
The 'execution of SCM within organizations' is understood as a firm's internal and external integration of business processes with suppliers and customers in order to create value and to improve

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Caption: ξ_n, η_n , factors/constructs; γ_n , proposed effects; x_n, y_n , indicators behind factors; effect size (see f^2 -values): w, weak effect, m, moderate effect; s, strong effect; *, t-values are significant ($p < .05$); **, t-values are significant ($p < .01$); ***, t-values are significant ($p < .001$); n.s., t-values are not significant ($p > .05$); **Notions:** Sample size $n = 174$; t-values calculated by applying a bootstrapping procedure with 1,000 sub-samples (Chin, 1998); f^2 -values: $f^2(\gamma_{21}) > .35$; $f^2(\gamma_{31}) = .004$; $f^2(\gamma_{32}) = .088$; $f^2(\gamma_{11}) = .027$; $f^2(\gamma_{12}) = .025$; $f^2(\gamma_{13}) = .123$;

Fig. 1. Conceptual model and modeling results.

the total performance of the chain (Cooper et al., 1997; Lambert et al., 1998). The level of the 'execution of SCM within organizations' though depends on the level of utilizing these processes internally within the organization and externally with suppliers and customers.

Therefore this element depends on 'SCM-related processes' which defined those practices that integrate or coordinate different key business areas within the firm and between a firm's suppliers and customers (Lambert et al., 1998). 'SCM-related processes' generate a flow of products, services and related information and create value for customers as well as improving the total performance of the chain (Al-Mudimigh et al., 2004; Fawcett and Magnan, 2001) and can be subdivided into eight areas (Cooper et al., 1997; Croxton et al., 2001; Lambert et al., 2005): (1) customer relationship management, (2) customer service management, (3) demand management, (4) order fulfillment, (5) manufacturing flow management, (6) supplier relationship management, (7) product development and commercialization and (8) returns management. 'SCM-related processes' include the dimensions of the customer, product flows and information flows and the direction of the flows is both downstream (forward to the customer) and upstream (backwards towards the supplier).

In order to generate or adopt these processes and consequently undertake SCM, fundamental requirements which we call 'SCM conditions' must exist within the organization and between participating parties (Mentzer et al., 2001). 'SCM conditions' can therefore be split into 'internal' and 'joint SCM conditions' (Kotzab et al., 2006a). 'Internal SCM conditions' are fundamental for originating SCM-related processes and the execution of SCM within the organization. They refer to commitment and dedication of human and financial resources, top

management support, internal visions and goals, the staff's technical expertise, internal IT-systems, guidelines for information exchange, education, the establishment of internal project groups and processes as well as integration behavior (Bechtel and Jayaram, 1997; Chen and Paulraj, 2004; Cooper et al., 1997; Mentzer et al., 2001; Cigolini et al., 2004; Fawcett and Magnan, 2001; Lambert et al., 2005). As Childerhouse et al. (2004), Lambert (2004) or Lambert and Knemeyer (2004) have argued, some 'homework' has to be done internally before concentrating on an external integration of business processes with suppliers and/or customers. Therefore the construct of organizational behavior as one strategic component of SCM, including variables of culture, power and human resources were included as these prerequisites are needed to connect organizations within a network (Mentzer et al., 2001).

'Joint SCM conditions' are then the fundamental requirements that originate 'SCM-related processes' and the execution of SCM between organizations. They include shared performance measurement, planning and controlling systems, shared vision and goals, organizational structure, joint project groups, systems perspective, trust, long-term-oriented relationships, power, shared profits and risks, mutual dependency, shared information on inventory status, shared information on forecasts, shared information on product development, organizational culture and equivalent management methods (Chen and Paulraj, 2004; Mentzer et al., 2001; Lambert et al., 1998).

Based on the foregoing, our model proposes that the execution of SCM is directly affected by the adoption of SCM-related processes (γ_{13} , Cousins and Menguc, 2006), and by joint SCM conditions (γ_{12} , Lambert et al., 2005) and internal SCM conditions (γ_{11} , Mentzer et al., 2001). We further propose that internal SCM

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