

Chapter 5

Modeling Enablers of Flexible Supply Networks Using Total Interpretive Structural Modeling

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ABSTRACT

The chapter aims to identify the contextual interrelationships among flexible supply network enablers for achieving supply chain sustainability. The authors have identified the enablers through a review of extant literature and further applied the popular total interpretive structural modeling (TISM)-based methodology. TISM is a well-articulated mental model interpreting both the nodes (indicating “what”) and links (indicating “how” and “why”). The mental model of the group is not well structured and is loosely defined, which serves as the basis for the theory building process. The authors finally obtained a hierarchy of enablers and findings show that innovation culture is the driving element in developing flexible systems in supplier networks. Supply chain practitioners must focus on developing an innovation culture within the boundaries of the organization and then integrate with specialist suppliers to ultimately build additional capacity for managing the fluctuations in customer demand and further manage supply risks. The chapter ends with conclusions drawn from study and directions for future research studies.

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INTRODUCTION

Supply management is critical to success for supply chain performance (Chen et al., 2004). Recently, supply chain practitioners have started realizing the importance of flexibility in purchasing and supply management and started exploring this field in-depth (Mangla et al., 2014; Kaur et al., 2016). The recognition of the importance of flexibility is due to the high level of uncertainty, cut throat competition and increasing demands of global customers which has forced manufacturers to adopt flexible systems for achieving long term sustainability (Singh & Acharya, 2013; Mangla et al., 2015; Gunasekaran et al., 2016). The concept of flexibility in supply chain and operations management has been lifted to a higher path by Sushil with his stream of research (Sushil, 1997, 2000, 2001; Sharma & Sushil, 2002; Palanisamy & Sushil, 2003; Sushil, 2005).

Apart from adopting flexibility mechanisms, it is also essential for organizations to consider long term sustainability while configuring their supply networks. Bag and Anand (2015) has provided an updated literature review on sustainable supply chain network design. Sustainable supply chain network design leads to resource savings, energy conservation, waste elimination and productivity improvement. Therefore, sustainable practices can directly improve environmental performance and indirectly improve the business performance by creating a major competitive advantage in entire supply chain network. Integrating flexibility and sustainability in procurement management function results into superior firm performance (Bag & Gupta, 2017). Vendor selection and development is an important decision-making part under flexible systems which require considerable buyer skill and expertise. In traditional procurement practices pricing terms was considered as the main criteria whereas in flexible and sustainable supply chain practices there are factors beyond price that are considered for decision making. These days buying firms consider supplier financial capability, strategic alignment, the speed of design and manufacturing capacity for selecting sustainable suppliers. This help in mitigating risks in the supply chain network (Dubey et al., 2013a). Suppliers with environmental certification such as ISO 14000 are preferred more for lesser environmental risks (Madaan & Wadha, 2007). However, flexible, sustainable supply practices are possible through the development of strong ties between the buying and supplier firms (Dubey & Bag, 2013). Supplier relationship and waste reduction through supplier collaboration were found to be positive determinants of business performance (Dubey et al., 2013b). Therefore, firms must focus on collaboration, cooperation and coordination for enhanced flexibility and achieve sustainability objectives (Bag, 2016).

Traditional procurement systems can no longer succeed in this modern business era. Nowadays manufacturers purchase material from suppliers located at different corners of the world within the shortest possible lead times. Developing suppliers

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