

Chapter 69

Risk and Visibility in Supply Chains: An Information Management Perspective

Dario Messina

University of Porto, Portugal & INESC TEC, Portugal

Cláudio Santos

INESC TEC, Portugal

António Lucas Soares

University of Porto, Portugal & INESC TEC, Portugal

Ana Cristina Barros

INESC TEC, Portugal

ABSTRACT

The emergence of complex supply chains is one of the most important consequences of globalization. The management of these supply chains requires increased efforts by organizations that, on one hand, are increasingly pressured by customers in terms of service levels, on the other hand, must manage their suppliers from various locations and with different local requirements. In this context, an appropriate management of information flows is needed to create the adequate visibility level for managing supply chain risk. This chapter presents an overview on the concepts of risk management, visibility and information management in supply chains. This study proposes a conceptual framework for the selection of risk mitigation strategies in the supply chain and characterizes the external and internal information flows decision makers need to implement two categories of risk mitigation strategies: redundancy and flexibility.

INTRODUCTION

Companies nowadays value the importance of establishing a risk management process to identify, measure, mitigate, and control risks in their supply network (Elmsalmi & Hachicha, 2014). In order to be able to identify these risks, companies are starting to work with their network partners towards creating supply network visibility (Nooraie & Parast, 2015). By sharing what sometimes is sensitive and proprietary

DOI: 10.4018/978-1-5225-5481-3.ch069

information with their network partners, companies aim at aligning their common objectives through ensuring the efficient management of the whole chain. Still, there is a need to create visibility over the specific information that will enable companies to identify and act upon the risks and opportunities of their supply network. In fact, in the global and digital context in which firms operate, information assumes a distinctive role, as it supports effective decision-making process.

Supply chains are networks of partners globally dispersed, delivering complex products and services. Today, there is a shift from verticalization of operations in the supply chain to the integration and closer management of the relationships among key partners of the supply chain (Harland, Brenchley & Walker, 2003; Figueiredo, Silveira & Sbragia, 2008; Thun & Hoenig, 2011; Lavastre, Gunasekaran & Spalanzani, 2012; Messina, Santos, Barros & Matopoulos, 2015). All these characteristics may cause uncertainty and disruption along the chain, so there is a clear need to establish risk management processes in the supply chain (Elmsalmi & Hachicha, 2014). Despite the recognized relevance of risk management in supply chains, more research is needed to identify how firms act to mitigate these risks (Bode, Wagner, Petersen & Ellram 2011; Son & Orchard, 2013). Existent literature in supply chain risk management has focused on identifying the different causes of supply chain disruption (Christopher & Peck, 2004; Wagner & Bode, 2008) and implications of supply chain risk management in terms of supply chain performance (Wagner & Bode, 2006; Wagner & Bode, 2008). Still, few researchers have focused in examining how different mitigation strategies can be adopted in different risk scenarios (Ghadge, Dani & Kalawsky, 2012).

The implementation of the risk mitigation strategies require the coordination of the flows of material, information and financial resources, and therefore it is essential to increase the visibility along the supply chain (Goswami, Ravichandran, Teo & Krcmar, 2011; Koçoğlu, İmamoğlu, İnce & Keskin, 2011; Goswami, Engel & Krcmar, 2013). However, the concept of supply chain visibility has till now been associated with information exchange only among supply chain partners (Lamming, Caldwell, Harrison & Phillips, 2001; Swaminathan & Tayur, 2003; Caridi, Crippa, Perego, Sianesi & Tumino, 2010; Nooraie & Parast, 2015). Our research shows, that for the implementation of risk mitigation strategies along the supply chain in complex environments the use of internal information has to be complemented with the analysis of information from outside the supply chain. Consequently, the goal of this chapter is to propose a conceptual framework that characterizes the external and internal information flows decision makers need to implement two categories of risk mitigation strategies: redundancy and flexibility.

The chapter is divided in six sections. The next three sections outline the theoretical foundations of the chapter synthesizing the evolution and characteristics of supply chain risk management, supply chain visibility, and information management. Then a conceptual framework is presented based on the literature that identifies and exemplifies the information needed to implement two risk mitigation strategies, namely redundancy and flexibility. Finally, the last two sections suggest potential paths for future research and discuss the implications for researchers and practitioners of the proposed conceptual framework.

SUPPLY CHAIN RISK MANAGEMENT

Definition of Risk

The origin of the word “risk” derives from the ancient Italian *risicare*, which means to dare (Bernstein, 1996). Its meaning has changed over time according to the perception that different people have of the

22 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage:

www.igi-global.com/chapter/risk-and-visibility-in-supply-chains/202282

Related Content

Assessment of Clinical Decision Support Systems for Predicting Coronary Heart Disease

Sidahmed Mokeddemand Baghdad Atmani (2016). *International Journal of Operations Research and Information Systems* (pp. 57-73).

www.irma-international.org/article/assessment-of-clinical-decision-support-systems-for-predicting-coronary-heart-disease/153911

Application of Soft Systems Methodology to the Real-World Processes of Human Resource Management

(2021). *Applications of Soft Systems Methodology for Organizational Change* (pp. 170-188).

www.irma-international.org/chapter/application-of-soft-systems-methodology-to-the-real-world-processes-of-human-resource-management/259199

Non-Parametric Estimation of Environmental Efficiency Using Data Envelopment Analysis and Free Disposable Hull

Richard Mulwa (2014). *Handbook of Research on Strategic Performance Management and Measurement Using Data Envelopment Analysis* (pp. 437-466).

www.irma-international.org/chapter/non-parametric-estimation-of-environmental-efficiency-using-data-envelopment-analysis-and-free-disposable-hull/121499

Software Estimation Framework for Digital Enhancements and Maintenance Projects

Shailesh Kumar Shivakumar (2020). *International Journal of Project Management and Productivity Assessment* (pp. 81-96).

www.irma-international.org/article/software-estimation-framework-for-digital-enhancements-and-maintenance-projects/256512

How to Implement Multidisciplinary Work Processes in the Oil Industry: A Statoil Case

Tom Rosendahl, Asbjørn Egirand Erik Rolland (2013). *Integrated Operations in the Oil and Gas Industry: Sustainability and Capability Development* (pp. 155-170).

www.irma-international.org/chapter/implement-multidisciplinary-work-processes-oil/68715