Chapter 8

The Role of Information Sharing in the Supply Chain From Maquiladoras in Northern Mexico

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ABSTRACT

In this chapter a structural equation model is presented to quantify the effect of four independent variables: Information sharing, Collaboration with suppliers, Employee performance, and Supply chain performance, which are related through six hypotheses and validated with the partial least square technique in the WarpPls 6.0 software. The model is validated with data from 254 surveys obtained in the manufacturing industry in Mexico. Similarly, a sensitivity analysis is reported for each of the proposed hypotheses. The results indicate that the most relevant variable in the supply chain performance is the appropriate employee performance.

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INTRODUCTION

Precise and reliable information is needed to support the decision process (Mitchell & Kovach, 2016). Due to the large number of participants in supply chain (SC) operations, several organizations often find it difficult to share information effectively within the supply chain (Mitchell & Kovach, 2016), since over two decades on the SC management research experts have tried to identify better ways to use information more effectively, in order to improve coordination and performance.

For Raweewan and Ferrell (2018) “Collaboration is an increasingly essential concept in the SC, because experts have found that, in some situations, working together will provide benefits that so far exceed risks.” Therefore, a number of some type of relationships have been tested in different application domains with several degrees of success; however, the common thread among all of them is the fundamental idea of sharing “knowledge” (Raweewan & Ferrell, 2018). In that sense, the SC collaboration (SCC) may assume two different types of relationships: (1) vertical, which is between a supplier and a customer and (2) horizontal, that is between companies on the same SC, including competitors as well (Raweewan & Ferrell, 2018). Consequently, it is crucial to share information with the collaborators throughout the supply chain. The information sharing improves the SC agility and visibility, and therefore it positively impacts on the SC stability (Mitchell & Kovach, 2016). For instance, the availability of real-time forecast information, data demand, and shipment progress through adapted information communications technology applications, increase the SC flexibility and capacity (Ye & Wang, 2013).

A specific example about their integration is in the USA-Mexican border, where SC firms are needed, since in this type of zone there are interesting logistics structures (Chung, Talluri, & Kovács, 2018). Traditionally, these companies are called Maquiladoras and as any manufacturing firm, the importance of a SC integration is well known, due to importation and exportation tasks (Chung et al., 2018), therefore, several maquiladoras strive to practice just-in-time (JIT) operations in order to low their production costs (Lawrence & Hottenstein, 1995). Also, these types of maquiladoras import raw materials from other countries, as well as export finished products, which requires a high suppliers and manufacturers integration, information sharing, and specialized human resources.

Since signing the North American Free Trade Agreement (NAFTA) an increasing number of American companies have organized their production systems with material and component supply flows from their subsidiaries located in Mexico or Canada. As a result, supply chains interact more within the NAFTA area. Since there are more interfaces, supply chains are also more dispersed between the three countries. Under NAFTA, the value of trade between USA and Mexico by all means of transportation increased by $364 billion from 1995 to 2011 Cedillo-Campos, Sánchez-Ramírez, Vadali, Villa, and Menezes (2014),

Likewise, Free Trade Zones in Mexico along the United States (US)- Mexico border have been one of the most indispensable manufacturing bases for the US market for decades (Chung et al., 2018). Currently, there are 5120 Manufacturing Industries in Mexico, where Ciudad Juarez is the second city with more industries related to these nationwide maquiladoras with a total of 331 companies. Specially, in December 2018, the maquiladora sector in Ciudad Juarez had a total of 296,877 jobs, which indicates the importance of human factors in this specific supply chain.

From other point of view, the total gross domestic product (GDP) in the Chihuahua State (Mexico), the manufacturing industry contributes 27%, only exceeded by the services sector (Financial services, health, education, real estate, among others), contributing with 4% of GDP at a national level. Also,