

Chapter 19

A TQM–Based Multi– Dimensional Approach to Improve the Quality of Supplier Selection in the Retail Industry

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ABSTRACT

In this chapter, the authors study risks in supply chain management, in the process of supplier selection for the procurement department of a retail supply chain. They propose a TQM-based multi-dimensional approach to improve supplier quality. They discover how the potential risks influence the performance of procurement in the supplier selection process of supplier relationship management. This chapter introduces a current supplier assessment approach by using weighted score ranking method as a single dimension mechanism for supplier selection in a specific retail industry. To estimate the efficiency of this mechanism, they use principal component analysis (PCA) statistical approach on real datasets to identify the most important factors that influence the decision-making of supplier selection. The strengths and weaknesses of this single dimension weighted ranking method are analyzed. The authors propose a total quality management (TQM)-based multi-dimensional mechanism to help the buyer identify, avoid, monitor, and reduce potential risks instead of using linear weighted score ranking method.

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1. INTRODUCTION

In the past several years, the topic of supply chain risk management has been researched and discussed in the inner circles of operations professionals, business management references etc. According to definition of SCOR risk management mode, “Supply chain risk management is the systematic identification, assessment, and quantification of potential supply chain disruptions with the objective to control exposure to risk or to reduce its negative impact on supply chain performance (SCOR, 2007).” In SCOR 8.0 mode, it is said that “Potential disruptions can either occur within the supply chain (e.g. insufficient quality, unreliable suppliers, machine break-down, uncertain demand etc.) or outside the supply chain (e.g. flooding, terrorism, labor strikes, natural disasters, large variability in demand etc.).” Also, “Management of risk includes the development of continuous strategies designed to control, mitigate, reduce or eliminate risk.” Therefore, contents of SCOR risk management model include identifying risk, designing detection measures, controlling risks exposure, eliminating risks etc. In the literature of Wagner and Bode (2006), it is easy to distinguish such terms:

- *Supply chain risk*: It is defined as the negative deviation from the expected value of a certain performance measure, resulting in negative consequences for the focal firm. Hence, risks are equated with the detriments of a supply chain disruption.
- *Supply chain disruption*: A supply chain disruption is an unintended, untoward situation that leads to supply chain risk. For the affected firms, it is an exceptional and anomalous situation in comparison to every-day business. Supply chain disruptions can materialize from various areas, internal and external to supply chain.
- *Supply chain risk source*: It attempts to circumscribe supply chain disruptions (i.e. the demarcation of supply chain risks from other business risk). Many scholars have proposed classifications in the form of typologies or taxonomies of risks. The derived classes of supply chain disruptions are often labeled as supply chain risk sources.
- *Supply chain vulnerability*: While a supply chain disruption is the situation that leads to the occurrence of risk, it is not the sole determinant of the final result. It seems consequential that susceptibility of the supply chain to the harm of this situation is also of significant relevance. This leads to the concept of supply chain vulnerability. In other words, Christopher and Peck (2004) defined supply chain vulnerability as “an exposure to serious disturbance”, while Barnes and Oloruntoba (2005) described vulnerability as “a susceptibility or predisposition to loss because of existing organizational or functional practices or conditions”.

Hence, to sum up, supply chain risk management can be described as the process of managing the supply chain risks through coordination or collaboration among the supply chain partners, so as to avoid business failures and ensure profitability and continuity. Thus, the aim of risk management is to plan management strategy, detect risks, control failures, monitor the process of implementing risk management, audit and evaluate the results. All the countermeasures serve to safeguard continuity and maximize profitability (Tang, 2005). Additionally, the mechanism to deal with procurement risk management is often created through the agreement between buyers and suppliers with the purpose to avoid the damage caused by buyer uncertainty, system malfunction, buyer or supplier error, and product or service mismatch (Tang and Shee et al., 2001).

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