MULTIPLE CRITERIA FRAMEWORK FOR THE SUSTAINABILITY RISK ASSESSMENT OF A SUPPLIER PORTFOLIO

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ABSTRACT

In this study, we developed a decision making model that aligns sustainability goals with the corporate goals from the perspective of the purchasing function. Our Supply Sustainability Risk Assessment Framework (SSRAF) quantifies the potential risks to the sustainability of the supply chain for different supplier segments. The supplier segments are represented through a 2x4 matrix (8 quadrants) with the cost of products on the x-axis (Low/High), supply risk on the y-axis (Low/High) and sustainability impact on the z-axis (Low/High). We assess sustainability risk for four supplier segments representing a High impact on sustainability and allow the evaluation of economic, environmental and social risks internal and external to the supplier permitting the integration of multiple stakeholders. The framework simplifies the cognitive effort of decision makers when selecting a portfolio of suppliers. It provides an assessment of the level of hazardousness, vulnerability and implementation of risk management practices relevant to each supplier segment and enables long-term partnerships by the consideration of risk monitoring and mitigation when necessary. The SSRAF was applied to real data collected from a global manufacturer of consumer products with operations in Mexico.

KEY WORDS: Supplier selection, Supplier Development, Risk Assessment, Sustainability, Multi-criteria decision making, Purchasing

1. INTRODUCTION

Sustainable procurement means “making sure that the products and services an organization buys achieve value for money and generate benefits not only for the organization, but also for the planet” (ICLEI-Europe, 2015). Companies excelling at sustainable procurement strive to ensure that their products meet or exceed environmental and social expectations while, at the same time, their actions contribute to grow revenues, reduce costs, manage risks and build intangible assets (Bush, 2008). Among the reasons why companies are interested in estimating the sustainability performance of their supply network are an increasing exposure to climate change, increasing accountability of businesses and new perceived business benefits. In face of these challenges, procurement managers require to respond with realistic models and approaches to decision making that promote an expanded view of risks and a wide implementation of sustainability practices.

The ability to express sustainability benefits in quantitative terms is a key driver necessary to instill sustainability into procurement business models. For this, the procurement function needs to consider the different dimensions of sustainability and integrate stakeholder opinion in order to achieve the alignment with sustainable competitive priorities. Although the integration of sustainability criteria in supply chain analysis in general has seen a growing interest in the last two decades, most of the academic papers on the topic have focused on the qualitative side with very few dedicated to build quantitative models (Genovese et al., 2013; Govindan et al., 2015; Seuring, 2013). Moreover, while most studies have paid attention to the multiple criteria aspect of sustainability, little consideration has been given to its dynamic nature. This implies a greater emphasis on the evaluation of short-term supplier performance during supplier evaluation and selection processes and, fundamentally, no attention to the assessment of the supplier capabilities, collaboration and development practices (Arroyo-López et al., 2012), that support sustainable performance and are linked to supplier risk management (Agan et al., 2014; Seuring and Muller, 2008).

Risk management is one of the most significant challenges faced by nearly every supply chain in the 21st century. As information and communication technologies have revolutionized the availability and exchange of information, global competition has allowed companies to offer increased product variety and even the outsourcing of core operational activities as manufacturing. These initiatives make supply chains more vulnerable to disruptions caused by multiple factors, such as uncertain economic cycles, consumer demands, and natural and man-made disasters. In
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