

Supply Chain Risk Management

Subjects: Business

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Supply chain risk management is an integral function of the supply network. It faces unpredictable challenges due to nations' economic policies and globalization, which have raised uncertainty and challenges for supply chain organizations. These significantly affect the financial performance of the organizations and the economy of a nation.

Keywords: risk management,outsourcing risk,risk sharing,process management,supply chain disruptions

1. Introduction

International trade leads to global supply chains, and risks are inherent in supply chain management (SCM). Globalization and trade openness have amplified the vulnerability in SCM and increased the risks. The monetary value of supply chain expenses is the highest in manufacturing organizations^[1]. Nonetheless, SCM risks are assumed to be non-financial risks in the traditional sense of risk in the finance and insurance industries.

Risk management refers to the implementation of strategies and plans to manage supply chain networks through constant risk assessment and reduce vulnerabilities to ensure resilience in supply chains. All supply chains do not have the same risks, but some risks are common. The risks are also specific to an area of business or the field of study^[2]. A supply chain is as strong as the most vulnerable member of the supply chain. Therefore, the longer a supply chain, the greater the risk of failure of the supply chain. Supply chains have many players. A high number of players present risks^[3]. However, building a robust supply chain is expensive^[4]. Numerous research articles have suggested the need for such supply chains due to the magnitude of the adverse effects of risk on its performance^{[5][6][7][1]}.

Supply chain risk management (SCRM) is a systematic and phased approach for recognizing, evaluating, ranking, mitigating, and monitoring potential disruptions in supply chains^[8]. SCRM is an important area due to an incident's cascading effects on logistics networks^[9]. Some examples of such events include September 11, the Gulf War, the outbreak of a pandemic (e.g., bovine spongiform encephalopathy, and coronavirus disease 2019, COVID-19), the millennium bug. These disruptive events have compelled practitioners to explore the vulnerabilities in supply chains and evaluate risks. Vulnerabilities in a supply chain depend on the supply chain ^{[10][11]}. Moreover, the COVID-19 pandemic has resulted in disruption to the mechanics of most economies, irrespective of their size and phase of development.

2. Globalization and Risk management

Globalization, shorter product lifecycles, multifaceted networks of trade partners located in many countries, uncertainty in market demands, cost pressures, outsourcing, and offshoring are a few risks in SCM ^{[12][13]}. The complexities of SCM are rising, and the networks are becoming more complex, resulting in more uncertainty in the business environment ^{[14][15][16][17]}. These represent risk events in supply chains that impact the entire supply chain network ^{[18][19][20]}. A risk event is an indicator of a threat that disrupts a supply chain^[19]. Global supply chains have many challenges and greater risks^{[21][22]}. The dependence on an organization for parts has changed to a supply chain^[23]. This requires greater transparency and sharing of information among supply chain players.

Global production practices have changed due to globalization and nations' economic engagements with partner countries. These have increased complexities and various forms of risks in supply chains. Organizations have created warehouse facilities, production plants, and fulfillment centers across countries to achieve cost benefits, access to cheaper raw material sources, or specialist skills and capabilities^[24]. The distribution centers in the modern era of global supply chains are also known as fulfillment centers. A fulfillment center is where customer demands are fulfilled. Therefore, these centers must be efficient because these centers' efficiency affects the entire SCM value.

3. Research Implications in SCRM

Global supply chains require a retrieval plan to ease the effects of disasters ^[25]. There needs to be a strategic plan, because uncertainties and risks surround the supply chain environment. Therefore, quick recovery is the prime objective after a risk incident has occurred. The formation of suitable risk recovery models also needs planning and a combination of information and human intervention. There are a few authors who have suggested empirically grounded research tools in SCM^[26], such as mathematical programming models and simulation models^[27], analytical hierarchy processes ^[28], complexity and graph theories^[29], and the development of models considering interdisciplinary research ^[30] for further research in SCRM.

There are different payment processes in the imports and exports of goods. The two methods are prominent, namely, direct payment between the parties, and through a third party such as a bank. In the case of advance payment, the financial risk in a supply chain is high, particularly for making payments to new vendors in different countries. Direct payment requires trust and relationships and is avoided where trust between the two parties is not strong. In such cases, parties choose a financial mediatory, such as a bank, to make the payment through a letter of credit. Banks play a significant role, but this increases the cost of supply chains. The process involves considerable documentation, which delays the process and increases the risk due to currency fluctuations or trade embargoes.

^[31]suggest that a system can be projected for innovative ideas to the ambiguous business environment. A cohesive approach to SCRM needs to incorporate risk issues from industry practice^[32]. Industry 4.0 is expected to significantly impact the visibility of the SC. Modern technologies such as Radio-frequency identification (RFID), ERP, and General Packet Radio Service (GPRS) will become important tools for SCRM^{[22][27][28][33]}. However, almost all shipping transactions involve many documents such as seller contracts, charter party agreements, bills of lading, certificates of origin, port documents, letter of credit (LC), and many other documents related to a vessel's consignment ^[34].

Identifying and harmonizing strategies for different types of risk is an essential factor for success in risk management ^[35]. There needs to be a corrective approach for recurrent risks for evaluating the costs of increasing or decreasing inventories, capacity, flexibility, responsiveness, and capability. Managing disruptive risks will require designing supply chains where the resource in question (parts inventory or the number of suppliers) is never completely centralized^[6]. For instance, Samsung Electronics Co. Ltd. has two vendors to supply necessary electronic parts, even though the second vendor contributes only about 20% of the volume^[36]. The implications of these principles are simple to understand. The benefit of having multiple fulfillment centers at various locations reduces the supply chain risk network without increasing the cost and minimizing the risk.

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