

Analysing the risk in the supply chain of apparel industry during an epidemic outbreak

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Abstract

Companies try to continue in business but struggle because of disruptions they face in the supply chain (SC). In this research, it is explored the SC risks faced by the apparel industry during an epidemic outbreak. It aims to investigate what type of risks are associated during an epidemic outbreak and how it has affected the SC. Further, it is investigated which risks should be prioritized, how to develop a suitable model to identify the SC risks and vulnerabilities. The data is collected from literature, interviews and surveys from leading personnel in the Sri Lankan apparel industry. It is then mapped in a vulnerability matrix, tested and validated. In this study, it is identified that the loss of international key suppliers and order cancellations are the riskiest. A generalized vulnerability model is developed in this study considering cost and time factors, however, it can be customized using different factors and risks depending on the experience and needs of the company. The study can be further developed to identify the SC risk mitigation strategies that should be taken to mitigate the SC disruptions during an epidemic outbreak.

Keywords

Supply Chain Disruptions, Supply Chain Risks, Epidemic Outbreak, Risk Model, Vulnerability Model

1. Introduction

A supply chain (SC) disruption is any sudden change or crisis which negatively impacts the interconnectedness of a network of people, organizations, and activities where the movement of a product from a supplier to a final customer is affected (Meyer, 2020). This effect can be either local or global. "It's impossible to anticipate the arrival of global crises such as the coronavirus outbreak, but firms can mitigate their impacts by taking supply chain preparedness to a higher level", says James B. Rice, Jr. in an article published in Harvard Business Review (Rice, Jr., 2020).

Supply chain disruptions can occur in a company because of legal disputes, strikes, natural disasters such as the 2011 Japan Tsunami. It reduced Japan's exports between 0.5% to 1.6% (Escaith et al., 2011). Manmade catastrophes where a brake-fluid proportioning valve supplier was under fire on 1st February 1997 which led Toyota to shut down all its plants and assembly lines and caused a sales loss of 70,000 vehicles (Ziaul et al., 2015; Nishiguchi & Beaudet, 2002). And special cases like epidemic outbreak (Ebola, SARS, MERS, Swine flu, and coronavirus/ COVID-19) (Ivanov, 2020). Due to COVID-19, China's industrial production has decreased by 13.5% for the month of January and February 2020, compared to the previous year figures (Seric et al., 2020). More than 75% of U.S. businesses have experienced supply chain disruption as a result of the COVID-19 outbreak (Leonard, 2020; Meyer, 2020; Hobbs, 2020).

The apparel supply chain aims to provide the right fashion products, simultaneously to satisfy the market needs, with the lowest possible cost, fastest speed and maximized profit (Hui and Choi, 2016). "No-one wants to buy clothes to sit at home in," says Simon Wolfson (McIntosh, 2020). Due to the coronavirus the fashion industry has been negatively impacted on every imaginable level where production has ceased, retailers have closed and demand has plummeted to 34% in March because apparel is not a basic human need (McIntosh, 2020). Therefore, the demand for apparels during a pandemic was very low. However, its contribution to the economy is significant. In 2018, the global clothing and apparel market reached a value of \$758.4 billion and has been growing at a compound annual growth rate (CAGR) of 7.5% since 2014 (Businesswire, 2020). Moreover, the target for 2022 which was set before the onset of COVID-19 was a CAGR of 11.8% to nearly \$1,182.9 (Businesswire, 2020). Furthermore, the Sri Lankan apparel industry