

## Development of a Conceptual Framework for Supply Chain Management Strategies Maximizing Resilience in Volatile Business Environments: A Case of Ventilator Challenge UK

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**Abstract :** Over the last two decades, an unprecedented growth in uncertainty and volatility in all aspects of the business environment has caused major global supply chain disruptions and malfunctions. The effects of one failed company in a supply chain can ripple up and down the chain, causing a number of entities or an entire supply chain to collapse. The complicating factor is that an increasingly unstable and unpredictable business environment fuels the growing complexity of global supply chain networks. That makes supply chain operations extremely unpredictable and hard to manage with the established methods and strategies. It has caused the premature demise of many companies around the globe as they could not withstand or adapt to the storm of change. Solutions to this problem are not easy to come by. There is a lack of new empirically tested theories and practically viable supply chain resilience strategies. The mainstream organizational approach to managing supply chain resilience is rooted in well-established theories developed in the 1960-1980s. However, their effectiveness is questionable in currently extremely volatile business environments. The systems thinking approach offers an alternative view of supply chain resilience. Still, it is very much in the development stage. The aim of this explorative research is to investigate supply chain management strategies that are successful in taming complexity in volatile business environments and creating resilience in supply chains. The design of this research methodology was guided by an interpretivist paradigm. A literature review informed the selection of the systems thinking approach to supply chain resilience. Therefore, an explorative single case study of Ventilator Challenge UK was selected as a case study for its extremely resilient performance of its supply chain during a period of national crisis. Ventilator Challenge UK is intensive care ventilators supply project for the NHS. It ran for 3.5 months and finished in 2020. The participants moved on with their lives, and most of them are not employed by the same organizations anymore. Therefore, the study data includes documents, historical interviews, live interviews with participants, and social media postings. The data analysis was accomplished in two stages. First, data were thematically analyzed. In the second stage, pattern matching and pattern identification were used to identify themes that formed the findings of the research. The findings from the Ventilator Challenge UK case study supply management practices demonstrated all the features of an adaptive dynamic system. They cover all the elements of supply chain and employ an entire arsenal of adaptive dynamic system strategies enabling supply chain resilience. Also, it is not a simple sum of parts and strategies. Bonding elements and connections between the components of a supply chain and its environment enabled the amplification of resilience in the form of systemic emergence. Enablers are categorized into three subsystems: supply chain central strategy, supply chain operations, and supply chain communications. Together, these subsystems and their interconnections form the resilient supply chain system framework conceptualized by the author.

**Keywords :** enablers of supply chain resilience, supply chain resilience strategies, systemic approach in supply chain management, resilient supply chain system framework, ventilator challenge UK

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