

## Big Data in Mitigating Systemic Supply Chain Risks: A Systems Perspective with Case Studies

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### Abstract

Supply chains are complex socio-technical systems by nature with several layers of entities interlinked with increasingly complex web of network connections of varying degrees. Today as supply chains span farther and wider across the globe, they are exposed to greater levels of risks that need to be anticipated and understood sufficiently well to be able to manage it. By taking a systems perspective, we introduce a framework to define and delineate the specific risks in supply chains. We show that supply chain risks can be classified as systemic risks, systematic risks, security risks, and idiosyncratic risks. We relate this framework to other existing frameworks of risk management, and focus on the systemic risks related to the systems characteristics. We then discuss how big data and analytics can be managed in a supply chain to mitigate the systemic risk that arise from the network, relational, and temporal characteristics that relate to the complexity of the supply chains.

**Keywords:** Supply Chain Management, Supply Chain Risk Management (SCRM), Supply Chain Network, Complexity, Big Data.