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Artificial Intelligence Techniques for Enhancing Supply Chain Resilience: A Systematic Literature Review, Holistic Framework, and Future Research

Authors : Adane Kassa Shikur

Abstract : Today's supply chains (SC) have become vulnerable to unexpected and ever-intensifying disruptions from myriad sources. Consequently, the concept of supply chain resilience (SCRes) has become crucial to complement the conventional risk management paradigm, which has failed to cope with unexpected SC disruptions, resulting in severe consequences affecting SC performances and making business continuity questionable. Advancements in cutting-edge technologies like artificial intelligence (AI) and their potential to enhance SCRes by improving critical antecedents in the different phases have attracted the attention of scholars and practitioners. The research from academia and the practical interest of the industry have yielded significant publications at the nexus of AI and SCRes during the last two decades. However, the applications and examinations have been primarily conducted independently, and the extant literature is dispersed into research streams despite the complex nature of SCRes. To close this research gap, this study conducts a systematic literature review of 106 peer-reviewed articles by curating, synthesizing, and consolidating up-to-date literature and presents the state-of-the-art development from 2010 to 2022. Bayesian networks are the most topical ones among the 13 AI techniques evaluated. Concerning the critical antecedents, visibility is the first ranking to be realized by the techniques. The study revealed that AI techniques support only the first 3 phases of SCRes (readiness, response, and recovery), and readiness is the most popular one, while no evidence has been found for the growth phase. The study proposed an AI-SCRes framework to inform research and practice to approach SCRes holistically. It also provided implications for practice, policy, and theory as well as gaps for impactful future research.

Keywords : ANNs, risk, Bauesian networks, vulnerability, resilience
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