Digital Transformation for Enhancing Resilience and Flexibility in Automotive Supply Chains under VUCA Conditions: A Systematic Literature Review

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Abstract. In an era marked by Volatility, Uncertainty, Complexity, and Ambiguity (VUCA), the resilience and flexibility of automotive supply chains have become paramount. This paper presents a systematic literature review of 26 peer-reviewed articles published between 2019 and 2025, focusing on the role of digital transformation in reinforcing supply chains against disruptions. The study identifies the most impactful digital technologies, such as digital twins, artificial intelligence, blockchain, IoT, and their strategic integration into supply chain design, visibility and responsiveness frameworks. The findings reveal that digital transformation not only enhances operational resilience and real-time adaptability but also facilitates predictive maintenance, resource coordination, and data-driven decision-making. Furthermore, the review outlines sector-specific and regional variations, highlighting gaps in implementation across emerging economies. The study offers a structured understanding of current trends and future research avenues. This research contributes to the ongoing discourse on digital supply chain innovation by providing an evidence-based synthesis valuable to practitioners and academics aiming to future-proof global automotive supply networks.

Keywords: VUCA, Resilience, Flexibility, Automotive Supply Chains, Digital Transformation, Digital Twin, AI, Systematic Literature Review.