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Forging Resilience in Manufacturing Strategy: An Interdisciplinary Approach in a VUCA World

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Abstract

In a VUCA environment, marked by volatility, uncertainty, complexity, and ambiguity, developing a resilient Manufacturing Strategy (MS) is fundamental for adapting and transforming adversities into opportunities, ensuring long-term competitiveness and sustainability. This study identifies key strategies and enablers for developing a resilient MS. This study employed a systematic five-stage literature review, using SCOPUS and WoS for data collection and VosViewer® and Atlas.ti® for bibliometric and content analysis, respectively. Conducted in March 2024, the process narrowed down from 1,144 articles to 232 for in-depth examination, focusing on identifying research opportunities. Post-2020, there has been a significant increase in the academic focus on Manufacturing Strategy (MS) and its resilience, identifying critical research areas such as the development of resilient theoretical frameworks and the enhancement of strategic resilience in manufacturing. This analysis underscores the importance of agility and proactiveness in manufacturing systems, emphasising the necessity of incorporating uncertainty into strategic decision-making. Furthermore, the pivotal role of technological innovation, particularly through the adoption of Industry 4.0 technologies, in strengthening organisational resilience is highlighted. Findings were categorised into resilience approaches, components thereof, and MS-specific resilience, offering a structured and in-depth view of the field and promoting an interdisciplinary approach that integrates strategic management, advanced technology, and the analysis of cultural and organisational dynamics. This comprehensive view is essential for designing resilient manufacturing systems in the face of global volatility, setting a research precedent for future explorations in resilient and adaptive manufacturing practices.

Keywords
Manufacturing strategy, resilience, resilient manufacturing strategy, MS enablers, resilient capabilities, VUCA.

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Cristian Rincón Guio is a full-time professor at the Corporación Universitaria Minuto de Dios – UNIMINUTO – (Colombia), affiliated with the virtual engineering programme of the virtual rectorate. Due to his diligent work as a researcher, he has been recognised as an associate researcher by the Colombian Ministry of Science, Technology, and Innovation (MINCIENCIAS). Additionally, he serves as a project reviewer for MINCIENCIAS and an academic evaluator for the Colombian Ministry of Education. Professionally, he is an industrial engineer, having obtained his master's in industrial management from the University of Viña del Mar in Chile, and is currently a doctoral student in Engineering, Industry, and Organisations at the National University of Colombia, under the mentorship of Professor Dr. William Sarache. His areas of activity and interest include manufacturing strategy, the study of resilience in

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