Chapter 8
Systematic Literature Review of Supply Chain Management and Metaverse

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ABSTRACT

This study explores the transformative role of the Metaverse in reshaping supply chain management amid rapid technological advancements. It critically examines how this emerging technology impacts key areas such as demand forecasting, operations, inventory management, and logistical resilience—highlighting gains in efficiency, agility, and strategic decision-making. Through a holistic approach combining literature review and real-world use cases, the study reveals how the Metaverse and generative AI can foster intelligent, sustainable, and adaptive supply chain ecosystems. It offers a practical model for industry practitioners aiming to harness these technologies for optimization. The findings underscore the importance of continued research into the long-term implications of Metaverse adoption, particularly its broader influence on industry standards and societal outcomes. Ultimately, this work contributes to the growing body of knowledge and illustrates the revolutionary potential of the Metaverse in supply chain transformation.

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1. INTRODUCTION

In the fast-evolving environment of modern commerce, the efficient management of supply chains has become increasingly critical for sustaining competitive advantage and meeting customer expectations. As businesses strive to channelize through the complexities of global markets, the integration of advanced technologies has emerged as a cornerstone for driving innovation and optimization within supply chain operations. the metaverse stand out as transformative forces, offering unprecedented opportunities to enhance efficiency, resilience, and strategic decision-making. This sets the stage for exploring the forward-looking perspective on leveraging metaverse to unlock the optimization potential in supply chain management. The supply chain management (SCM) field has undergone pro- found transformations due to technological advancements. Metaverse, have gained significant attention in recent years (El Jaouhari, Arif, Samadhiya, et al., 2024; Pellegrino et al., 2024). The Metaverse offers unique attributes that distinguish it from these technologies. The Metaverse underscores service-oriented sustainability and social engagement, creating a scalable environment that fosters a heightened sense of community (El Jaouhari, Arif, Jawab, et al., 2024; Mahdikhani & Meena, 2024)

What is the metaverse? The term 'metaverse' was coined in 1992 in Neal Stephenson's literary work, Snow Crash, visualizing it as a black spherical planet accessible to users through terminals with integrated virtual reality capabilities and where users could appear as avatars(Polas et al., 2022). According to El Jaouhari et al., (2024), "The metaverse is the next evolution of the Internet. It's a fusing of the digital and physical worlds powered by technologies, including virtual and augmented reality, blockchain, artificial intelligence, and the Internet of things that connects smart devices". Lovich (2022) defines the metaverse as "a combination of the virtual reality and mixed reality worlds accessed through a browser or headset, which allows people to have real time interactions and experiences across distance." Metaverse develops fast. Digital technology leaders like Nvidia with Omniverse and Facebook with Meta profoundly invest in metaverse solutions (Chen et al., 2023). Supply On sup-plier collaboration platform (De Giovanni, 2023) and the Catena-X data ecosystem have been developed in automotive industry allowing for creation of digital product passports and improving sustainability and resilience of supply chains from the ecosystem perspective (Patnaik et al., 2024).

As a fusion of various technologies, scholars have pointed out that the metaverse combines the real world with the digital world, thus supplying users with a new and fundamentally enhanced real-life experience. During the industrial transformation caused by metaverse, as an important part of the industrial sector, manufacturing enterprises are seeking more advanced digital technology to improve production efficiency in the face of multiple pressures of technological progress and personalized