

Chapter 8

The Role of Technologies in Facilitating Circular Economy of China's E-Commerce Section

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ABSTRACT

The burgeoning e-commerce sector in China stands at the crossroads of technological innovation and sustainable development, particularly within the context of circular economy. This paper explores the multifaceted role that technologies play in enhancing circular economic practices within this rapidly evolving industry. The primary questions addressed are: (1) What key technologies are influencing China's circular economy in e-commerce sector? (2) How can we assess the impact of these technologies on circular economy of China's e-commerce? (3) What are the broader applications and potential challenges for scaling these practices? Employing the analytical capabilities of CiteSpace, this study identifies and identifies and maps out the key technologies that are pivotal in facilitating a circular economy. These include advancements in big data analytics, blockchain for supply chain transparency, IoT for resource monitoring, and AI-driven platforms for waste reduction and materials management. By highlighting the interconnectedness of these technologies, the study offers a comprehensive overview of the technological ecosystem propelling the circular economy. The paper then transitions to an evaluative framework, using case studies to gauge the effectiveness and impact of these technologies. By examining real-world applications in the e-commerce sector, the study provides qualitative insights into how technology not only drives efficiency and sustainability but also engenders new business models and consumer behaviors aligned with circular economic principles. Lastly, the broader implications of

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these findings are discussed, alongside scaling opportunities. The paper argues that the integration of technology in circular economic practices is instrumental for green technology and serves as a catalyst for competitiveness and innovation on a global scale. The study also provides recommendations for policymakers and industry stakeholders to leverage the potential of technology within the e-commerce sector to advance a more resource-efficient, circular economy.

1. INTRODUCTION

The e-commerce sector stands at a crossroads of environmental responsibility and economic opportunity. In 2022, over 75% of young people were internet users, and the global population of mobile phone users exceeded 7.2 billion. The advent of The digital and smart economy in China has facilitated the emergence of new avenues for growth and development (Yu, Chen, & Ahuja, 2022). Digital platforms are at the heart of this change, providing a marketplace for businesses and consumers (Shang & Zong, 2024). There is a demand for developing new, cost-effective waste management methods that can lead to a more circular economy (Ambaye et al., 2023). The circular economy, a system that minimizes waste and energy leakage by slowing and narrowing material and energy loops (Bittner, Bakker, & Long, 2024), has emerged as a transformational approach to achieving sustainability within this digital marketplace. The circular economy is a model in the realm of economy that is designed to promote the well-being of people and the conservation of the environment. It is based on the principles of reprocessing, production, resourcing, and purchasing (Tiwari, Si Mohammed, Mentel, Majewski, & Shahzadi, 2023). It centers on the efficient use and possible recycle of resources, embracing the principles of “reduce, reuse, and recycle” with the features of less consumption, less emissions, and higher efficiency . This research delves into the heart of innovation, examining how emergent technologies are not just influencing, but actively shaping the circular economy within e-commerce. The primary goal is to unravel the intricate tapestry of technological advancement and sustainable development, answering a central question: How are emergent technologies influencing circular economy within e-commerce industry?

With a plethora of technologies vying for attention, it is crucial to sift through the noise and identify those that hold the key to sustainable transformation. This research begins by evaluating the myriads of technologies implemented across the e-commerce landscape, assessing their potential to foster circular economy practices. From the adoption of artificial intelligence for optimized resource management to blockchain for enhanced transparency and trust, we scrutinize the criteria that elevate a technology from being merely “useful” to “indispensable” for circularity.

Moving beyond identification, this study probes into the tangible impacts these technologies impart on business models, supply chains, and product life cycles. It explores the environmental and economic repercussions of integrating such technologies and gauges their influence on consumer behavior. By dissecting case studies and synthesizing data, we aim to offer a clear view of how technological interventions are recalibrating the e-commerce sector towards a more circular *modus operandi*.

Finally, this research expands its focus to the vast horizon of possibilities that these technologies open up for the e-commerce industry and beyond. It considers the broader implications for global sustainability goals, while also addressing the challenges that may arise in scaling these technologies in different contexts. Through this lens, we explore the innovation opportunities that lie ahead and provide a comprehensive roadmap for stakeholders to effectively leverage the full potential of technology to promote the circular

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