

Sustainable Innovation through Digital Transformation: Leveraging AI for Circular Economy Models

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Abstract: *The transition to a circular economy, where resources are reused, recycled, and repurposed to minimize waste, demands innovative approaches that transcend traditional linear models. Digital transformation, powered by artificial intelligence (AI), offers a transformative pathway to achieve sustainable innovation by optimizing processes, enhancing decision-making, and fostering systemic change. This research explores how AI-driven digital transformation can enable circular economy models, with a focus on practical applications in the Consumer Packaged Goods (CPG), healthcare, and medical technology (med-tech) industries. Drawing from real-world insights in consulting for CPG and healthcare firms, as well as current experience in med-tech, this study examines how AI technologies—such as predictive analytics, supply chain optimization, and product lifecycle management—can reduce waste, improve resource efficiency, and drive sustainability. Through a mixed-method approach combining case studies, industry data analysis, and theoretical frameworks, the paper identifies key opportunities and challenges in leveraging AI for circularity. The findings aim to provide actionable strategies for organizations seeking to integrate digital transformation into sustainable practices, contributing to both environmental goals and economic resilience.*

Keywords: Sustainable Innovation , Digital Transformation, Artificial Intelligence (AI) , Circular Economy, Resource Efficiency, Industry Applications

