

## From Waste to Wealth: A Future Paradigm for Plastic Management Using Blockchain Technology

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**Abstract :** The world has been experiencing a steadily increasing trend in both the production and consumption of plastic. The global consumer revolution should not have been possible without plastic, thanks to its salient feature of inexpensiveness and durability. But, as a two-edged sword, its durable quality has returned to haunt and even jeopardized us. That exacerbating the plastic crisis has attracted various global initiatives and actions. Simultaneously, firms are eager to adopt new technology as they witness and perceive more potential and merit of Industry 4.0 technologies. For example, Blockchain technology (BCT) is drawing the attention of numerous stakeholders because of its wide range of outstanding features that promise to enhance supply chain operations. However, from a research perspective, most of the literature addresses the plastic crisis from either environmental or social perspectives. In contrast, analysis from the data science perspective and technology is relatively scarce. To this end, this study aims to fill this gap and cover the plastic crisis from a holistic view of environmental, social, technological, and business perspectives. In particular, we propose a mathematical model to examine the inclusion of BCT to enhance and improve the efficiency on the upstream and the downstream sides of the plastic value, where the whole value chain is coordinated systematically, and its interoperability can be optimized. Consequently, the Environmental, Social, and Governance (ESG) goal and Circular Economics (CE) sustainability can be maximized.

**Keywords :** blockchain technology, plastic, circular economy, sustainability

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