Chapter 8
Green Manufacturing in the Era of Industry 4.0: Applying People Analytics to Direct Consumer Purchasing Behavior and Intentions

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ABSTRACT

The escalating need for sustainable materials and responsible consumption has placed green entrepreneurship at the heart of current market strategies. For businesses to significantly impact consumer preference for green products they must learn more about the motivations behind these choices. This document analyzes the role of people analytics in steering consumer decisions towards sustainable products and points out the extensive benefits of integrating sustainability into business practices. Through an analysis of case studies and a systematic literature review. This research outlines the connection between sustainable business adoption and people analytics. Existing research on eco-friendly consumer behavior and business models informs the SLR's analysis of significant variables affecting customer preferences including sustainability and ethical shopping.

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1.1 INTRODUCTION

The global landscape of manufacturing is undergoing a profound transformation driven by urgent environmental concerns and the rapid advancement of digital technologies. As climate change and resource depletion increasingly impact societies and economies, businesses are compelled to embrace sustainable practices. Green manufacturing—defined as the production of goods with minimal environmental impact—is becoming a critical strategy for organizations seeking to enhance their competitiveness and respond to consumer demand for eco-friendly products (Zhang & Liang, 2018). This chapter delves into the synergy between green manufacturing and Industry 4.0, highlighting how the integration of innovative technologies and people analytics can significantly shape consumer purchasing behavior and intentions towards sustainable products.

The fourth industrial revolution, characterized by the adoption of smart technologies and data-driven decision-making, presents a unique opportunity for manufacturers to optimize their processes and minimize waste (Kamble, Gunasekaran, & Gawankar, 2018). Industry 4.0 technologies—including the Internet of Things (IoT), artificial intelligence (AI), and big data analytics—enable real-time monitoring and optimization of production processes, thereby enhancing resource efficiency and sustainability (Xu, Xu, & Li, 2018). By leveraging these technologies, organizations can not only improve their operational performance but also align their manufacturing practices with the growing consumer preference for sustainability.

As consumers become more environmentally conscious, their purchasing decisions are increasingly influenced by a brand's commitment to sustainability (Vermeir & Verbeke, 2008). Consequently, businesses must adapt their marketing strategies to resonate with this shift in consumer behavior. People analytics, which encompasses the analysis of consumer data to derive insights into preferences and behaviors, offers a powerful tool for organizations seeking to understand and influence consumer purchasing intentions (Bohdanowicz & Zientara, 2008). By integrating people analytics into their business models, manufacturers can identify and address the specific factors that drive consumer preferences for green products, ultimately enhancing their market positioning.

This chapter aims to provide a comprehensive framework for understanding the interplay between green manufacturing, Industry 4.0, and consumer behavior, with a particular emphasis on how people analytics can facilitate the adoption of sustainable practices in the manufacturing sector. By examining the challenges and opportunities presented by this convergence, the chapter will contribute to the growing body of knowledge on sustainable manufacturing and consumer behavior in the context of the fourth industrial revolution.