Chapter 2
AI, Fashion, and Climate Conscious Consumers Promoting Sustainable Consumption Through Intelligent System

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ABSTRACT

This chapter explores the transformative role of Artificial Intelligence (AI) in addressing the environmental and social challenges of the global fashion industry. It outlines the significant ecological footprint of fast fashion, including excessive water use, carbon emissions, and microplastic pollution. By integrating AI with digital tools such as blockchain, digital wardrobes, and smart labels, fashion brands can enhance transparency, traceability, and sustainability. The chapter further discusses how AI-driven personalization, recommendation systems, and sentiment analysis empower climate-conscious consumers to make informed ethical choices. While

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AI presents opportunities for circular fashion and real-time behavioral insights, it also introduces risks related to privacy, algorithmic bias, and greenwashing. Through an ethical lens, this chapter emphasizes the need for inclusive governance, data transparency, and responsible design in deploying AI for sustainable fashion transformation.

INTRODUCTION

The fashion industry is widely recognized as one of the most resource-intensive and environmentally damaging global industries. High water consumption, greenhouse gas emissions, chemical pollution, and escalating textile waste have positioned fashion consumption as a significant contributor to climate change and ecological degradation. The rise of fast fashion has further intensified these challenges by promoting high-volume, low-cost production cycles that encourage overconsumption and shorten garment lifespans. Beyond environmental impacts, the fashion industry is also associated with persistent social issues, including labor exploitation, unsafe working conditions, and systemic inequality across global supply chains.

In recent years, growing public awareness of climate change and social responsibility has led to the emergence of climate-conscious consumers—individuals who actively consider environmental and ethical implications in their purchasing decisions. These consumers increasingly demand transparency, accountability, and sustainability from fashion brands. However, despite heightened awareness, significant information asymmetries remain. Sustainability claims are often difficult to verify, supply chains lack visibility, and greenwashing practices undermine consumer trust. As a result, consumers face structural barriers that limit their ability to translate ethical intentions into informed and consistent consumption behavior. AI's role in fostering sustainable fashion through innovation in production, retail, and consumer engagement (Vladimirova et al., 2024)

Digital technologies have begun to reshape this landscape by mediating the relationship between fashion brands and consumers. Among these technologies, artificial intelligence (AI) has gained particular attention for its capacity to process large-scale data, personalize consumer experiences, and enhance operational efficiency. Within the context of sustainable fashion, AI-powered systems can support demand forecasting, inventory optimization, transparency tools, and personalized recommendations that align consumption with environmental and ethical values. Rather than functioning solely as efficiency-driven tools, intelligent systems increasingly operate as socio-technical infrastructures that influence consumer awareness, decision-making, and behavioral change. AI tools like image recognition and natural