Chapter 1
Green by Design AI in Fashion Retail and the Rise of the Conscious Consumer

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ABSTRACT

The fashion industry stands at a transformative crossroads, where artificial intelligence (AI) and sustainable values reshape consumer behavior and retail strategies. Green by Design: AI in Fashion Retail and the Rise of the Conscious Consumer investigates how AI-driven personalization, product recommendations, and algorithmic nudging can foster environmentally responsible choices while navigating the ethical limits of automated influence. This volume presents theoretical and empirical contributions that examine social trust as a critical mediating factor in the relationship between AI technologies and sustainable consumer decisions. Trust—both in technology and in the ethical intent of fashion brands emerges as a determinant of consumer

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receptivity to AI-guided sustainable behavior. Through interdisciplinary analysis that spans marketing, data ethics, psychology, and digital retail, the book explores how perceived transparency, fairness, and inclusivity in AI systems influence the formation of social trust and, in turn, amplify or constrain sustainable consumption.

1. INTRODUCTION

The advent of Large Language Models (LLMs) has heralded a profound transformation within Artificial Intelligence, particularly since the public release of models such as ChatGPT in November 2022 (Petroșanu et al., 2023). These sophisticated systems have rapidly captured considerable attention due to their exceptional performance across various natural language tasks. Their remarkable ability to comprehend and generate human-like text at an unprecedented scale has positioned them as pivotal components in the ongoing development of general-purpose AI systems(Triguero et al., 2023). The field itself is characterized by an extraordinary pace of evolution, with novel models, groundbreaking findings, and innovative techniques emerging within mere months or weeks (Sridhar et al., 2025; Corea, 2017). This rapid velocity underscores the critical need for timely and comprehensive surveys, which serve as invaluable resources for researchers and practitioners navigating this dynamic landscape. The sheer volume of new information makes it challenging for AI researchers and practitioners to discern the most effective approaches for building LLM-powered AI systems for their specific tasks (Yang et al., 2024; D'Souza et al., 2025). This review aims to consolidate the current body of knowledge, offering a structured and accessible overview to mitigate this confusion and accelerate practical application in a highly dynamic environment.

1.1 Defining LLMs and FMs, Distinguishing Them From Earlier Language Models

To fully appreciate the current state of AI, it is essential to delineate the concepts of Large Language Models and Foundation Models, distinguishing them from their predecessors (Gallotta et al., 2024).

Large Language Models (LLMs): Primarily, LLMs are characterized as transformer-based neural language models with many parameters, typically ranging from tens to hundreds of billions. These models are pre-trained on immense quantities of text data. Prominent examples that have defined this category include the GPT, LLaMA, and PaLM families (Raiaan et al., 2024). The distinction between LLMs and earlier pre-trained language models (PLMs) is not merely quantitative regarding model size. Crucially, LLMs exhibit superior language understanding