Chapter 6
Artificial Intelligence and Earth Observation Data for Sustainable Agile Marketing Management

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ABSTRACT

This chapter explores integrating Artificial Intelligence (AI) and Earth Observation (EO) Data to address global supply chain challenges, focusing on sustainability and agility. It highlights AI's potential in optimizing supply chain operations and EO data's role in environmental monitoring, considering placement as a marketing mix. The study showcases AI's capability to enhance supply chain transparency and accountability, contributing to environmental and social sustainability goals. The proposed framework integrates Socio-Technical Systems principles, acknowledging the interplay of human and organizational factors in sustainability-oriented Supply Chain Management (SCM). It emphasizes the importance of social and organiza-

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tional viability, aiming to facilitate the integration of AI and EO data into SCM, promoting sustainability, efficiency, and resilience. By exploring AI and EO data within SCM, this chapter provides a foundation for understanding their combined potential in addressing supply chain challenges.

INTRODUCTION

Agile marketing, characterized by its emphasis on flexibility, rapid iteration, and data-driven decision-making, has found a powerful ally in Artificial intelligence (AI) and EO data. Recent studies have shown that organizations adopting AI-driven agile marketing strategies can improve customer engagement metrics by up to 30% (Hemalatha, 2023). AI technologies, particularly machine learning and natural language processing, have revolutionized how marketers understand and interact with their audiences. For instance, AI-powered chatbots can handle up to 80% of routine customer inquiries, freeing human agents to focus on more complex interactions (Adam et al., 2021).

In this chapter, we will explore the main points of a broader study that seeks to describe the main opportunities and challenges of marketing involving artificial intelligence algorithms in social media, including the intersection between creativity and technology, the importance of critical thinking, and the tools and algorithms of interest to the success of digital marketers.

AI uses "intelligent agents" – decentralized machine learning mechanisms that overcome analytical limitations through cyclical and repetitive processes. Although not a new concept, AI helps analyze, integrate, manage, and secure data from heterogeneous sources (Benbya et al., 2020). The harmonious integration of internal and external sources and data - both structured and unstructured - enables sophisticated analysis, leading to proactive management that is adaptable to social demands, fostering more representative partnerships with the various players in the production chain (Zietsman & van Vuuren, 2022).

The global supply chain, the backbone of modern commerce, facilitates the movement of goods across vast distances (Dauvergne, 2022). Despite its efficiency, this system incurs a high environmental and social cost, marked by challenges such as resource depletion, pollution, and unethical labor practices (Dwivedi et al., 2021). Addressing these issues necessitates a paradigm shift towards more environmentally responsible and socially conscious supply chain management practices.

Building upon the potential of AI and EO data integration, integrating both has emerged as a promising approach to tackling modern supply chains' complex and interconnected challenges (Tirkolaee et al., 2021), providing marketers with valuable tools to analyze data sets, optimize logistics, and identify areas for improved resource