

Chapter 8

Emerging Technologies AI and IoT For Sustainable Business Operations

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ABSTRACT

Artificial Intelligence(AI) and Internet of Things (IoT) enable the evolving landscape of sustainability in business operations by providing organizations with unprecedented access to strategies to address complex environmental, social, and economic challenges. They enable digital sustainable transformation in organizations and play a vital role in improving supply and value creation. This research finding aims to investigate the effects of sustainability in various business operations. It further delves into how AI and IoT foster sustainable innovation in enterprises. The role of AI and IoT on sustainable business operations is explained. It also elucidates the technology driven diverse business strategies employed by various enterprises to integrate sustainable business practices in their operations. This research report contributes to a profound understanding of harnessing AI and IoT as a pivotal factor in driving sustainable business operations.

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INTRODUCTION

Sustainability in business involves a company's approach and actions aimed at minimizing negative environmental and social effects caused by its operations in a specific market. An organization's sustainability efforts are usually evaluated using environmental, social, and governance (ESG) criteria. For example, sustainability enhances energy efficiency by adopting alternative energy sources and implementing carbon tracking. It also involves creating systems that lower greenhouse gas emissions, conserve water, and reduce waste. Sustainable business practices promote agile and efficient supply chains, support a circular economy, advocate for reuse, eliminate waste, foster responsible consumption, and safeguard natural resources. Additionally, it facilitates sustainable development by assessing risks, strengthening resilience, and complying with external regulations and development targets.

As irreversible changes to the Earth's systems unfold, the risks posed by climate change have become too significant to overlook. The surpassing of environmental limits is raising concerns about cascading effects on global ecosystems and societies. Businesses are feeling both the pressure and the opportunity to set sustainability goals, if they haven't already done so. Even amid the COVID-19 pandemic, companies continued to align with the United Nations General Assembly's sustainable development goals (SDGs), which were established in 2015 and are set to be met by 2030. The SDGs provide universal objectives that guide businesses toward sustainability, focusing on areas such as poverty, inequality, environmental degradation, and climate change.

AI and IoT have become integral to many aspects of our lives, influencing fields ranging from commerce and finance to education (Sushkova et al., 2021; Tang et al., 2021), communication, and social interaction (Gouvea et al., 2018), with their presence deeply embedded in our daily experiences (Sen et al., 2022). This widespread influence is a hallmark of a major shift known as the digital revolution (Ignat, 2017; Nosova et al., 2021). At the heart of this shift is sustainable digital transformation (Gomez-Trujillo & Gonzalez-Perez, 2021; Hilbert, 2020), a dynamic process driven by digital innovations that disrupt organizations and societies (Ignat, 2017; Vial, 2019). The effects of this transformation are far-reaching, significantly reshaping organizational strategies, value creation, and structural frameworks. The role of AI and IoT in sustainability and development is gaining attention (Feroz et al., 2021; Holmström, 2022), as these technologies allow organizations to enhance operations, streamline value chains, digitize processes, and improve efficiency (Feroz et al., 2023; Liu et al., 2020). The transformative power of AI and IoT is so groundbreaking that organizations are increasingly prioritizing strategies to incorporate them into their operations (Singh et al., 2019; Verhoef et al., 2019). These technologies are driving change not only within businesses (Vaska et al., 2021) but also in government (Benjamin & Potts, 2018; Clarke, 2019), society (Hilbert, 2020), and at national levels (Aly, 2022; Balogun et al., 2020; Nick et al., 2019). AI and IoT have diverse applications in areas like smart cities, smart manufacturing, sustainable supply chains, sustainable production, and smart farming (Feroz et al., 2023; Ghobakhloo, 2020). Their impact on green business trends is substantial, revolutionizing how companies address sustainability and environmental responsibility (Kamble et al., 2018; Liu et al., 2020). These technologies are fostering innovation in sustainable product development, circular economy initiatives (Sinkovics et al., 2021; Truant et al., 2024), and renewable energy adoption, supporting a shift toward a more sustainable future (Jain & Ranjan, 2020; Wahyudi Sumari, 2020). Today, companies are increasingly focusing on creating value through sustainable or green business practices, recognizing that these practices not only generate financial benefits but also contribute to sustainable development (Moşteanu et al., 2020; Sodhro et al., 2019; Weersink et al., 2018). Given the significance of these green disruptions enabled by AI and IoT,

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