


Chapter 2


Exploring Sustainable Technology Innovation and Green Tech Adoption Impacts on SDGs and Software Project Management

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ABSTRACT

We understand in this paper why the adoption of green technologies is crucial for achieving the (SDGs) and improving software project management practices. Green technologies play a vital role in addressing pressing environmental challenges while advancing economic growth, yet their adoption faces barriers such as high costs and technological complexity. This research also investigates the effects of green technology adoption on SDGs and identifies best practices for embedding these technologies into software project management frameworks. By examining case studies and industry methodologies, the study highlights actionable strategies

DOI: 10.4018/979-8-3373-7584-7.ch002

to align technological innovation with sustainability objectives. It underscores the importance of Agile Sustainability, Green Coding, and Life Cycle Assessment (LCA) as essential practices for optimizing project outcomes. The findings aim to equip policymakers, technology leaders, and project managers with insights to drive impactful, sustainable change, ensuring that technological progress contributes meaningfully to global development goals.

INTRODUCTION

In the contemporary landscape of global development, the integration of sustainable technology innovation and green technology adoption has emerged as a pivotal strategy for addressing pressing environmental challenges and achieving the United Nations Sustainable Development Goals (SDGs). The SDGs, established in 2015, encompass a broad spectrum of objectives aimed at fostering sustainable economic growth, social inclusion, and environmental protection (Adenle et al., 2023; Khan et al., 2024). As nations strive to meet these ambitious targets, the role of technology particularly in the realms of software project management and green innovations becomes increasingly significant. Sustainable technology innovation refers to the development and implementation of technologies that not only enhance productivity and efficiency but also minimize environmental impact (Ebrahim, 2020; Zhang et al., 2019). This innovation is crucial for transitioning towards a low-carbon economy, as it enables organizations to reduce their carbon footprints while maintaining competitive advantages (Shan et al., 2021, p. 113004; Song et al., 2023). For instance, the adoption of renewable energy technologies, such as solar and wind power, exemplifies how sustainable innovations can lead to significant reductions in greenhouse gas emissions (Fang, 2023; Suki et al., 2022). Furthermore, the integration of digital technologies, such as the Internet of Things (IoT) and artificial intelligence (AI), facilitates the monitoring and optimization of resource use, thereby enhancing sustainability efforts across various sectors (Li et al., 2022; Wu et al., 2022, pp. 22013–22023).

In the context of software project management, the adoption of green technologies presents both challenges and opportunities. Project managers are increasingly tasked with ensuring that their projects align with sustainability goals while also delivering on time and within budget (Wang et al., 2022; Zheng et al., 2022). This dual focus necessitates a shift in traditional project management practices, incorporating sustainability metrics into project planning and execution (Wang, 2022). For example, the implementation of agile methodologies can enhance flexibility and responsiveness, allowing teams to adapt to changing sustainability requirements and stakeholder expectations (Godil et al., 2021). Moreover, the intersection of sustainable

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