

## **An Analysis of Digital Adoption and Sustainability Strategies: A Twin Transition Approach**

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### **Abstract**

The term "twin transition" describes how organizations integrate their sustainability and digital transformation initiatives. Businesses are expected to not only innovate using digital technologies like automation, artificial intelligence, and data analytics, but also to lessen their environmental impact and work toward long-term sustainability in today's quickly changing world. The twin transition highlights that in order to establish sustainable competitiveness, digital and green transformations should support and strengthen one another rather than operate independently.

However, a lack of defined success factors, unclear frameworks, and unstructured implementation strategies make it difficult for many organizations to align digital innovation with sustainability goals. By investigating how businesses can successfully execute the twin transition, this study seeks to close that gap. The study

examines the advantages, difficulties, and effects of combining digital adoption with sustainability strategies using a descriptive research design and primary data gathered from respondents in various industries.

The results show that a long-term goal for sustainable performance, strong organizational practices, foundational success factors, and clear triggers are necessary for a successful twin transition. In the end, combining digital transformation with sustainability efforts improves competitive advantage, efficiency, resilience, and regulatory preparedness, opening the door for long-term value creation.

**Keywords:** Twin Transition, Digital Transformation, Sustainability Strategies, Sustainable Competitiveness, Business Resilience

## I. INTRODUCTION

The Twin Transition aims to integrate sustainability and digital growth. These days, companies prioritize both the environment and profits. Organizations can operate more efficiently with the use of digital tools like automation, data analytics, artificial intelligence, and smart technologies. They help businesses make better decisions based on actual data, waste reduction, save energy, and increase efficiency. To put it simply, technology now involves more than just innovation; it also involves responsibility.

Organizations generate long-term value rather than short term gains when they match their digital strategies with sustainability objectives. The Twin Transition pushes businesses to view environmental responsibility and digital transformation as complementary rather than distinct efforts. Businesses can increase performance, maintain competitiveness, foster stakeholder trust, and get ready for new regulations by combining the two. In the end, this strategy makes sure that development doesn't harm the environment; rather, it promotes social and environmental well-being in addition to economic advancement.

### **Objectives:**

1. To examine how digital technologies support and enhance organizational sustainability strategies.
2. To analyse the impact of integrating digital adoption with environmental and resource efficiency initiatives.
3. To assess the benefits and challenges of implementing the Twin Transition for long-term organizational performance

### **Scope of the Study**

The research scope of this study is to analyse the combined effect of digital technology adoption and sustainability strategies in organizations using the Twin

Transition method. This study investigates the impact of digital technology adoption, such as artificial intelligence, automation, cloud computing, and data analytics, on environmental sustainability strategies, efficiency, and strategic performance in various industries, especially in the manufacturing and service sectors. This study also investigates the use of digital transformation in green transformation, which aims to increase resource efficiency, reduce negative environmental effects, and support the decarbonisation process.

Furthermore, this study investigates the organizational and management issues related to the implementation of twin transition strategies, such as change resistance, cost barriers, technology complexity, and human resource limitations. This study also assesses the impact of combining digital innovation with sustainability strategies on sustainable competitiveness and long-term value creation. Through this analysis, the research study aims to provide practical insights for organizations to achieve balanced and sustainable growth using technology in a rapidly changing business environment.

## **Literature Review**

### **Ben Youssef (2025)**

Examines the concept of the Twin Transition by analysing how digital transformation pathways can accelerate sustainable innovation within organizations. The study argues that digital technologies are not merely operational tools but strategic enablers that reshape business models toward sustainability. Technologies such as artificial intelligence (AI), big data analytics, cloud computing, and smart automation systems allow organizations to monitor environmental performance, reduce resource consumption, and enhance production efficiency.

The author emphasizes that digital transformation supports sustainability in three major ways. First, it improves transparency by enabling real-time tracking of environmental indicators such as energy usage and carbon emissions. Second, it enhances innovation capacity by encouraging the development of sustainable products and services. Third, it strengthens stakeholder engagement through digital platforms that improve communication and accountability. However, the study also highlights that successful implementation requires organizational alignment, leadership commitment, and long-term strategic planning. Without proper governance, digitalization alone cannot guarantee sustainable outcomes.

**Kovacic, García Casañas, Argüelles, et al. (2024)** critically analyse the “Twin Green and Digital Transition” from a policy and socio-economic perspective. Their research questions whether the twin transition is a realistic transformation strategy or an overly ambitious political narrative. The authors argue that while policymakers

promote digitalization as a solution to climate and environmental challenges, the relationship between digital growth and sustainability is complex.

The study points out that digital technologies may contribute to environmental improvements through smart energy systems, optimized supply chains, and circular economy models. However, it also warns about potential contradictions. For instance, increased data production, expansion of digital infrastructure, and higher electricity consumption from data centres may generate additional environmental pressures. Therefore, the authors stress the importance of integrating regulatory frameworks, ethical considerations, and systemic change rather than relying solely on technological optimism.

Together, these studies provide a balanced understanding of the Twin Transition. While digital transformation offers powerful tools for sustainable innovation, its effectiveness depends on responsible governance, institutional support, and strategic implementation. The literature suggests that organizations must adopt an integrated approach where digital strategies are intentionally aligned with environmental and social objectives to achieve long-term sustainable value creation.

**Hollander, M., & Weiner, J. (2021).** Sustainability in the Age of Digital Transformation. *Journal of Business Research*, 120, 157-165.

This paper examines how digital transformation is reshaping sustainability strategies across industries, highlighting key technological drivers such as IoT, AI, and blockchain that align business goals with sustainability objectives.

The study emphasizes the need for a sustainable digital infrastructure and proposes methods to integrate digital innovations into sustainability frameworks.

**Keller, J., & Tushman, M. (2022).** Digital Innovation and Sustainability: Drivers of Organizational Change. *Journal of Technology Transfer*, 49(3), 883-902.

Explores the convergence of digital innovation and sustainability, examining the role of leadership in driving the digital transformation needed for environmental and social performance improvements. The paper argues that businesses are increasingly adopting technologies like big data and predictive analytics to make data-driven decisions, which enhance both operational efficiency and sustainability outcomes.

## **Research Methodology**

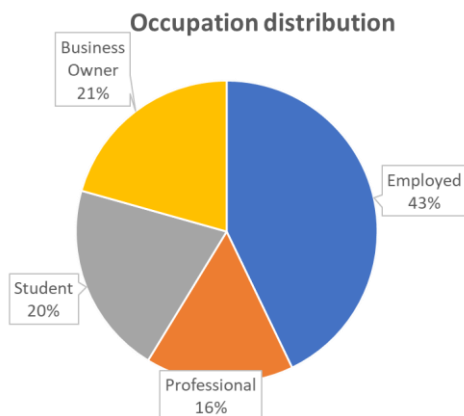
The research uses a descriptive research design to investigate the effectiveness of digital adoption and sustainability approaches within the context of the Twin Transition framework. The data was collected using a structured 20-question Google Form questionnaire to determine the extent of digital implementation and sustainability approaches. A total of 100 participants were

selected for the study using convenience sampling. The participants included students, employees, and professionals from various sectors, offering a range of insights on digital transformation and sustainability efforts.

### Research Design

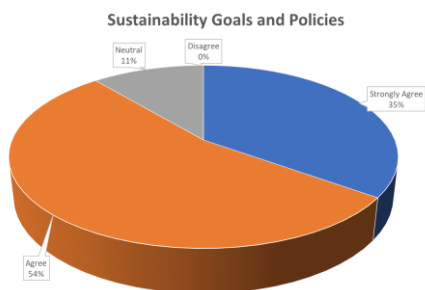
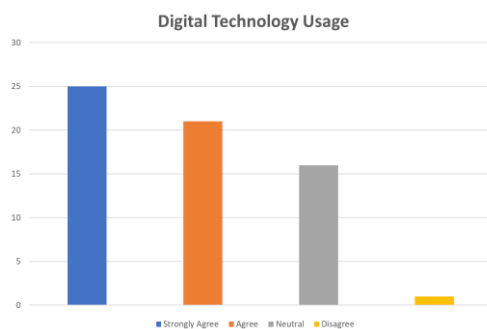
<b>Research Design</b>	Descriptive Research Design
<b>Sampling Method</b>	Convenience Sampling Method
<b>Sample Size</b>	n = 100
<b>Data Collection Method</b>	Primary Data – Structured 20-Question Google Form Questionnaire Secondary Data- Research Papers, Articles, Journals, and Published Reports
<b>Respondents</b>	Students, Employees, and Professionals from different sectors
<b>Study Focus</b>	Effectiveness of Digital Adoption and Sustainability Strategies under the Twin Transition Framework

### Analysis and Interpretation



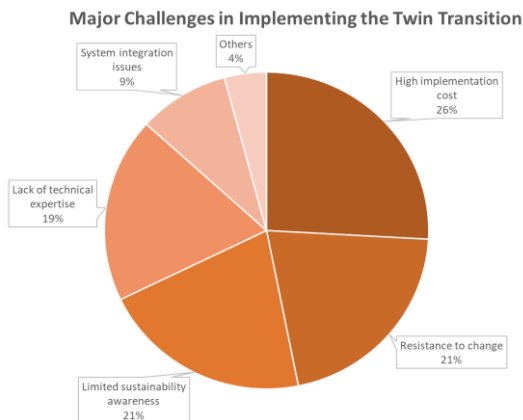
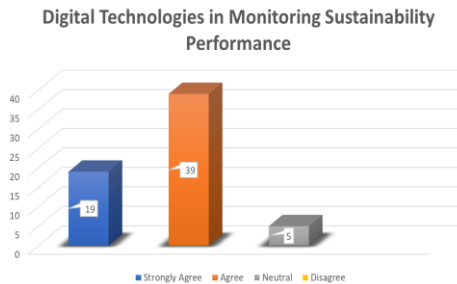
From the above chart, it is observed that employed respondents constitute the largest group (27), followed by students (13) and business owners (13), while professionals account for 10 respondents. This indicates that the majority of responses are drawn from individuals actively engaged in organizational and business environments. The diversity in occupation enhances the reliability and representativeness of the study.

From the above chart, it is clear that 34 respondents agree and 22 strongly agree that sustainability goals and policies are well established. With only 7 neutral responses and no disagreement, the findings highlight a strong institutional commitment toward sustainability practices.



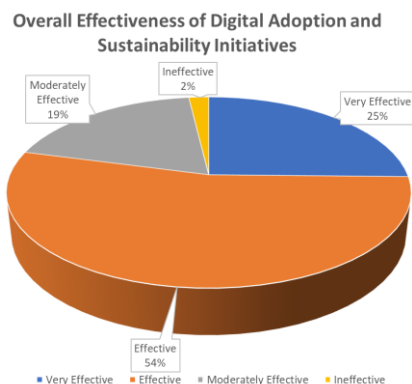
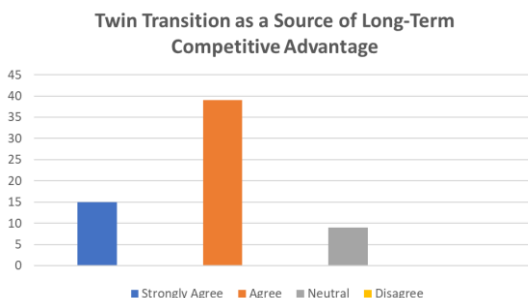
From the above chart, it is evident that 25 respondents strongly agree and 21 agree that digital technologies are effectively utilized. Only one respondent disagrees, while 16 remain neutral. This reflects a strong positive perception and widespread adoption of digital technologies within organizations.

From the above chart, it can be inferred that 39 respondents agree and 19 strongly agree that digital technologies assist in monitoring sustainability performance. Only 5 respondents remain neutral. This suggests that digital tools play a significant role in measuring and tracking sustainability outcomes.



From the above chart, high implementation cost (37 responses) emerges as the primary challenge in implementing the twin transition. Resistance to change and limited sustainability awareness (30 responses each) are also major concerns, followed by lack of technical expertise (27 responses). These findings indicate that financial and organizational barriers hinder effective transformation.

From the above chart, it is observed that 39 respondents agree and 15 strongly agree that the twin transition provides long-term competitive advantage. Only 9 respondents remain neutral. This demonstrates that organizations increasingly view digital and sustainability integration as a strategic growth driver.



From the above chart, it is evident that 34 respondents consider the initiatives effective and 16 rate them as very effective. Only one respondent perceives them as ineffective. This indicates that digital adoption and sustainability initiatives are largely successful and positively impacting organizational performance.

### **Discussion**

The findings show high levels of technology adoption and well-established sustainability goals within organizations. Most of the respondents see digital transformation as a means to support sustainability goals effectively. This is consistent with existing literature on digitalization as a strategic enabler for sustainable innovations.

The majority also agree on the long-term benefits for gaining a competitive advantage through the twin transition. Digitalization is recognized for enhancing transparency, efficiency, and monitoring performance. This reflects a strategic link between digitalization and sustainability goals.

However, high implementation costs, change resistance, and lack of expertise are major challenges identified for digital transformation.

## **II. CONCLUSION**

The study concludes that the Twin Transition is a comprehensive strategic approach that transforms how businesses function and compete, rather than just being a technological advancement or an environmental initiative. The long-term advantages greatly exceed these difficulties, even though the early phases require significant organizational alignment, cultural transformation, and financial investment. Organizations can increase operational efficiency, strengthen their resilience to future uncertainties, and stay ready for changing regulatory requirements by combining digital transformation with sustainability goals. The successful integration of digital technologies with sustainability strategies ultimately boosts competitiveness and promotes sustainable value creation, setting up businesses for long-term success in this rapidly changing world.

### III. REFERENCES

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