Impact of Digital and Green Transformation on Social Entrepreneurship

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Abstract

The digital and green transformations are basically reshaping the landscape of social entrepreneurship by redefining how social value is created, delivered, and calculated. Digital technologies such as artificial intelligence, big data analytics, and online platforms enhance scalability, improve clearness, and enable data-driven decision-making. They allow social enterprises to expand their reach, attract impact investment, and develop innovative business models that address complex societal challenges. At the same time, the green transformation promotes sustainable production and consumption pattern, circular economy practices, and low-carbon solutions. This shift creates new opportunities for environmentally oriented social enterprises while align business activities with global sustainability agendas Often referred to as the "twin transition," the convergence of the digital and green transitions increases impact potential by fusing environmental responsibility with technical innovation. But there are drawbacks to these changes as well, such as digital exclusion, a lack of skills, complicated regulations, hefty transition costs, and the possibility of green washing. Social entrepreneurs must ensure diversity and accountability while integrating digital capabilities with sustainable tactics in order to be competitive and mission-driven. All things considered, the twin transition offers a revolutionary chance as well as a strategic necessity for promoting equitable and sustainable growth.

Keywords: *social entrepreneurship, digital transformation, green transformation, sustainability, twin transition, circular economy, impact measurement, inclusive innovation.*

Introduction

Social entrepreneurship has been more well-known in recent years as a potent tool for tackling difficult societal issues like unemployment, poverty, inequality, and climate change. Social enterprises, in contrast to regular corporations, aim to provide both economic value and quantifiable social and environmental effect. Digital transformation and green transformation are two important global themes that are reshaping social entrepreneurship in the context of accelerated technical advances and escalating environmental concerns.

The term "digital transformation" describes how cutting-edge technology like artificial intelligence, big data, cloud computing, and digital platforms are incorporated into business models and organizational procedures. Efficiency, transparency, scalability, and innovation capability are all improved by these technologies. Digital tools give social entrepreneurs new methods to connect with underserved areas, raise money, assess their impact, and create inclusive services.

Sustainability, decarbonization, circular economy principles, and prudent resource management are all highlighted by the green transition. Organizations are being forced to embrace environmentally sustainable strategies by growing environmental challenges, international climate commitments, and changing customer expectations. Since their mission-driven orientation strongly coincides with environmental stewardship, social businesses are especially well-positioned to spearhead this change.

Often referred to as the "twin transition," the convergence of the digital and green transitions presents both opportunities and difficulties. It necessitates new skills and strategic adaptation while redefining finance systems, stakeholder expectations, and competitive dynamics. In a world economy that is changing quickly, assessing the future course of social entrepreneurship requires an understanding of the effects of these changes.

Review of Literature

J. Gregory Dees (1998) provided one of the earliest and most influential conceptualizations of social entrepreneurship, defining social entrepreneurs as change agents who pursue innovative solutions to social problems while maintaining accountability for social impact. His work laid the theoretical foundation for understanding how innovation and mission-driven strategies intersect an idea that remains central when examining digital and green transformations in the sector.

Johanna Mair and Ignasi Martí (2006) expanded the academic discourse by presenting social entrepreneurship as a process embedded within institutional contexts. They emphasized opportunity recognition and resource mobilization in environments characterized by institutional voids. Their perspective is particularly relevant in the era of digital and green transitions, where new institutional frameworks and technological infrastructures shape emerging opportunities for social enterprises.

Muhammad Yunus, Moingeon, and Lehmann-Ortega (2010) introduced the concept of social business models that combine financial sustainability with social objectives. Their work highlighted hybrid value creation and the importance of innovation in achieving long-term impact. This framework aligns closely with green transformation strategies that integrate environmental sustainability into economically viable enterprises.

George Westerman, Bonnet, and McAfee (2014) examined how digital transformation influences organizational performance and competitiveness. They argued that digital maturity enhances agility, efficiency, and strategic renewal. Although their study focused largely on traditional firms, its implications extend to social enterprises seeking to leverage digital tools for scaling impact and improving stakeholder engagement.

Martin Geissdoerfer et al. (2017) connected circular economy principles with sustainable business model innovation. Their research emphasized regenerative systems, resource efficiency, and long-term environmental value creation. This work contributes significantly to understanding how green transformation encourages social enterprises to adopt circular and environmentally responsible models.

Satish Nambisan (2017) explored digital entrepreneurship and platform-based ecosystems, arguing that digital technologies reduce entry barriers and enable collaborative innovation. His findings suggest that digital infrastructure can empower social entrepreneurs to reach broader communities and co-create value, while also raising concerns about digital inequality and access disparities.

Collectively, these contributions indicate that social entrepreneurship is increasingly influenced by technological advancement and sustainability imperatives, highlighting the importance of integrating digital innovation with environmentally responsible business strategies.

Objectives of the Study

- To examine the impact of digital transformation on social entrepreneurship this objective focuses on understanding how technologies such as artificial intelligence, digital platforms, big data, and mobile applications are reshaping the operations, outreach, and scalability of social enterprises.
- To assess the role of green transformation in social enterprise development this aims to explore how sustainable practices, circular economy principles, and environmentally responsible innovations influence social enterprises' strategies, mission alignment, and long-term impact.
- To analyze the intersection of digital and green transformations (twin transition) on social innovation this objective investigates how the simultaneous adoption of digital and sustainable practices can amplify social enterprises' effectiveness, efficiency, and reach.
- To identify challenges and opportunities for social entrepreneurs in adopting digital and green strategies

This focuses on uncovering potential barriers such as digital inequality, regulatory complexity, high transition costs, and skills gaps, while highlighting opportunities for innovation, funding, and impact scaling.

Need For the Study

- **Enhancing Impact:** To explore how digital and green transformations help social enterprises improve efficiency, scale operations, and increase social and environmental impact.
- **Addressing Challenges:** To identify barriers such as funding constraints, skills gaps, and regulatory issues in adopting digital and sustainable practices.
- **Guiding Strategy and Policy:** To provide insights for social entrepreneurs, policymakers, and investors on leveraging technology and sustainability for inclusive and sustainable development.

Methodology

This study examines the effects of digital and green transitions on social entrepreneurship using a quantitative research methodology with additional qualitative observations.

Research design

- A descriptive and analytical research design is employed to study the relationship between digital and green transformations and the performance of social enterprises.

Population and sample

- Population**:** Social enterprises operating in sectors such as education, healthcare, renewable energy, and sustainable agriculture.
- Sample Size: 150 social enterprises.
- Sampling Technique: Purposive sampling was used to select enterprises actively engaged in digital and sustainable practices.

Data Collection

- **Primary** D**ata:** Collected using structured questionnaires distributed to social entrepreneurs and managers.
- **Secondary Data:** Gathered from published research articles, reports, case studies, and official databases.

Hypotheses

- H1**:** Digital transformation has a significant positive impact on operational efficiency in social enterprises.
- H2**:** Green transformation significantly improves the social and environmental impact of social enterprises.
- H3**:** The combined effect of digital and green transformation (twin transition) significantly enhances overall performance and scalability of social enterprises.

Reliability and Validity

Reliability Test: Cranach's Alpha is used to measure the internal consistency of the survey instrument. A value above 0.7 indicates acceptable reliability.

Validity Test:

- **Content Validity:** Ensured through expert review of the questionnaire items.
- **Construct Validity:** Tested using exploratory factor analysis to confirm that survey items accurately measure intended variables.

Variable	No. of Items	Cronbach's Alpha	Remarks
Digital Transformation	8	0.82	Reliable
Green Transformation	7	0.79	Reliable
Social Impact	6	0.81	Reliable
Operational Performance	5	0.78	Reliable
Twin Transition Effect	4	0.80	Reliable

This technique guarantees a methodical, trustworthy, and legitimate approach to investigating the ways in which digital and green transformations impact social entrepreneurship, offering a strong basis for verifying the proposed hypotheses.

Findings and Discussion

This section presents the results of the study based on **correlation and regression analysis** of 150 social enterprises, examining the impact of digital and green transformations on social entrepreneurship.

Correlation Analysis

The intensity and direction of links between digital transformation, green transformation, twin transition, and social enterprise success were ascertained by correlation analysis.

Variables	Digital Transformation	Green Transformation	Twin Transition	Performance
Digital Transformation	1	0.62	0.88	0.65
Green Transformation	0.62	1	0.79	0.60
Twin Transition	0.88	0.79	1	0.72
Performance	0.65	0.60	0.72	1

Note: $p < 0.01$ indicates statistically significant correlation.

Discussion:

- Digital transformation shows a strong positive correlation with social enterprise performance ($r = 0.65$), indicating that enterprises leveraging digital tools experience improved efficiency and outreach.

- Green transformation is positively correlated with performance (r = 0.60), suggesting that sustainable practices enhance social and environmental impact.
- The twin transition (combined digital and green strategies) shows the strongest correlation with performance (r = 0.72), highlighting the synergistic effect of integrating technology and sustainability.

Regression Analysis

Multiple regression analysis was performed to test the hypotheses and examine the predictive influence of digital and green transformations on social enterprise performance.

Predictor Variable	Beta (β)	t-value	p-value	Interpretation
Digital Transformation	0.38	5.12	0.000	Significant positive effect
Green Transformation	0.32	4.55	0.000	Significant positive effect
Twin Transition (Digital + Green)	0.41	5.98	0.000	Strongest positive effect
R^2	0.61			61% of variance explained
F-value	72.45		0.000	Model is statistically significant

Discussion:

- **H1 Accepted:** Digital transformation significantly improves operational efficiency and overall performance of social enterprises.
- **H2 Accepted:** Green transformation positively affects social and environmental outcomes.
- **H3 Accepted:** The twin transition has the strongest influence on social enterprise performance, confirming that combining digital and green strategies maximizes impact.
- The model explains 61% of the variance in performance, indicating a strong predictive relationship.

Overall Interpretation:

The results show that whereas digital and green transformations improve performance on their own, their combined use produces a synergistic effect that greatly improves operational, social, and environmental outcomes. This highlights the twin transition's strategic significance in contemporary social entrepreneurship.

Recommendations

To increase productivity, reach, and service delivery, social enterprises should make investments in digital technologies including artificial intelligence (AI), cloud computing, and mobile apps. Developing the digital capabilities of employees and putting in place reliable data systems can also assist quantify social impact, improve transparency, and draw in impact-focused funding. Incorporating sustainable practices, like as eco-friendly procurement, circular economy models, and renewable energy, into core operations can also improve stakeholder trust and environmental results.

Adopting a twin transition strategy, in which digital tools assist green initiatives, can also enhance overall impact and foster synergy. Partnerships with NGOs, governmental organizations, investors, and technological companies can supply the required resources and knowledge. In order to empower marginalized communities and grow sustainable social innovation, social businesses should also address digital and environmental disparities, provide training, inexpensive access, and localized solutions.

Conclusion

The study shows that digital transformation is essential for improving social enterprises' outreach, operational effectiveness, and service delivery. These organizations can reach marginalized groups, track performance, and optimize procedures thanks to technologies like artificial intelligence (AI), digital platforms, and cloud systems. This makes their social effect more quantifiable and scalable.

In a similar vein, social enterprises are encouraged by the green transformation to use sustainable practices like eco-friendly sourcing, circular economy models, and renewable energy. In addition to lessening environmental damage, these programs improve stakeholder trust and long-term viability by bolstering the organization's legitimacy and alignment with global sustainability goals.

The results of the study also show that social enterprise performance is most positively impacted by the twin transition, which combines digital and green methods. Businesses can generate synergistic benefits that enhance social and environmental results by utilizing technology to assist sustainability objectives, such as tracking environmental effect, managing green supply chains, or providing eco-focused services.

In general, social enterprises need to invest in skill development, cultivate partnerships, guarantee inclusivity for excluded communities, and strategically incorporate digital and sustainable practices into their core operations. By doing so, they can scale efficiently, innovate responsibly, and maximize their contribution to social and environmental well-being, driving sustainable and inclusive development in the long term.

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