ASSESSING THE IMPACT OF DIGITAL SUSTAINABILITY ON INCLUSIVE ECONOMIC GROWTH: A COMPREHENSIVE REVIEW

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Abstract:

This study investigates the potential of digital sustainability in fostering inclusive economic growth through a systematic literature review of 150 studies published from 2002 to 2023. Through a rigorous content analysis, we identified 28 highly relevant studies illustrating how digital technologies can bridge socioeconomic divides, enhance access to resources, facilitate job creation and skill development, and improve urban planning, ultimately fostering a more supportive and inclusive societal ecosystem. However, a notable gap persists: the economic inclusive effects of digital sustainability are still underrepresented in existing literature. This underscores the necessity for a targeted research agenda to define theoretical frameworks and actionable managerial strategies that align digital sustainability efforts with inclusive growth goals. We advocate for future research to prioritize understanding the mechanisms enabling effective outcomes and evaluating long-term impacts, ultimately contributing to a more equitable digital economy.

Keywords: *Digital sustainability, Inclusive economic growth, Digital technologies, Systematic Literature Review, Content analysis*

JEL classification: *O32, O33, D63*

Introduction

In the contemporary era, digital technologies have become essential drivers of economic and social development, shaping various aspects of daily life, business operations, and governance structures. The concept of digital sustainability has emerged as a framework that emphasizes the responsible and equitable use of digital technologies to promote environmental protection and social inclusivity (Floridi, 2020; Radu, 2023). This approach aims to ensure that rapid advancements in digital tools and platforms contribute positively to sustainable development goals (SDGs), particularly by fostering inclusive economic growth (United Nations, 2022).

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Inclusive economic growth refers to an expansion of economic activity that is equitably distributed across society, providing opportunities for all individuals to participate in and benefit from economic progress (World Bank, 2021). Participate in the economic progress means “that the effort to advance a country’s growth and development should be produced with the contribution of all citizens without excluding an important group of the society” (Cabeza- García et al., 2018), as women or marginalized communities. Benefit from economic growth implies delivering progress to society as a whole, which means that “the benefits of increased prosperity and productivity are shared more evenly between people and translate into an increase in well-being across society” (Brys et al., 2016).

The integration of digital technologies across various sectors holds significant potential to bridge socioeconomic divides, improve access to essential services, and create new opportunities for employment and skills development (OECD, 2023). Existing research highlights how digital technologies, such as artificial intelligence (AI), big data, blockchain, and the Internet of Things (IoT), can drive sustainability and economic progress (European Commission, 2022; Gholami et al., 2023). For instance, mobile banking and digital financial platforms have facilitated financial inclusion for marginalized communities, particularly in developing economies, by offering access to banking services where traditional financial infrastructure is lacking (Demirgüç-Kunt et al., 2022). However, as Daud et al. (2023) emphasize, achieving widespread financial inclusion through digital solutions remains challenging due to multiple structural barriers, including inadequate financial infrastructure, cultural and social constraints, disparities in financial literacy, and systemic exclusions based on demographic factors such as race, gender, and socioeconomic background. Addressing these obstacles requires targeted policies and digital innovations that ensure equitable access to financial services.

Beyond financial inclusion, digital transformation has also enhance access to education and skills development through online learning platforms and digital training programs, which have been particularly effective in bridging educational gaps in underserved regions (Gottschalk and Weise, 2023). Moreover, the expansion of e-commerce and digital entrepreneurship has enabled small and medium-sized enterprises (SMEs) to reach broader markets, reducing entry barriers for women and minority-owned businesses (Gloria et al., 2017). Additionally, remote work and digital labor platforms have created new employment opportunities for individuals in rural areas and for those facing mobility constraints, such as persons with disabilities (ILO, 2023). Similarly, smart cities and digital governance initiatives have optimized urban planning, reduced energy consumption, and improved public service accessibility, enhancing economic opportunities in both urban and rural contexts (Shao and Min, 2025).

However, the relationship between digital sustainability and inclusive economic growth remains complex and requires a more systematic examination (Zuboff, 2019). While numerous studies have examined the environmental benefits of digital technologies (GeSI, 2021) or their impact on economic expansion in general (Brennen & Kreiss, 2016), relatively few have explicitly explored how these technologies contribute to reducing income disparities or enhancing economic participation (Ferrari and Salazar, 2022). This gap limits our understanding of the mechanisms through which digital sustainability can be leveraged to foster more fair economic opportunities.

The present study aims to address this gap by systematically reviewing existing literature on the concept of digital sustainability. By analyzing 150 studies published between 2002 and 2023, we identify key pathways through which digital technologies support an equitable growth and highlight critical areas that require further empirical and theoretical investigation. In particular, this study focuses on: i) the role of digital technologies in bridging socioeconomic divides, with a focus on access to financial, healthcare, and educational resources; ii) the contribution of digital sustainability to job creation and workforce

development, especially in the context of upskilling and reskilling for the digital economy; iii) the impact of smart cities and digital infrastructure on urban inclusivity, examining how digital planning tools improve economic opportunities for marginalized populations; iv) the need for managerial and policy frameworks that align corporate digital sustainability strategies with inclusive growth objectives.

Additionally, the study provides a foundation for future studies that seek to develop theoretical models and actionable managerial strategies that ensure digital transformation initiatives are aligned with broader social and economic inclusion goals (Gurumurthy & Chami, 2021).

Description of the Problem

The rapid expansion of digital technologies has revolutionized economies worldwide, significantly impacting various sectors, from finance to healthcare and education. While digital transformation has created new opportunities, it has also raised concerns regarding its role in exacerbating existing socioeconomic inequalities. Digital divides persist across various demographic groups, particularly affecting marginalized communities in low-income regions (Demirgüç-Kunt et al., 2022). Limited access to digital tools and connectivity exacerbates economic exclusion, reinforcing systemic inequalities and restricting upward mobility. Despite increasing global internet penetration, disparities in digital access and affordability remain significant barriers to inclusive growth (World Bank, 2021).

The digital divide manifests in multiple dimensions, including infrastructural, economic, and cognitive barriers (van Dijk, 2020). A lack of broadband infrastructure in rural and underserved areas prevents equal participation in the digital economy (Robinson et al., 2015), while affordability constraints disproportionately affect lower-income populations, limiting their ability to benefit from digital financial services and e-learning platforms (Galperin & Viecens, 2017). Additionally, disparities in digital literacy further entrench social stratification, as individuals without adequate digital skills face challenges in accessing online opportunities for employment and education (Lutz, 2019).

Moreover, the intersection of digital exclusion with existing social inequalities—such as gender, ethnicity, and disability—creates compounded disadvantages (Ragnedda & Muschert, 2018). Women, particularly in developing economies, encounter structural barriers to digital access due to cultural norms, lower financial autonomy, and limited participation in STEM education (Hilbert, 2011). Similarly, linguistic and accessibility barriers restrict digital participation for minority groups and individuals with disabilities (Goggin, 2020). Addressing these disparities requires multi-stakeholder collaboration, where governments, private sector actors, and civil society organizations work together to implement policies that promote equitable digital access and skills development (UNESCO, 2022).

While initiatives such as community-based internet access programs, affordable digital devices, and targeted digital literacy training have demonstrated positive impacts (Napoli & Obar, 2014), systemic interventions are needed to ensure that digital sustainability does not exacerbate existing socioeconomic inequalities. Policymakers and businesses often prioritize short-term gains over long-term inclusivity, leading to digital strategies that fail to address systemic inequalities (Brennen & Kreiss, 2016; Radu, 2023). Bridging the digital divide must go beyond infrastructural expansion to include regulatory frameworks that support fair digital labor markets, data protection policies that safeguard marginalized communities, and inclusive digital governance structures that amplify diverse voices in decision-making (Eubanks, 2018).

Digital sustainability, which emphasizes the responsible use of digital technologies to support

environmental, social, and economic well-being, presents a potential pathway to addressing these disparities. However, these aspects remain insufficiently explored, both in theory and practice (Gholami et al., 2023; OECD, 2023).

Challenges in Defining and Measuring Digital Sustainability

One of the primary issues surrounding digital sustainability is its conceptual ambiguity. Scholars and policymakers have provided varying definitions, often focusing on environmental impacts, such as reducing carbon footprints and improving energy efficiency (GeSI, 2021; European Commission, 2022). However, as Covucci et al. (2024) demonstrate through an in-depth systematic review of the literature on digital sustainability, two dominant perspectives emerge: one that focuses on the preservation of digital resources for future generations (Bradley, 2007) and another that emphasizes the role of digital technologies in advancing sustainable development goals (George et al., 2021; Sparviero and Ragnedda, 2021). While much of the literature on digital sustainability has focused on its environmental dimension, particularly in relation to climate change mitigation and resource efficiency (Pan et al., 2022), its social and economic implications remain significantly underexplored (Covucci et al., 2024). The social dimension has largely been examined through a sociological lens, emphasizing issues such as digital literacy, the digital divide, and digital inclusion (Sá et al., 2021). However, the economic dimension has received limited scholarly attention.

Existing research predominantly examines the broader economic benefits of digitalization, such as increased productivity and efficiency gains. However, there is a notable gap in studies specifically investigating how digital sustainability contributes to inclusive economic growth. While some research highlights the potential of digital technologies to generate employment and enhance workforce skills (Ferrari and Salazar, 2022), it rarely considers how these benefits are distributed across different socioeconomic groups or whether they help reduce structural economic inequalities.

To fully realize its potential, digital sustainability must go beyond ecological concerns and actively promote equitable access to digital infrastructure, foster digital skills development, and create economic opportunities for all. This requires recognizing the complex interplay between governments, institutions, and the broader public in shaping policies and initiatives that ensure digital sustainability supports fair advancements (UN-Habitat, 2023; United Nations, 2022).

By analyzing relevant academic contributions, we aim to clarify how digital sustainability initiatives can serve as catalysts for reducing socioeconomic disparities. The findings of this study will provide valuable insights for scholars, policymakers, and business leaders striving to create a more equitable digital economy.

Methodology and Data

To ensure the rigor and validity of our study, we employed a systematic literature review (SLR) methodology, which allows for a structured and replicable synthesis of existing research. This approach is particularly useful for consolidating knowledge in emerging fields like digital sustainability and inclusive economic growth, where fragmented and interdisciplinary studies require a comprehensive assessment (Tranfield et al., 2003).

Literature selection process

The literature review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework (Welch et al., 2012), ensuring transparency and

reproducibility. The PRISMA guidelines were applied at every stage, including study identification, screening, eligibility assessment, and final inclusion. To reduce bias, all selection steps were documented, and discrepancies were resolved through discussion between researchers.

We conducted a comprehensive search of relevant studies on "digital sustainability" using two of the major academic databases: Scopus and Web of Science (Core collection). The search covered the period from 2002—when the concept of digital sustainability started gaining traction—to 2023. To refine our selection, we applied the following inclusion criteria:

- Peer-reviewed journal articles, conference proceedings, and book chapters;
- studies written in English to ensure accessibility and comparability;
- research explicitly addressing digital sustainability, with a focus on its relationship to inclusive economic growth.

The final dataset contained 150 studies. After an initial screening of titles and abstracts, 68 papers were shortlisted for full-text analysis. Among these, the studies were excluded if they lacked empirical or theoretical depth, were duplicates and focused predominantly on environmental sustainability without discussing economic inclusivity.

Thematic analysis and coding process

The thematic analysis was conducted by two independent researchers to enhance objectivity and reliability. Both researchers independently coded the studies, classifying them as either "relevant" or "non-relevant" based on their consideration of digital sustainability's role in fostering inclusive growth. A study was deemed relevant not only if it explicitly discussed mechanisms through which digital sustainability contributes to economic inclusion, but also if its findings allowed for implications to be drawn in this regard. Even when the primary focus of a study was not directly on this relationship, it was included if its results provided meaningful insights for understanding it. Disagreements between researchers were resolved through iterative discussion to ensure consensus and minimize subjective bias.

Data Extraction and analysis

To facilitate the analysis and coding process, we used NVivo, a qualitative data analysis software that supports systematic classification and retrieval of text-based data. NVivo was employed to categorize key themes, identify patterns across studies, and ensure consistency in coding decisions. The software's query functions enabled us to cross-check coding accuracy and assess agreement levels among the three researchers. To evaluate inter-rater reliability, we calculated Cohen's kappa, which resulted in a value of 0.75, indicating substantial agreement.

We extracted key information from the selected studies, including research objectives, methodologies, key findings, and identified gaps. To ensure robustness, we conducted a cross-validation process, comparing and synthesizing findings across different studies. Ultimately, 28 studies were deemed highly relevant based on their contribution to understanding the intersections between digital sustainability and inclusive economic growth, either through direct discussion or inferred implications.

Results

Digital sustainability plays a critical role in fostering inclusive economic growth by leveraging technological advancements to bridge gaps in accessibility, participation, and long-term value creation across multiple sectors. Various studies within the reviewed dataset are demonstrating how digital technologies contribute to resilient and equitable development.

Abaku et al. (2021) highlight how Estonia's e-Residency program exemplifies the potential of digital sustainability in economic inclusion by providing entrepreneurs from developing countries with access to European markets. Similarly, Erturk & Purdon (2022) illustrate how digital sustainability initiatives in New Zealand enhance digital inclusion for lower-income groups, thereby improving employability and economic participation. The role of sustainable digital entrepreneurs is also explored by Isensee et al. (2023), who identify resilience factors that allow startups and SMEs to integrate sustainability into their business models, reinforcing the link between digital innovation and economic viability.

In urban development, Canesi and Marella (2022) propose digital sustainability indicators for measuring economic resilience in marginalized regions, while Pee and Pan (2022) investigate how digitally-enabled climate-smart cities drive economic transformation through new job creation and innovation in green and digital sectors. These insights align with findings from Zhang et al. (2022), who explore the role of big data in smart city initiatives supporting SDG 11, emphasizing how data orchestration enhances sustainable urban development and inclusive growth. Xing and Li (2010) further contribute to this discussion by demonstrating how urban design, viewed through a digital and ecological lens, fosters inclusive economic growth by integrating social, environmental, and economic factors in urban planning.

From a business perspective, Hidiroğlu (2022) discusses how digital sustainability drives competitive advantages by optimizing internal processes and fostering innovation. This aligns with Bencsik et al. (2023), who analyze business models for digital sustainability in smart city services, and Verma et al. (2024), who examine the potential of emerging digital technologies—such as AI, IoT, and blockchain—in addressing sustainability challenges while fostering economic opportunities. Furthermore, Busch (2011) underscores the importance of corporate responsibility in bridging digital divides, ensuring that digital sustainability extends beyond business efficiency to address social equity. The study by Human and Kazzazi (2021) on digital consent highlights the ethical considerations in digital regulations, reinforcing the importance of responsible data practices in creating a sustainable digital economy that promotes equitable access and participation.

The financial sector also benefits from digital sustainability, as demonstrated by Cokçetin (2017), who explores its role in financial inclusion by improving accessibility for the unbanked. Similarly, Bruneckiene et al. (2019) employ AI and neural networks to assess investment attractiveness, linking digitalization with economic competitiveness. The broader implications for multinational enterprises are considered by the study on digital transformation, sustainability, and purpose in MNEs, which highlights how businesses navigate technological advancements while aligning with stakeholder expectations.

In agriculture, digital sustainability ensures equitable access to technological advancements. Marinello et al. (2019) introduce the Digitization Footprint as a measure of digital resource usage, ensuring technological benefits are equitably distributed. Sacco et al. (2021) further examine the economic implications of digital agriculture, emphasizing the role of ICT solutions in rural development. Kruk et al. (2021) extend this discussion by exploring digital governance models that enhance smallholder participation in sustainable food production, reinforcing the potential of digital sustainability in democratizing economic benefits in agriculture.

The industrial sector benefits from digital sustainability through enhanced transparency and circular economy initiatives. Mogos and Fragapane (2022) highlight how blockchain-based assessments ensure sustainability in textile and clothing value chains, promoting inclusive and ethical economic practices. Wurster and Reis (2022) explore recommendation software supporting sustainability-oriented product decisions, aligning with EU circular economy goals. Meanwhile, Bajic et al. (2023) investigate human-centric Industry 5.0 frameworks, demonstrating how optimized digital processes improve job opportunities and working conditions. The study by Gervasi et al. (2022) further emphasizes the role of digitalization in cultural heritage management, showing how technological advancements can promote local tourism and economic recovery, particularly in regions reliant on heritage-driven economies.

Governance models integrating digital sustainability principles also influence global value chains. Kruk et al. (2024) explore digital sustainability assurance mechanisms in aquaculture, illustrating how governance innovations promote inclusive participation in sustainable economic activities. Braun et al. (2022) examine the role of digital transformation in construction, linking resource efficiency with economic sustainability.

Education is another crucial area where digital sustainability fosters long-term economic inclusivity. AlDhaen (2023) and Lampoltshammer et al. (2021) emphasize the importance of integrating digital sustainability into business education, preparing future leaders to incorporate sustainability into economic strategies. By ensuring that knowledge transfer includes sustainability principles, these studies reinforce the long-term potential of digital literacy in shaping an inclusive and sustainable economy. Skulimowski (2019) adds to this perspective by examining the strategic planning of AI-based learning platforms, demonstrating their role in fostering educational accessibility in knowledge-based societies.

The intersection of digital sustainability and health is also significant, as shown by McBride et al. (2020), whose study on smartphone apps for hypertension management illustrates how digital tools improve health outcomes and workforce productivity, further reinforcing the link between health equity and inclusive economic progress. Finally, Ciacci et al. (2024) provide a comprehensive framework for measuring digital sustainability through the Digital Development Index (DDI), demonstrating how digital transformation intersects with economic, social, and environmental dimensions across European countries. Their findings reveal disparities in digital sustainability, particularly between Western and Northern Europe and other regions, emphasizing the need for targeted policies to bridge these gaps.

Across these diverse contributions, three dominant perspectives emerge in assessing how digital sustainability contributes to a more equitable economy First, digital technologies play a key role in bridging socioeconomic divides, as evidenced by studies on digital financial inclusion (Cokçetin, 2017), e-Residency programs (Abaku et al., 2021), and corporate responsibility in closing digital gaps (Busch, 2011). Second, the link between digital sustainability and job creation, workforce transformation, and skill development is evident in research on smart city innovations (Pee & Pan, 2022; Zhang et al., 2022), digital entrepreneurship (Isensee et al., 2023), and human-centric Industry 5.0 frameworks (Bajic et al., 2023). Finally, digital sustainability contributes significantly to improving urban planning and infrastructure, as demonstrated by studies on sustainable urban design (Canesi & Marella, 2022), big data-driven urban solutions (Zhang et al., 2022), and governance models for resilient cities (Braun et al., 2022). These three perspectives offer an integrated framework for analyzing how digital sustainability fosters equitable and lasting economic development.

Conclusions

The findings of this study underscore the transformative potential of digital sustainability in fostering inclusive economic growth through three interconnected pathways: bridging socioeconomic divides, facilitating job creation and skill development, and enhancing urban

planning and infrastructure. By leveraging digital technologies, marginalized communities gain access to essential services, financial opportunities, and educational resources, reducing structural inequalities. Simultaneously, the rise of sustainable digital entrepreneurship and green technologies creates new employment prospects, emphasizing the need for workforce adaptation and continuous learning. Additionally, smart city initiatives demonstrate how data-driven governance can optimize urban resilience, making infrastructure more efficient and inclusive. However, while digital sustainability presents vast opportunities, its success depends on equitable policy frameworks, ethical governance, and targeted interventions that address existing disparities.

Despite these promising insights, the body of literature directly addressing the influence of digital sustainability on an inclusive economic growth remains relatively limited given the significance of the topic. This highlights the need for a more targeted research agenda aimed at defining robust theoretical frameworks and actionable managerial strategies in this direction.

Future Directions

Future research should focus on developing theoretical frameworks that clarify how digital sustainability interacts with economic inclusion, addressing factors such as equitable access to digital infrastructure, digital literacy, and the role of digital platforms in reducing socioeconomic disparities. Empirical studies are needed to examine the mechanisms through which digital sustainability initiatives drive inclusive growth, including longitudinal analyses of digital upskilling programs, case studies on sustainable digital entrepreneurship, and sector-specific investigations into job creation, particularly for marginalized populations. Additionally, research should explore how regulatory frameworks and business strategies can align digital sustainability efforts with inclusive economic outcomes, assessing the effectiveness of digital inclusion policies and corporate strategies that integrate sustainability into digital business models. This research agenda should prioritize interdisciplinary approaches that integrate technological, economic, and social perspectives, ultimately contributing to a more equitable and sustainable digital economy.

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