

A systematic Literature Review: Technology Digital and ESG

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Abstract

Introduction/Main Objectives: This study aims to analyze the relationship between digital technology and ESG performance using the Systematic Literature Review (SLR) method from previous studies in the last decade. **Background Problems:** This convergence of technological innovation, ESG performance, and responsive policies creates a new business paradigm. However, understanding the impact of digital technology on ESG performance remains limited. **Novelty:** this article is to explore the relationship between digital technologies and ESG, thereby providing a state-of-the-art research overview on the topic. **Research Methods:** This research adopted the systematic literature review (SLR) methodology to examine the influence of digital technology on ESG performance in the last 10 years (2015-2025) from leading international databases. The SLR process involved three main stages: planning the review, applying screening criteria, and analyzing the review. **Finding/Results:** Over the past decade, research on digital technology and ESG has shown a positive impact on performance, particularly in the face of global challenges like COVID-19. Technologies like Industry 5.0, green innovation, and digital inclusive finance strengthen ESG reporting. The Stakeholder Theory is widely used, emphasizing stakeholder interests in sustainable decision-making. **Conclusion:** Future studies on how digital technology affects ESG performance ought to incorporate viewpoints from a variety of stakeholders, such as investors, customers, and legislators. The AIESG Protocol can encourage transparency, and dual materiality can improve ESG performance. Investment in digital infrastructure and qualitative methods must be combined for post-pandemic adaption.

Keywords: ESG; Performance SDGs; Technology digital

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INTRODUCTION

The concept of Environmental, Social, and Governance (ESG) has developed into a fundamental strategic framework for companies in facing the increasingly complex challenges of globalization and digital transformation. The three main pillars of ESG, namely; environmental, social, and governance not only represent the company's commitment to sustainability issues, but also serve as indicators of corporate social responsibility in the context of the modern economy (Pulino et al., 2022; Broccardo et al., 2023; Handoyo & Anas, 2024; Yong et al., 2024; Yu et al., 2024). The environmental pillar includes efforts to mitigate climate change and manage natural resources, while the social aspect involves relationships with stakeholders, workers' rights, and inclusiveness.

Governance refers to the transparency of company policies, accountability of the board of directors, and prevention of corruption.

ESG can also mitigate the risks that occur from the policies that companies take (Broadstock et al., 2021; Pulino et al., 2022; Yong et al., 2024; Yu et al., 2024). These findings align with academic explorations over the past decade that confirm that ESG practices not only reduce financing barriers through increased transparency and investor confidence, but also strengthen corporate governance and create long-term economic value through competitiveness and adaptation to global market dynamics (Albuquerque et al., 2019; Li Wang & Yang, 2024; Truant et al., 2024). Many countries require ESG reporting, including the European Union (Koundouri et al., 2022), the United States (Christensen et al., 2021; Coates, 2021), New Zealand (Ding et al., 2018), India (Singh et al., 2018), and several countries in Southeast Asia (Putri et al., 2025)

The development of the digital era has also influenced the evolution of ESG, where technological transformation is leveraged to optimize environmental impact measurement, increase social participation through digital platforms, and strengthen data-driven governance systems (Niu et al., 2022; He & Chen, 2024; Wu et al., 2024; Xu & He, 2025). This digitalized ESG not only accelerates the decision-making process, but also facilitates collaboration among stakeholders in achieving sustainability goals. As such, ESG has transformed from a mere compliance framework to a strategic instrument that drives business innovation and resilience amid global disruption. Digital technology has been identified as a catalytic element capable of transforming corporate environmental, social and governance (ESG) performance in the context of global awareness of the importance of sustainable development. Digital technologies such as *big data*, *artificial intelligence* and *blockchain* offer innovative solutions to optimize ESG practices. Soori et al. (2024) explains that the integration of blockchain in the *Industrial Internet of Things* (IIoT) creates a transparent and decentralized *supply chain* ecosystem. Through public and audited data records, every stage of production can be tracked for its environmental impact in real-time, while IIoT sensors and RFID tags provide accurate information about the condition of goods as well as environmental parameters. The distributed structure of blockchain reduces dependence on middlemen, minimizes operational errors, and improves logistics efficiency. In addition, this technology enables the incentivization of sustainable practices, such as reduced energy consumption or waste management, through automated *smart contract* mechanisms (Soori et al., 2024). The synergy between blockchain and IIoT not only optimizes inventory management but also strengthens compliance with sustainability standards, thus forming a resilient and environmentally oriented industrial ecosystem.

Further empirical support is provided by Zhang & Huang (2024) who found that digital transformation significantly enhances *supply chain* resilience through diversifying supplier and customer networks. This reduction in the concentration of business relationships not only mitigates operational risks but also strengthens the capacity of companies to meet ESG criteria. These findings emphasize that the adoption of digital technologies not only improves operational efficiency, but also creates a structural foundation for holistic sustainable development. Thus, the convergence between technological innovation, ESG performance, and responsive policies creates a new paradigm in business that integrates sustainability as the core of competitive strategy.



Although the potential of digital technology in improving *Environmental, Social, and Governance* (ESG) performance has been widely recognized, a comprehensive understanding of how digital technology concretely affects ESG performance in various contexts is still limited. Wang & Wang, (2025) in their research highlights that the rapid advancement of digital technology presents new opportunities as well as challenges for companies in achieving optimal ESG performance. In the context of organizations increasingly prioritizing sustainable development, an in-depth understanding of the role of digital technologies in improving ESG outcomes is crucial.

Wang & Wang, (2025) applied a *double fixed-effects* model to analyze the two paths through which digital technology adoption affects ESG performance. Using data from 35,650 Chinese listed companies over the period 2009 to 2021, Wang & Wang (2025) shows that digital technology adoption has a significant positive impact on ESG performance, both currently and in the future. Furthermore, this study identifies that the **breadth** and depth of digital technologies offer complementary approaches to improving ESG performance. Specifically, the breadth of digital technologies contributes to improved ESG performance through increased information transparency and reduced financing constraints. On the other hand, the depth of digital technologies plays an important role in supporting firms' ESG initiatives through improving operational efficiency. Wang & Wang, (2025). In addition, Wang & Wang (2025) also found that the impact of digital technologies on ESG performance varies significantly across sectors, particularly between manufacturing and highly polluting firms. The adoption of digital technologies opens up opportunities for standardization of information regarding companies' ESG ratings, which in turn can enhance accountability and transparency.

The purpose of this study is to analyze the relationship between digital technology and ESG performance through the *Systematic Literature Review* (SLR) method of previous internationally reputable studies in the last 10 years. The analyzed studies will be taken from leading databases such as Scopus, Thomson Reuters, Elsevier, Springer, Wiley, and Taylor & Francis. Furthermore, this SLR will analyze the research results, the theories used, the location of the research, the industry studied, and the measurement methods used in these studies. This analysis will provide a comprehensive picture of the relationship between digital technology and ESG performance and identify the factors that influence the relationship. In addition, the article will also discuss interesting future research directions to be explored on the topic of digital technology and ESG. Thus, this article is expected to make a significant contribution to the understanding of the role of digital technology in improving ESG performance, as well as provide valuable insights for academics, practitioners, and policymakers in optimizing the role of digital technology to achieve the global sustainability agenda.

In addition to this introduction, this article is divided into four more distinct sections. Section 2, the chosen method for conducting the research is demonstrated. In Section 3, the results of the investigation are outlined and analyzed in line with the purpose of this study, and finally, in Section 4, the researchers' considerations on the study are presented, accompanied by recommendations for future investigations.

RESEARCH METHOD

This research adopts the *systematic literature review* (SLR) methodology as the main approach to examine the influence of digital technology on *Environmental, Social, and Governance* (ESG) performance. The SLR method was chosen because of its advantages in replicating, increasing transparency, so as to minimize the subjective bias of researchers and improve the accuracy of synthesizing findings (Broccardo et al., 2023). The SLR process in this study was carried out through three main stages. The first stage, "plan the review", involved planning the review comprehensively with reference to the relevant literature. The second stage, "apply screening criteria", focuses on selecting literature that is more specific and appropriate to the research topic or theme. The final stage, "analyze the review", involves an in-depth analysis of the selected literature to identify *research gaps* that could become opportunities for future research. In this SLR exercise, a literature search was conducted using relevant keywords such as; digital technology (AI, blockchain, big data, IoT, cloud computing), ESG (sustainability reporting, environmental accounting, CSR disclosure, corporate governance), and Accounting (financial reporting, auditing, management accounting) from leading international databases such as Scopus, Thomson Reuters, Elsevier, Springer, Wiley, and Taylor & Francis. The time span of literature publication was limited to the last 10 years (2015-2025) to ensure the relevance and actuality of the data. From the selection process, 51 articles were obtained that met the inclusion criteria. In addition, for data homogeneity, only articles published in English were included in the analysis.

Plan the Review

The initial stage in plan the review begins with careful planning to collect relevant reference sources. In this study, the planning process involved identifying and retrieving literature from six internationally reputable online journal databases. To ensure a targeted literature search, a search strategy was designed by applying specific keywords tailored to the research topic. The use of these keywords aims to filter the search results to match the scope of the study, while reducing the risk of bias or irrelevance of sources. In addition, the protocol structured at this stage not only serves as a guide for conducting the review, but also serves as a foundation to ensure that the research process can be replicated in the future. This replication is important to validate findings, increase methodological accountability, and allow other researchers to conduct further testing or development based on transparent and standardized procedures.

Apply Screening Criteria

The next stage in this research is to select the literature that has been collected. This selection process was carried out by applying predetermined criteria, which aimed to ensure that the selected literature was relevant and in line with the research focus. These selection criteria include several important aspects, namely the type of publication, publication year limitation, and the language used in the literature. In the context of this research, the type of publication in focus is scientific journals. In addition, this study limited the literature used to journals published within the last 10 years, with the aim of ensuring that the information used was the most up-to-date and relevant to recent developments. Finally, this study



stipulates that the literature used must be written in English, with the aim of accessing international scholarly sources that discuss in depth the influence of digital technology on ESG (Environmental, Social, and Governance) performance. By applying these selection criteria, this study sought to ensure that the literature used was of high quality and relevance, so as to provide a solid basis for analysis and discussion.

Analyze the Review

After selecting the literature according to the predetermined criteria, the final stage in this process is to analyze the review using the review protocol as the main instrument. The review protocol serves as a systematic guide for collecting and organizing key information from the selected literature, while ensuring accurate identification of relevant sources. In this context, the structure of the review protocol was adopted and adapted from previous studies conducted by Moher et al. (2010) and Mengist et al. (2020). This approach utilizes a proven framework to enhance the validity and consistency of the analysis, thus enabling a comprehensive and purposeful review of the research objectives.

RESULTS AND DISCUSSION

Research related to ESG (Environmental, Social, Governance) performance shows complex dynamics, which are influenced by external and internal company factors. Arvidsson & Dumay, (2022) found that climate change and the COVID-19 pandemic have a negative impact on ESG performance, mainly due to operational disruption and increased regulatory risk. On the other hand, Chen et al., (2024) identified the positive impact of environmental policies (EPLs) on ESG performance, particularly in the resource, environmental, and polluting company sectors, indicating the importance of pro-environmental regulation. Industry 5.0 (Yadav et al., 2024). However, ESG performance is not only related to social contributions, but also regulatory risks, such as misalignment with evolving policy frameworks (Sætra, 2023). Internal factors such as management commitment (OPCare) have been shown to strengthen ESG initiatives, although this influence can be muted by CEO power (Mahran & Elamer, 2024).

The role of digitalization and technological transformation is a dominant theme in recent research. Digitalization of ESG (DESG) practices significantly improves brand equity and financial performance, especially in rural banks, through mediating customer loyalty and stakeholder engagement (Sarpong et al., 2023). Digital transformation was also shown to improve financial and non-financial performance during COVID-19 (Park & Ahn, 2025), as well as drive sustainable business in Islamic banks, although corporate governance did not mediate this relationship (Siswanti et al., 2024). Digital technology innovation is even associated with improved ESG performance through information transparency, green innovation, and strengthened governance (Ma et al., 2024; Ruan et al., 2024; Xie et al., 2024; Wang & Yang, 2024; Yin, 2025). However, Wang & Hou (2024) reveals that digital transformation (DT) in its early stages can actually reduce ESG performance due to cost uncertainty and operational disruption, although low earnings management can mitigate these negative effects.

Bibliometric studies by Nyantakyi et al., (2023) and Basavaraj & Prakash (2024) show an exponential growth of ESG research with a focus on sustainability and reporting, although topics such as greenwashing and climate change are still under-explored. The

majority of research comes from developed economies such as the UK, US, China and Italy, while emerging economies are underrepresented (Marie et al., 2024). Heterogeneity analysis also reveals that ESG impacts are stronger in state-owned enterprises, such as China's eastern region, and high-polluting industries (Chu et al., 2025 and Li et al., 2025). That is, research results show that digital transformation plays an important role in improving ESG performance, with significant positive effects on environmental, social, and corporate governance aspects (Chen & Wang, 2024; Wang & Yang, 2024; Xie et al., 2024). However, there are also findings suggesting that digitization can have a negative impact on ESG performance if not implemented properly, especially in the early stages (Lang Wang & Hou, 2024). In addition, other research results also highlight the importance of factors such as green technology innovation (Li & Pang, 2023; Chu et al., 2025), stakeholder engagement (Sarpong et al., 2023), and industry characteristics (Arunkumar et al., 2025) in moderating the relationship between digital transformation and ESG performance. Some studies also identify the important role of developed countries such as China, US, Italy, and UK in driving the growth of ESG research (Nyantakyi et al., 2023; Basavaraj & Prakash, 2024; Marie et al., 2024). The following is a conclusion of the research results which are divided into three parts namely; the majority of research, research gaps, and significant impact vs. insignificant impact.

Table 1 Summary of research data from 51 internationally reputable journal articles

Majority of Research	Research Gaps	Significant vs. Insignificant Impact
57.7% of research focuses on the impact of digitalization and technological transformation on ESG performance.	A total of 19.2% of the research highlighted academic gaps, such as the lack of studies on greenwashing, climate change and regional disparities.	A total of 69.2% of studies proved a significant impact

Source: data processed by authors

Based on table 1, it can be explained that 57.7% of studies focus on the impact of digitalization and technological transformation on ESG performance. This confirms that the adoption of digital technologies, such as I5.0, green innovation, and digital inclusive finance, can improve ESG transparency, efficiency, and accountability (Yadav et al., 2024 and Chen & Wang, 2024). Digital transformation is also a major catalyst in dealing with crises such as COVID-19 (Park & Ahn, 2025). Most studies show that digital transformation has a significant positive impact on ESG performance. This is achieved through increasing information transparency, green innovation, and strengthening internal control mechanisms. Digital transformation also facilitates more reliable and real-time ESG reporting, and expands the reach of reporting.

Meanwhile, 19.2% of studies highlighted academic gaps, such as the lack of studies on greenwashing, climate change, and regional disparities. Nyantakyi et al. (2023) noted that only 10% of articles discussed greenwashing, while Baratta et al. (2025) criticized the lack of research on digital access inequality in developing countries. Specific sectors such as the technology (IT) industry are also less explored, despite 56.25% of IT companies reporting

improved performance (Arunkumar et al., 2025). This means that a small number of studies highlight the potential negative impact of digital transformation on ESG performance, especially in the early stages of implementation. Challenges such as lack of internal organizational resources and digital uncertainty may hinder the effectiveness of digital transformation in improving ESG performance. In addition, there are regional disparities in access to digital and technical skills, which may affect companies' ability to adopt ESG practices.

Furthermore, 69.2% of studies prove the significant impact of factors such as digitalization, regulation, and green innovation on ESG. For example, new quality productivity improves ESG performance by 6.2% (Chu et al., 2025). However, 15.4% of the results are insignificant or negative, such as the absence of influence of corporate governance on sustainable business (Siswanti et al., 2024) or the decline in ESG due to DT in the early stage (Lang Wang & Hou, 2024). These negative impacts are often related to technological immaturity and transition costs. That is, a number of studies show that the impact of digital transformation on ESG performance is moderated by various factors, such as industry characteristics, stakeholder engagement, and green technology innovation. In addition, there is contextual variation in the impact of digital transformation, with more significant effects in large firms, non-state-owned enterprises, and regions with a more favorable business environment.

Theory Used

The research, based on an analysis of 51 internationally reputable journal articles, reveals that the technologies used are predominantly related to sustainability-based innovation and environmental management. Digital technologies such as the *Internet of Things* (IoT), *big data analytics*, and artificial intelligence (AI) systems are widely used to monitor and predict environmental impacts, optimize resource use, and increase transparency in sustainability reporting. Renewable energy technologies, such as solar panels and battery-based energy storage systems, are becoming a focus in implementing environmental policies and achieving the Sustainable Development Goals (SDGs).

In addition, digital collaborative platforms and *blockchain* are used to strengthen multi-stakeholder engagement, ensure accountability, and manage conflicts of interest. In the context of strategic management, *cloud computing-based* technologies and predictive analytics tools support organizations in orchestrating resources (human, financial, and infrastructure) and building dynamic capabilities to adapt to changing regulations and market demands. The use of such technologies not only strengthens the implementation of environmental policies but also becomes a critical instrument in achieving alignment between business practices, SDGs goals, and stakeholder expectations.

Based on the analysis of 51 articles, the most widely used theory is Stakeholder Theory (35%), which emphasizes the importance of integrating the interests of various stakeholders (government, community, business) in sustainable decision-making. This theory dominates because the complexity of environmental and sustainability issues requires multidimensional collaboration. In the second position, Environmental Policy (25%) is the basis for analyzing the implementation of regulations, incentives, and sanctions to encourage environmentally friendly practices. SDGs (15%) is used as a global frame of reference to measure research contributions to the 17 development goals. The Echelons Theory (10%)

explains the role of leadership hierarchy in adopting sustainable technologies and policies, while other theories namely; Resource Orchestration Theory (8%) and Dynamic Capability Theory (DCT) (7%) focus on the ability of organizations to manage resources efficiently and adapt to external dynamics. This combination of theories reflects the need for a holistic approach, starting from the policy level, organizational strategy, to operational capabilities, to achieve sustainable transformation.

Research Location

Research on ESG (Environmental, Social, Governance) performance in 51 internationally reputable journal articles shows a diverse geographical distribution, with the dominance of developed countries and large economies. China is the most dominant research location (25%), reflecting the urgency of green transition and technological innovation in a country with high levels of industrialization and complex environmental challenges. Italy took second place (18%), driven by a focus on sustainability in the manufacturing and renewable energy sectors. The United States (US) contributed 15%, with many studies highlighting strict ESG regulations and the role of multinational corporations. The UK contributed 10%, mainly in studies on ESG integration in the financial sector and climate change policy. Countries such as Australia (6%), Yemen (4%), and Ghana (4%) represent unique regional contexts, such as natural resource management and sustainability challenges in developing countries. Meanwhile, South Korea (4%), Asia Pacific (3%), France (3%), Germany (3%), Spain (3%), and Sweden (2%) show variations in focus on digitalization, green policies, and ESG adaptation in specific industries such as automotive and energy. The dominance of developed countries such as China, Italy, the US and the UK reflects the availability of data, mature regulatory infrastructure and the prioritization of sustainable development in the policy agenda of these four countries.

The results of the geographical distribution analysis of ESG performance research show an imbalance in representation between developed countries (85%) and developing countries (15%). China (25%), Italy (18%), the US (15%), and the UK (10%) are the main centers of ESG studies, driven by regulatory complexity, technological innovation, and stakeholder pressure for sustainability transparency. This dominance indicates that ESG research is still concentrated on regions with high institutional and technological capacity, while developing countries such as Yemen and Ghana are less explored despite their critical environmental and social challenges. The findings also underscore that locations with pro-environmental policies (such as China and Italy) and adoption of digitalization (US and UK) tend to produce studies that reveal the positive impact of ESG. However, the underrepresentation of developing countries has the potential to create bias in the global understanding of ESG, especially regarding local contexts such as climate resilience and social inclusion.

Industry

An analysis of 51 internationally reputable journal articles reveals the diversity of industries that are the focus of research. The financial industry emerged as the most researched sector (25%), reflecting the importance of ESG aspects in investment decision-making and risk management. The environmental industry also received significant attention



(20%), in line with the increasing global awareness of sustainability issues. The banking sector (15%), as part of the financial industry, is also a focus of research, particularly in relation to its role in sustainable financing. The manufacturing industry (10%), with its potentially large environmental impact, is also a relevant research object. In addition, other industries such as startups (5%), accounting (5%), education (5%), maritime companies (5%), IT (5%), and the handicraft industry (5%) also appear in the research, albeit with lower frequency. This shows that ESG issues and digital transformation are relevant across different sectors of the economy.

The analysis of 51 articles shows that the financial industry is the most focused sector, followed by the environmental, banking, and manufacturing industries. Other industries such as startups, accounting, education, maritime companies, IT, and handicraft industries are also the object of research, but with lower frequency. This indicates that ESG issues and digital transformation have significant relevance across different sectors of the economy, with varying levels of attention.

Measurement Methods Used

An analysis of 51 journal articles revealed a variety of measurement methods used to evaluate ESG performance and impact in the context of digital transformation. Bibliometric methods emerged as the most dominant (25.5%), reflecting the strong trend of literature analysis in this field. This method allows researchers to identify trends, patterns and networks in scientific publications related to ESG and digital transformation. In addition, some studies used established ESG assessment databases and indices, such as Sustainalytics (9.8%) and the Australian Stock Exchange (BEA) (5.8%), to measure companies' ESG performance. Quantitative methods, including regression analysis and descriptive statistics, are also widely used to test the relationship between relevant variables (11.7%). Other methods such as Natural Language Processing (NLP) (7.8%), Taxonomy (3.9%), Entropy Method (5.8%), Analytic Hierarchy Process (AHP) (7.8%), Weighted Aggregated Sum Product Assessment (WASPAS) (7.8%), Data Envelopment Analysis (DEA) (5.8%), exploratory research methods (5.8%), text mining methods (9.8%), modified Jones model (9.8%), and Roy-Chowdhury model (9.8%) were also used, showing the variety of approaches in measuring and analyzing ESG performance and digital transformation.

Based on the analysis of 51 journal articles, it can be concluded that bibliometric methods are the most dominant measurement method in ESG and digital transformation research. Quantitative methods and the use of established ESG databases are also commonly used. In addition, a variety of other methods such as NLP, Taxonomy, Entropy Method, AHP, WASPAS, DEA, exploratory research methods, text mining methods, modified Jones model, and Roy-Chowdhury model are also used, demonstrating the variety of approaches in measuring and analyzing ESG performance and digital transformation.

Future Research Directions

Future research in accounting related to the influence of digital technology on ESG performance needs to prioritize multistakeholder perspectives, including consumers, investors, and policymakers, to understand the dynamics of the interaction between technological innovation and sustainability practices (Shi et al., 2025). The concept of dual materiality proposed by some researchers can be a theoretical foundation for improving ESG

performance, especially by clarifying environmental and social impacts in corporate decision-making towards the Sustainable Development Goals (SDGs) (W. Li & Pang, 2023). The AIESG Protocol, as an artificial intelligence (AI)-based evaluation framework, offers the potential to increase transparency of digital technology impacts on ESG, while promoting responsible AI governance and effective stakeholder communication (Baratta et al., 2025). On the other hand, adaptation of ESG frameworks post-pandemic requires the integration of qualitative approaches and global perspectives to capture the complexity of changing socio-economic contexts, including disparities in digital access in rural areas (Shi et al., 2025). Digital infrastructure investment is recommended Li & Pang, (2023) can be a strategic solution to enhance stakeholder participation and accountability of ESG reporting. Hence the need for synergy between technology, regulation, and inclusive accounting practices. Furthermore, Shi et al. (2025) underlines four critical research lines: AI-human collaboration in evidence-based decision making (EBM), knowledge management, ESG integration in EBM development, and cross-cultural conflict resolution. Meanwhile, Baratta et al. (2025) emphasized the need for holistic governance and targeted investment in Industry 4.0 to mitigate the digital divide and drive sustainable growth.

Based on the synthesis of 51 journal articles, future research directions in accounting and ESG focus on: (1) a multistakeholder approach to optimize the impact of digital technology on ESG transparency and accountability; (2) development of evaluation instruments such as the AIESG protocol and the concept of dual materiality to strengthen SDGs integration; and (3) adaptation of the post-pandemic ESG framework through a combination of qualitative-quantitative methods and global perspectives. Key challenges include AI-human collaboration, cross-cultural conflict resolution, and sustainable governance of Industry 4.0. Future research needs to be interdisciplinary, combining technology, accounting, and public policy insights, with a focus on equitable innovation and responsiveness to global dynamics.

CONCLUSION

Analyzing 51 research articles, the majority of studies (57.7%) confirmed the positive impact of digital transformation on ESG performance through increased transparency, efficiency and accountability, especially in the face of global challenges such as the COVID-19 pandemic. The adoption of technologies such as Industry 5.0, green innovation, and digital inclusive finance is proven to strengthen real-time and reliable ESG reporting. However, 19.2% of studies identified academic gaps, such as the lack of exploration of greenwashing, inequality of digital access in developing countries, and early-stage implementation challenges due to resource constraints and technological immaturity. A total of 69.2% of studies showed a significant impact of digitalization and regulatory factors, although another 15.4% found insignificant or negative results, especially regarding industry context and organizational adaptive capacity.

Stakeholders (35%) and Environmental Policy (25%) theories dominate the analytical framework, emphasizing multisector collaboration and the role of regulation in promoting sustainable practices. Geographically, research is still concentrated in developed countries (85%) such as China, Italy, the US and the UK, while developing countries with complex social environmental challenges such as Yemen and Ghana are underrepresented.



The financial, environmental and manufacturing sectors are the main focus, despite the increasingly urgent need for interdisciplinary approaches to address challenges such as AI integration, cross-cultural conflict resolution and sustainable governance in the industry 4.0 era. Going forward, research is directed towards developing holistic evaluation instruments, inclusive digital infrastructure, and responsive post-pandemic frameworks, balancing between global and local perspectives to reduce bias and ensure equitable innovation.

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