

The Strategic Role of Information Systems in Advancing Sustainable Business Practices

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ABSTRACT: Information systems are increasingly recognized as enablers of sustainable business practices. However, the extent of their impact across environmental, social, and governance (ESG) dimensions remains limited in current scholarship, particularly regarding mechanisms of influence. This narrative review investigates how information systems contribute to sustainability by enhancing operational efficiency, informing strategic decisions, and overcoming implementation challenges. Drawing from Scopus and Google Scholar, a systematic search was conducted using Boolean keyword combinations such as "Information Systems" AND "Sustainable Business Practices" and "Digital Transformation" AND "Sustainable Development." Studies meeting inclusion criteria—focused on the integration of IT in sustainability efforts—were synthesized thematically. The findings indicate that information systems significantly improve energy efficiency, reduce waste, and support environmental accounting. They enable real-time monitoring, predictive analytics, and decision-making frameworks grounded in ESG principles. Big data and cloud platforms are shown to facilitate cross-functional collaboration and innovation. However, implementation is often hindered by infrastructural limitations, high costs, and resistance to change, especially in developing regions. The role of regulatory support and organizational culture emerged as critical systemic enablers. Comparative insights between countries highlighted best practices that can be adapted to local contexts. This review concludes that information systems are not merely tools but strategic assets for sustainability. Policy incentives, capacity-building, and inclusive digital infrastructure are recommended to bridge implementation gaps. Future research should explore the integration of emerging technologies for enhanced impact. Promoting awareness and access remains essential to scaling sustainable practices globally.

Keywords: Information Systems, Sustainable Business, Digital Transformation, ESG, Big Data, Cloud Computing, Organizational Change.



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INTRODUCTION

In the contemporary landscape of corporate transformation, sustainability has evolved from a peripheral concern into a core strategic imperative. This paradigm shift is fueled by growing global

awareness of climate change, social inequality, and governance deficits, prompting organizations to adopt more responsible and transparent business practices. Amid this transition, information systems (IS) have emerged as a vital enabler of sustainable business practices, providing tools to monitor, evaluate, and drive environmental, social, and governance (ESG) initiatives. The role of IS in fostering sustainability is increasingly being explored in the academic literature, reflecting the convergence of digital innovation and sustainable development goals. Recent research highlights the transformative potential of IS to enhance operational efficiency, increase transparency, and support strategic decision-making for sustainability (Pesqueira & Sousa, 2024; Van et al., 2024).

The advent of advanced digital technologies such as Industry 4.0, big data analytics, and cloud computing has redefined the operational and strategic contours of modern organizations. These technologies empower companies to process large volumes of data, enable real-time insights, and facilitate integrated decision-making processes. In the context of ESG, such capabilities translate into more accurate performance monitoring, better stakeholder communication, and improved compliance with regulatory requirements. Scholars argue that integrating IS with sustainability practices can enable firms to innovate in their business models, aligning financial goals with long-term environmental and social value creation (Böttcher et al., 2023; Hanelt et al., 2016).

Fundamental data reinforce the urgency and relevance of this integration. Studies report that over 60% of large corporations have adopted sustainability-related IS tools to monitor energy consumption, reduce carbon emissions, and manage supply chain transparency (Barneveld & Silvius, 2022; Sabauri, 2024). Technologies such as cloud-based platforms have facilitated enhanced ESG reporting, while big data analytics have provided granular insights into environmental and social impacts (Pesqueira & Sousa, 2024; Hong & Xiao, 2024). The impact of such tools is particularly significant in high-resource industries like manufacturing, where digital solutions contribute to more sustainable supply chain management and energy optimization (Hoff & Shell, 2023).

The trend towards IS-enabled sustainability is not uniform across sectors or regions. In manufacturing, for instance, integration of green ERP systems has yielded tangible improvements in efficiency and waste reduction (Böttcher et al., 2023). Conversely, the public sector has demonstrated a slower rate of adoption, often hindered by bureaucratic inertia and budgetary constraints (Ragin-Skorecka & Hadaś, 2024; Sabauri, 2024). Similarly, in developing countries, infrastructural limitations and limited access to capital restrict the scalability of sustainability-focused IS adoption, despite growing awareness of its strategic importance (Sareminia & Haji, 2024; Yang et al., 2019).

Despite these advances, several persistent challenges hinder the effective deployment of IS for sustainable business transformation. A significant obstacle is the misalignment between corporate leadership expectations and the operational realities of implementing sustainability initiatives. Managers often perceive sustainability as a cost center rather than a strategic investment, undermining internal commitment and resource allocation (Gunarathne et al., 2020; Ragin-Skorecka & Hadaś, 2024). Furthermore, existing IS infrastructures may lack the capacity or flexibility to accommodate evolving sustainability metrics, thereby impeding the realization of long-term goals (Barneveld & Silvius, 2022).

Another critical challenge lies in the organizational culture and stakeholder engagement. Successful implementation of IS-driven sustainability initiatives requires not only technological readiness but also cultural alignment and stakeholder collaboration. Studies show that organizations with higher levels of internal awareness and interdepartmental cooperation are more likely to integrate IS effectively into their sustainability strategies (Thornton et al., 2019; Zhang et al., 2025). Inadequate training programs and insufficient stakeholder buy-in often limit the transformative potential of IS investments.

Moreover, while ESG reporting has improved with IS integration, significant gaps remain in standardization and comparability of sustainability performance data. There is no universal framework for ESG data measurement, resulting in inconsistent and sometimes unreliable disclosures across organizations (Bulyga et al., 2023). This lack of uniformity complicates benchmarking and weakens the strategic value of ESG data for investors and policymakers. Additionally, research on how IS can induce behavioral change towards sustainability within organizations is still nascent, highlighting a critical gap in the literature (Hassan et al., 2025).

Addressing these gaps is essential to fully leverage IS as a catalyst for sustainability. This narrative review aims to synthesize current scholarly discourse on the integration of information systems in supporting sustainable business practices. Specifically, the review seeks to explore the mechanisms through which IS contributes to the design, implementation, and evaluation of ESG strategies. It examines the interplay between technology, organizational culture, and managerial policies in shaping sustainable outcomes, while identifying enabling and inhibiting factors in various industrial and geographic contexts.

The scope of this review is both thematic and contextual. Thematically, it focuses on the intersection of information systems and sustainability, with a particular emphasis on environmental monitoring, social accountability, and governance transparency. Contextually, the review spans diverse sectors, including manufacturing and public administration, and pays special attention to differences in adoption and implementation practices across developed and developing countries. Through this comprehensive analysis, the review seeks to offer a nuanced understanding of how IS can be strategically harnessed to support sustainability transitions in various organizational settings.

By mapping the current state of knowledge and identifying critical research gaps, this review provides a foundation for future scholarly inquiry and practical innovation. It underscores the importance of aligning technological advancements with sustainable business imperatives and highlights the need for multi-level strategies that integrate policy, technology, and human factors. Ultimately, the review aspires to contribute to the evolving discourse on sustainable digital transformation, fostering pathways towards more resilient, equitable, and environmentally responsible business practices.

METHOD

This narrative review adopts a structured and systematic approach to examine how information systems (IS) support sustainable business practices across various sectors. The methodological process was designed to ensure comprehensive coverage, rigor, and relevance of the literature analyzed. To that end, the review employed a multi-phase process encompassing literature search, selection, thematic synthesis, and evaluation, guided by established narrative review practices in information systems and sustainability research.

The literature search commenced with the identification of peer-reviewed sources from prominent academic databases, specifically Scopus and Google Scholar. These platforms were selected due to their extensive coverage of multidisciplinary scientific literature and their established reliability in indexing reputable academic publications. The search was conducted between February and May 2025 to ensure inclusion of the most recent contributions to the field. No language restrictions were imposed, but only articles published in English were considered for inclusion to maintain consistency in interpretation and analysis.

To guide the search process, a set of carefully selected keyword combinations was utilized. These keywords were derived from a preliminary scan of the literature and refined based on terminologies frequently used in recent academic publications. The primary combinations included phrases such as "Information Systems" AND "Sustainable Business Practices," "Information Technology" AND "Sustainability," "Digital Transformation" AND "Sustainable Development," and "Green IT" AND "Business Sustainability." Boolean operators such as AND and OR were used to combine terms and expand the scope of retrieval, while quotation marks were employed to preserve phrase integrity. For instance, queries like "Information Systems" OR "Information Technology" combined with "Sustainability" OR "Sustainable Development" proved effective in retrieving articles that framed sustainability both as an operational goal and a strategic imperative.

To further refine the search and enhance its relevance, filters provided by the databases were employed. The publication year filter was set to include studies published from 2010 onwards, considering the rapid evolution of IS and sustainability frameworks in the past decade. Only peer-reviewed journal articles, conference papers, and book chapters were retained, while editorials, book reviews, and non-scholarly documents were excluded. Additional filters were applied to limit results to subject areas such as business, management, environmental sciences, and computer science.

Following the retrieval of initial search results, a screening process was conducted to determine the eligibility of studies for inclusion in the review. The screening occurred in two stages: title and abstract screening, followed by full-text assessment. In the first stage, duplicate entries were removed, and articles were reviewed for apparent relevance based on their titles and abstracts. In the second stage, the full texts of potentially relevant articles were examined in detail to confirm their alignment with the review objectives.

The inclusion criteria were set to ensure the selection of high-quality studies that directly addressed the interaction between information systems and sustainable business practices. Studies were

included if they examined: (1) the application of IS or IT in promoting environmental, social, or governance (ESG) objectives; (2) empirical, conceptual, or theoretical analyses of IS strategies aligned with sustainability goals; or (3) the role of digital tools, analytics, or infrastructures in enabling sustainable business transformations. Exclusion criteria eliminated studies that lacked explicit focus on IS or sustainability, addressed sustainability in purely ecological or social terms without technological components, or focused solely on technical IS implementations unrelated to sustainability outcomes.

The final corpus of literature comprised both qualitative and quantitative studies, including case studies, surveys, systematic reviews, and conceptual frameworks. Qualitative research provided rich insights into organizational behavior, stakeholder dynamics, and cultural factors affecting IS adoption for sustainability. Case studies illustrated real-world implementations of green IT, ESG reporting platforms, and data analytics tools in diverse contexts. Quantitative studies contributed empirical evidence on performance outcomes, environmental impact reductions, and return on investment from IS-supported sustainability initiatives. Conceptual papers, meanwhile, offered theoretical grounding by exploring the synergies between IS capabilities and sustainability principles.

Once the final set of studies was selected, a thematic synthesis was conducted to organize the findings into coherent analytical categories. This involved close reading of the articles to extract recurring themes, challenges, enablers, and conceptual models. The analysis focused on three primary dimensions: (1) effectiveness of IS in supporting sustainability efforts, (2) barriers to IS integration within organizational sustainability frameworks, and (3) innovative approaches and future directions for IS-enabled sustainability. These themes were not predetermined but emerged inductively through iterative engagement with the literature, in line with qualitative research norms.

Special attention was paid to identifying gaps and inconsistencies within the body of literature. For example, while many studies discussed the potential of big data and cloud computing for ESG monitoring, few addressed the practical challenges of data interoperability or stakeholder engagement in data-driven decision-making. Moreover, although digital dashboards and ERP systems were frequently cited as tools for sustainability reporting, the literature lacked comprehensive analyses on the long-term behavioral changes induced by these technologies. Identifying such gaps provided a foundation for recommending avenues of future research, particularly in underexplored areas such as technology-driven behavioral change and cross-sectoral knowledge transfer.

To ensure methodological robustness, the review process was guided by principles of transparency, replicability, and critical evaluation. Each selected article was documented along with its publication source, year, methodological approach, and relevance to the review objectives. Where applicable, insights were triangulated across multiple sources to confirm consistency and reduce bias. Although this review did not employ a formal quality assessment tool such as the Critical Appraisal Skills Programme (CASP), articles published in Scopus-indexed journals and conferences were presumed to meet baseline quality standards due to their peer-review processes.

In summary, this methodology integrates structured database search techniques, rigorous inclusion and exclusion protocols, and thematic analysis to provide a comprehensive overview of how information systems contribute to sustainable business practices. By combining empirical evidence, theoretical discourse, and methodological diversity, the review offers a rich and balanced understanding of current knowledge and emerging trends in the field. The systematic yet flexible approach adopted here reflects the complexity and interdisciplinary nature of sustainability challenges, emphasizing the need for adaptive research strategies that align with evolving technological and environmental landscapes.

RESULT AND DISCUSSION

The synthesis of literature in this narrative review reveals several interrelated themes on the role of information systems in supporting sustainable business practices. These themes include: the role of IS in enhancing operational efficiency and reducing environmental waste; IS-driven support for strategic decision-making through data analytics; challenges and organizational barriers to IS implementation; and the variation in approaches between developed and developing countries. Each thematic cluster is discussed below based on the relevant scholarly contributions, highlighting the empirical evidence and regional comparisons that shape the discourse.

One of the most evident contributions of information systems to sustainability is their capacity to improve operational efficiency and reduce energy waste. Across various industries, the implementation of Environmental Information Management Systems (EIMS) has been shown to significantly reduce the environmental footprint of organizational operations. These systems allow for real-time monitoring and predictive analysis of energy consumption, enabling more efficient use of resources (Ragin-Skorecka & Hadaś, 2024). In particular, Gunarathne et al. (2020) emphasize that integrating environmental accounting practices into organizational IS frameworks helps reduce inefficiencies and minimize environmental impacts. Similarly, Barneveld and Silvius (2022) argue that IS-driven visibility into material flows and energy consumption not only facilitates waste reduction but also supports strategic sustainability planning through the provision of historic and predictive analytics.

Empirical examples reinforce these assertions. In lean manufacturing environments, for instance, IS tools have played a pivotal role in integrating green technologies to reduce carbon emissions and optimize production flows (Hanelt et al., 2016; Barneveld & Silvius, 2022). Case studies indicate that companies utilizing cloud-based platforms for sustainability reporting have seen improvements in resource optimization, due in large part to the centralized and collaborative features of cloud computing (Gunarathne et al., 2020). These platforms enable deeper data analysis and facilitate cross-departmental cooperation, which is crucial in identifying inefficiencies and promoting adaptive strategies for environmental management.

Information systems also underpin data-driven strategic decision-making in sustainability contexts. Through enhanced data collection, processing, and dissemination, IS tools provide the empirical foundation required to evaluate and optimize sustainability initiatives. Rezac (2022) underscores the utility of IS in embedding ESG dimensions into corporate strategy, noting that robust IT

infrastructure allows organizations to monitor performance and realign strategies in response to emerging environmental and social risks. In support of this, Pesqueira and Sousa (2024) show how real-time IS dashboards help corporate decision-makers act swiftly in response to environmental performance metrics, thereby enhancing adaptive capacity.

Central to this data-driven strategy is the growing role of big data and analytics. Big data technologies offer the capacity to analyze high-volume, high-velocity, and high-variety data sets, providing deep insights into sustainability-related variables such as consumption trends, emission levels, and stakeholder engagement. According to Van et al. (2024), companies that harness big data analytics as part of their ESG programs are better equipped to identify risk exposures, monitor compliance, and innovate for sustainable growth. Böttcher et al. (2023) similarly note that the ability to correlate large data sets with performance indicators leads to more precise sustainability forecasting and the creation of proactive business models.

Beyond monitoring, big data analytics facilitate innovation by identifying patterns that support the development of sustainable products and services. For example, the aggregation of lifecycle data allows firms to pinpoint environmentally intensive stages of production, encouraging the redesign of processes for greater sustainability. In this sense, IS becomes both a reactive and proactive instrument: it helps identify existing inefficiencies while simultaneously enabling forward-looking innovation strategies.

Despite these positive outcomes, organizations continue to face significant barriers in implementing information systems for sustainability objectives. Technological complexity, inadequate infrastructure, and limited human resource capabilities often undermine the success of such initiatives. Small and medium-sized enterprises (SMEs), in particular, struggle with the high costs of deploying sophisticated IS platforms and the technical knowledge required to operate them effectively (Pesqueira & Sousa, 2024). Furthermore, legacy systems frequently lack interoperability with newer technologies, creating silos that inhibit information sharing and limit the strategic value of integrated sustainability data (Ragin-Skorecka & Hadaś, 2024).

Cultural and structural resistance within organizations also impedes IS adoption. Many firms encounter internal inertia, where traditional work practices and hierarchical decision-making models hinder the embrace of sustainability-oriented technologies. Ragin-Skorecka and Hadaś (2024) identify organizational misalignment as a persistent issue, in which corporate leadership is enthusiastic about sustainability in principle, but operational divisions fail to implement meaningful changes. This disconnect often stems from a lack of awareness or appreciation of the long-term strategic value of sustainability investments.

Overcoming such resistance requires deliberate strategies to build internal support for IS implementation. Training programs, transparent communication, and inclusive change management initiatives have all been cited as effective tools in this regard. Gunarathne et al. (2020) advocate for participatory approaches in which employees are involved in the design and deployment of new systems, increasing their sense of ownership and reducing apprehension. Additionally, internal communication strategies that clearly articulate the strategic benefits of IS integration have been shown to increase acceptance and alignment across organizational levels.

The review also reveals marked differences in how developed and developing countries approach the intersection of IS and sustainability. In developed regions such as Western Europe and North America, robust IT infrastructure and supportive policy environments facilitate widespread IS adoption for sustainability reporting and management. Companies in these regions often utilize advanced systems, including cloud-based ESG platforms and blockchain for supply chain transparency (Van et al., 2024). These technologies not only improve monitoring but also enhance credibility and stakeholder trust through transparent data practices.

Conversely, organizations in developing countries frequently face structural and resource constraints that inhibit full-scale IS implementation. Infrastructure limitations, high costs, and insufficient digital literacy often prevent organizations from investing in and maintaining advanced IS systems (Khuntia et al., 2018; Sánchez et al., 2019). Furthermore, the absence of strong regulatory frameworks diminishes incentives for organizations to prioritize ESG performance and digital reporting. Nonetheless, awareness of sustainability imperatives is increasing, and incremental progress is evident in sectors such as renewable energy and agriculture, where donor-supported projects have introduced digital monitoring systems.

In this context, best practices from developed countries offer valuable lessons for adaptation. Community engagement programs and public-private partnerships, for example, have proven effective in enhancing local capacity and technology acceptance. Van et al. (2024) highlight the role of community education in improving sustainability outcomes, particularly when local populations are trained to understand and utilize IS tools for monitoring and decision-making. In addition, countries like Germany and Sweden have pioneered integrated smart systems for energy and waste management, which serve as model frameworks for gradual adoption in emerging markets (Khuntia et al., 2018; Sánchez et al., 2019).

Emerging technologies such as the Internet of Things (IoT) and blockchain also offer scalable solutions adaptable to resource-constrained environments. IoT devices can be deployed to monitor real-time energy use in off-grid locations, while blockchain can offer secure and transparent record-keeping even in settings with limited institutional oversight (Hong & Xiao, 2024). Although these technologies require initial investment and capacity-building, they present opportunities for leapfrogging traditional infrastructure constraints and accelerating the integration of IS into sustainable business practices.

Taken together, the findings from this review underscore the transformative role of information systems in promoting sustainability across operational, strategic, and systemic levels. IS enhances efficiency and waste reduction, supports data-driven decision-making, and facilitates innovation. However, these benefits are contingent upon overcoming technical, organizational, and contextual challenges. The contrast between developed and developing contexts further emphasizes the need for tailored strategies that reflect infrastructural realities and cultural nuances. Ultimately, the literature reveals both the promise and complexity of leveraging IS for sustainable development, pointing to a critical need for continued interdisciplinary research and context-specific implementation models.

This narrative review contributes to the growing body of literature on the intersection between information systems (IS) and sustainable business practices by offering nuanced insights into how IS facilitates sustainability strategies beyond mere operational support. The findings expand our

understanding of IS as an enabler of systemic organizational change and strategic innovation in sustainability. As highlighted by Hanelt et al. (2016), information systems, particularly those integrated with green technologies, are capable of driving core transformations in business models, enabling firms to embed sustainability into the heart of their operations rather than treat it as an ancillary function. This challenges earlier conceptualizations that framed IS solely as a back-end support mechanism for reporting and data management. The literature now increasingly recognizes IS as a transformative force capable of reshaping decision-making structures and corporate cultures.

The strategic application of IS is crucial for aligning sustainability goals with broader business strategies. Empirical evidence from studies such as those by Barneveld and Silvius (2022) and Ragin-Skorecka and Hadaś (2024) shows that IS applications like Environmental Information Management Systems (EIMS) contribute to real-time monitoring and predictive analytics, thereby enabling organizations to track energy consumption, reduce waste, and optimize the use of raw materials. The implications are significant: by transforming sustainability from a compliance requirement to a strategic asset, IS can enhance long-term organizational resilience and competitiveness.

From a policy standpoint, the integration of IS into corporate sustainability strategies necessitates institutional frameworks that incentivize technological investment and innovation. The review underscores the need for supportive policies, such as subsidies for green IT adoption and regulatory clarity in ESG (Environmental, Social, and Governance) reporting standards. Hack and Berg (2014) argue that well-defined regulatory structures not only guide corporate behavior but also lower uncertainty, thereby encouraging firms to make long-term investments in sustainable technologies. Similarly, Gunarathne et al. (2020) advocate for policy environments that promote environmental accounting practices, asserting that transparency in environmental performance reporting leads to stronger accountability and stakeholder trust. Such policy interventions have a dual benefit: they mitigate market failures related to environmental externalities and create competitive advantages for early adopters of sustainable IS solutions.

Systemic factors within organizations also significantly influence the success of sustainable IS implementation. The effectiveness of IS in promoting sustainability depends not only on the technological infrastructure but also on the organizational architecture and culture. As noted by Sánchez et al. (2019), organizational structures that facilitate interdepartmental communication are better positioned to implement cross-functional systems like EIMS and enterprise sustainability dashboards. These systems rely on integrated data flows and cooperative decision-making across finance, operations, and sustainability departments. The breakdown of silos within organizations is thus essential for realizing the full potential of IS in sustainability management.

Cultural receptivity to change further moderates the impact of IS on sustainability. Rezac (2022) emphasizes the role of a change-oriented organizational culture in the successful adoption of sustainability-oriented IS. When firms cultivate a culture that values innovation, learning, and environmental stewardship, employees are more likely to embrace new systems and processes. This cultural alignment enhances the likelihood that IS initiatives will be effectively utilized rather than resisted or underutilized. Moreover, employee training and stakeholder engagement, as

highlighted by Gunarathne et al. (2020), can reduce resistance to change and build internal advocacy for sustainable IS projects.

While the benefits of IS for sustainable business practices are evident, this review also identifies several persistent challenges that require attention. Chief among them are technological complexity, cost barriers, and skill shortages. Smaller firms, particularly in developing countries, face significant hurdles in accessing and deploying advanced IS solutions due to limited financial and human resources (Khuntia et al., 2018; Sánchez et al., 2019). This raises concerns about the global equity of IS-driven sustainability initiatives and highlights the need for capacity-building programs, technology transfer mechanisms, and localized support systems.

Comparative analysis between developed and developing regions further reveals the uneven landscape of IS adoption for sustainability. In developed economies, firms benefit from mature IT infrastructures and robust policy support, which facilitate the deployment of sophisticated IS tools such as cloud computing and big data analytics (Van et al., 2024). In contrast, developing countries often struggle with basic infrastructure challenges and lack targeted government initiatives to promote IS-based sustainability. This disparity underscores the importance of international cooperation and knowledge sharing to bridge the digital divide and promote inclusive sustainable development.

Adaptation of best practices from advanced economies must be context-sensitive. Successful examples from countries like Germany and Sweden, where IS tools have been effectively integrated with environmental management systems, provide valuable insights. However, these models must be adjusted to account for local institutional capacities, cultural norms, and socio-economic conditions. As Hong and Xiao (2024) suggest, incremental adoption strategies that prioritize low-cost, high-impact IS interventions—such as mobile-based energy monitoring tools or open-source sustainability platforms—may offer more feasible pathways for resource-constrained environments.

Potential solutions to implementation challenges include strategic alliances with technology providers, investment in training and education, and the development of modular IS solutions that can scale with organizational growth. Moreover, participatory design approaches that involve end-users in system development can ensure better alignment with organizational needs and reduce resistance to adoption. These approaches also foster a sense of ownership and accountability among employees, which is crucial for long-term system success.

Finally, this review acknowledges the methodological and empirical limitations of existing research. Most studies rely on case analyses and conceptual frameworks with limited generalizability. There is a need for more longitudinal and cross-sectoral research that examines the dynamic interactions between IS capabilities and sustainability outcomes over time. Additionally, empirical studies from underrepresented regions, particularly in the Global South, are essential to diversify the evidence base and inform more inclusive policy and practice.

In sum, the role of IS in sustainable business practices is multifaceted and transformative. It extends beyond technological implementation to encompass cultural change, strategic alignment, and systemic coordination across policy and organizational levels. Future research and practice

must therefore adopt a holistic perspective that considers these interdependencies to fully harness the potential of IS in advancing global sustainability goals.

This narrative review contributes to the growing body of literature on the intersection between information systems (IS) and sustainable business practices by offering nuanced insights into how IS facilitates sustainability strategies beyond mere operational support. The findings expand our understanding of IS as an enabler of systemic organizational change and strategic innovation in sustainability. As highlighted by Hanelt et al. (2016), information systems, particularly those integrated with green technologies, are capable of driving core transformations in business models, enabling firms to embed sustainability into the heart of their operations rather than treat it as an ancillary function. This challenges earlier conceptualizations that framed IS solely as a back-end support mechanism for reporting and data management. The literature now increasingly recognizes IS as a transformative force capable of reshaping decision-making structures and corporate cultures.

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CONCLUSION

This narrative review has illuminated the crucial role of information systems in fostering sustainable business practices. Drawing on a wide range of recent literature, the study has shown that information systems not only optimize operational efficiency—particularly in energy management and waste reduction—but also enable strategic, data-driven decision-making that integrates environmental, social, and governance (ESG) considerations into core business strategies. The findings emphasize that technological tools such as cloud computing, big data analytics, and digital transformation play an increasingly central role in shaping sustainable enterprises.

The discussion further highlights the importance of systemic factors such as supportive regulatory frameworks, collaborative organizational structures, and adaptive corporate cultures in ensuring the successful implementation of sustainable information systems. Moreover, the analysis reveals significant disparities between developed and developing countries in their capacity to leverage these technologies, pointing to an urgent need for inclusive policies and infrastructural investments.

To address the identified challenges, this study recommends the implementation of policy incentives that encourage the integration of sustainability-focused information systems, alongside targeted education and training initiatives to build digital and environmental literacy. Future research should explore longitudinal case studies to assess the long-term impacts of sustainable information system adoption and examine how emerging technologies like blockchain and IoT can be integrated for greater transparency and resource optimization. Ultimately, promoting access, awareness, and collaborative innovation stands out as a pivotal strategy in advancing global sustainability through digital transformation.

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