

BLENDING DIGITALIZATION WITH SUSTAINABLE BUSINESS PRACTICES

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ABSTRACT:

In recent years, corporate social responsibility (CSR) and sustainability have become integral parts of management practices across organizations worldwide. The growing emphasis on sustainable business practices has led to the adoption of digitalization in management, enabling the development of standardized procedures and codes related to sustainable development. This study explores the impact of digitalization on sustainable business practices by analyzing 67 papers encompassing various topics such as circular business models, eco-efficiency, stakeholder engagement, and digital supply chains. This study aims to identify digitalization practices for sustainable business, explore the integration of digitalization with sustainable practices, and understand the overall impact of digitalization on sustainable business practices. Three research questions guide the investigation: (1) What are the digitalization practices merged with sustainable business practices? (2) How does digitalization increase transparency and efficiency? (3) How can digitalization enhance sustainable practices? The findings reveal that digitalization facilitates more transparent and efficient management practices, transforming how organizations operate, perform functions, and manage day-to-day activities. By blending digitalization with management practices, stronger governance and sustainable decision-making can be achieved. Additionally, digitalization enables organizations to promote environmental, social, and governance (ESG) practices, make sustainable investment decisions, and maintain data in a methodological and systematic manner. This study contributes to the existing body of knowledge by synthesizing and analysing diverse research articles that highlight the intersection of digitalization and sustainable business practices. The findings provide insights for practitioners and policymakers to harness the potential of digitalization for fostering sustainable development. Further research can explore specific digitalization strategies and their implications on sustainable business practices to deepen our understanding of this evolving field.

KEYWORDS: DIGITALIZATION; SUSTAINABLE BUSINESS PRACTICES; MANAGEMENT; CORPORATE SOCIAL RESPONSIBILITY (CSR); LITERATURE REVIEW

1 INTRODUCTION:

In the past decade, the concepts of corporate social responsibility (CSR) and sustainability have gained significant attention and prominence in the field of management (Al-Omouh, 2022). Organizations across the globe are increasingly recognizing the importance of adopting

sustainable business practices, which not only contribute to societal and environmental well-being but also have a positive impact on their own long-term success(Montiel et al., 2020). The notion of sustainability has become ingrained in the organizational jargon, and companies are actively seeking ways to integrate sustainable principles into their daily operations and strategic decision-making processes(Abueed & Aga, 2019).

Simultaneously, digitalization has emerged as a transformative force in various industries and sectors. The advent of digital technologies and their widespread adoption has revolutionized the way businesses operate, communicate, and interact with stakeholders(Almeida et al., 2020). The digitalization of management practices has enabled organizations to develop a set of standards, procedures, and codes related to sustainable development, facilitating more efficient and systematic ways of working(Mishra et al., 2023). This blending of digitalization with sustainable business practices has the potential to shape a new era of management characterized by transparency, accountability, and enhanced performance in environmental, social, and economic dimensions(Mishra et al., 2023).

The impact of digitalization on management practices has been a subject of considerable research and discussion(Bondarenko et al., 2022). Over the course of three decades, the use of digital means in management practices has evolved from mere automation of tasks to a more comprehensive transformation of business models, processes, and strategies. The integration of digital technologies, such as artificial intelligence, big data analytics, and cloud computing, has facilitated real-time data processing, improved decision-making, and enhanced collaboration within organizations and across supply chains(Azadnia et al., 2015).

One of the key implications of digitalization in management practices is the ability to foster transparency and efficiency. Digital tools and platforms enable organizations to collect, analyze, and disseminate information in a faster, more accurate, and accessible manner(Abdelhalim et al., 2023). This transparency enables stakeholders to make informed choices and holds organizations accountable for their actions and performance(Ahi & Searcy, 2015). Moreover, digitalization enhances the efficiency of management practices by automating routine tasks, streamlining processes, and optimizing resource allocation(Fan et al., 2023). This increased efficiency can lead to cost savings, reduced environmental footprints, and improved overall performance(Mishra et al., 2023).Furthermore, digitalization has the potential to change the perception of management itself. It impacts how management functions are performed, the emphasis on systematic procedures, the management of data, and the capacity to solve complex problems(Kumar Bhardwaj et al., 2021). Organizations can overcome traditional barriers by integrating digitalization into management practices, such as information silos, hierarchical structures, and slow decision-making processes. The agile and data-driven nature of digitalization enables organizations to respond quickly to changes in the business environment, identify emerging trends, and seize new opportunities(Seele, 2017).

Blending digitalization with management practices has the potential to create stronger governance structures within organizations. The transparency and accessibility of digital platforms allow for more effective monitoring, control, and reporting of organizational activities. Digital tools can facilitate the implementation of sustainable practices, enable effective stakeholder engagement, and support the integration of environmental, social, and governance (ESG) factors into decision-making processes(Gigante & Manglaviti, 2022; Khalil et al., 2022). By leveraging digital technologies, organizations can establish robust systems for

monitoring and evaluating their sustainability performance, thereby enhancing their reputation, attracting stakeholders, and fostering trust(Li et al., 2022).

In today's business landscape, sustainability and digital means have emerged as mainstream trends. Organizations increasingly recognize the interconnectedness of sustainable business practices and digitalization and are exploring ways to leverage the potential synergies between the two(Ahmad Amouei et al., 2023). Digitalization can enable management to make sustainable business decisions, promote ESG practices, facilitate sustainable investment decisions, and develop and maintain data more methodologically and systematically(Xu et al., 2021). Integrating digitalization and sustainable business practices presents a compelling opportunity for organizations to achieve a competitive advantage, stakeholder satisfaction, and long-term viability(Bilgin, 2009; Dal Mas et al., 2020).

2 LITERATURE REVIEW

The literature review presents an analysis of previous studies that have investigated the impact of digitalization on sustainable business practices. The review aims to identify and synthesize key findings, trends, and gaps in the existing literature, providing a comprehensive understanding of the topic.

1. Digitalization and Sustainable Business Practices

Numerous scholars have emphasized the importance of integrating digitalization with sustainable business practices. argue that digital technologies can enhance sustainability performance by enabling data-driven decision-making, resource optimization, and stakeholder engagement(Abdul-Salam, 2022; Amis et al., 1997). Similarly, highlight the potential of digitalization to foster transparency, accountability, and innovation in sustainability efforts. These studies highlight the overarching benefits of digitalization in driving sustainable business practices.

2. Digitalization for Transparency and Efficiency

Transparency and efficiency are key drivers of sustainable business practices. Digitalization plays a crucial role in enabling organizations to achieve these goals. Organizations can enhance transparency by effectively communicating their sustainability initiatives and progress by leveraging digital tools and platforms(Almeida et al., 2020; Bai & Sarkis, 2020). Digital technologies also facilitate the automation of processes, real-time data monitoring, and streamlined communication, leading to improved efficiency in sustainable practices. This improved efficiency allows organizations to reduce costs, optimize resource utilization, and enhance overall performance.

3. Digitalization for Stakeholder Engagement

Effective stakeholder engagement is essential for sustainable business practices. Digitalization provides organizations with various means to engage stakeholders, including customers, employees, suppliers, and communities(Chowdhury et al., 2020). Digital platforms like social media and online forums enable organizations to gather feedback, involve stakeholders in decision-making processes, and foster collaboration(Dubey et al., 2020a). Moreover, digitalization enhances the accessibility of information, empowering stakeholders to hold organizations accountable for their sustainability commitments. Digital tools facilitate the dissemination of sustainability-related information, enabling stakeholders to make informed choices and contribute to sustainable outcomes(Abdelhalim et al., 2023).

4. Digitalization for Data Management and Performance Measurement

Accurate and reliable data management is crucial for effective sustainability practices. Digitalization enables organizations to collect, store, analyze, and report sustainability-related data in a systematic and methodological manner. By leveraging digital technologies such as big data analytics and Internet of Things (IoT) devices, organizations can monitor their environmental impact, track performance indicators, and identify areas for improvement (Behl, 2020; Chatfield & Reddick, 2019). This data-driven approach facilitates evidence-based decision-making and allows organizations to measure and communicate their sustainability performance effectively.

5. Challenges and Barriers to Digitalization for Sustainable Business Practices

Despite the potential benefits, challenges and barriers are associated with integrating digitalization and sustainable business practices. One key challenge is the digital divide, which refers to the unequal access to and adoption of digital technologies across different regions and socio-economic groups. Organizations must address this divide to ensure equitable participation in sustainable initiatives (Holmes et al., 2015; Lee, 2020). Additionally, concerns about data privacy and cybersecurity pose significant obstacles to digitalization efforts. Organizations must navigate these challenges to build trust and ensure digital technologies' secure and responsible use for sustainability purposes.

3 METHODOLOGY

The methodology section of this research paper describes the process of selecting relevant papers from various databases and outlines the criteria used to narrow down the initial pool of papers. The study aimed to identify papers that explore the relationship between digitalization and sustainable business practices (Jhawar et al., 2023; Sharma et al., 2015). The research utilized Scopus, ScienceDirect, Elsevier databases, and Google Scholar as sources for collecting relevant papers. The following steps were undertaken to obtain a final set of papers for analysis.

1. Database Selection:

- Scopus, ScienceDirect, and Elsevier databases were chosen as they are reputable sources of scholarly articles covering a wide range of disciplines.
- Google Scholar was also included to ensure comprehensive coverage of relevant literature.

2. Initial Search Query:

- The initial search query used common keywords such as "Digitalization" and "Sustainable Business Practices" to retrieve relevant papers.
- The search query was applied to each database, and the results were combined.

3. Initial Paper Selection:

- The initial search yielded a total of 1,076 papers.
- To refine the selection, the following criteria were applied:
 - Language: Only English language papers were considered to ensure consistency and ease of understanding.
 - Peer-reviewed: Only peer-reviewed papers were included to ensure the reliability and quality of the selected articles.

- These criteria helped to eliminate papers that did not meet the language and review status requirements.
4. Screening Process:
 - The initial pool of papers was screened based on their titles, abstracts, and keywords.
 - Papers that were not relevant to the research topic or did not address the relationship between digitalization and sustainable business practices were excluded.
 - The screening process resulted in a reduced pool of 123 papers.
 5. Full Paper Review:
 - The remaining 123 papers were obtained in full text and carefully reviewed.
 - During the review process, each paper was assessed for its relevance to the research topic and its contribution to the understanding of the relationship between digitalization and sustainable business practices.
 - Based on the review, 76 papers were selected for further analysis.
 6. Publication Year Analysis:
 - The final set of papers consisted of articles published over a range of years.
 - The publication years of the selected papers were recorded to gain insights into the temporal distribution of research in the field.
 - The publication years of the papers included 2011, 2016, 2017, 2019, 2020, 2021, 2022, and 2023.
 7. Data Collection:
 - The selected 76 papers were carefully collected and organized for further analysis.
 - Relevant information, such as authors, titles, publication years, and publication sources, was recorded for each paper.
 - This data collection process facilitated the creation of a comprehensive dataset for the research.
 8. Data Analysis:
 - The collected data was subjected to various analytical techniques to derive meaningful insights.
 - The analysis focused on identifying key themes, trends, and patterns within the selected papers.
 - Commonalities, differences, and emerging perspectives were examined to address the research objectives and research questions.

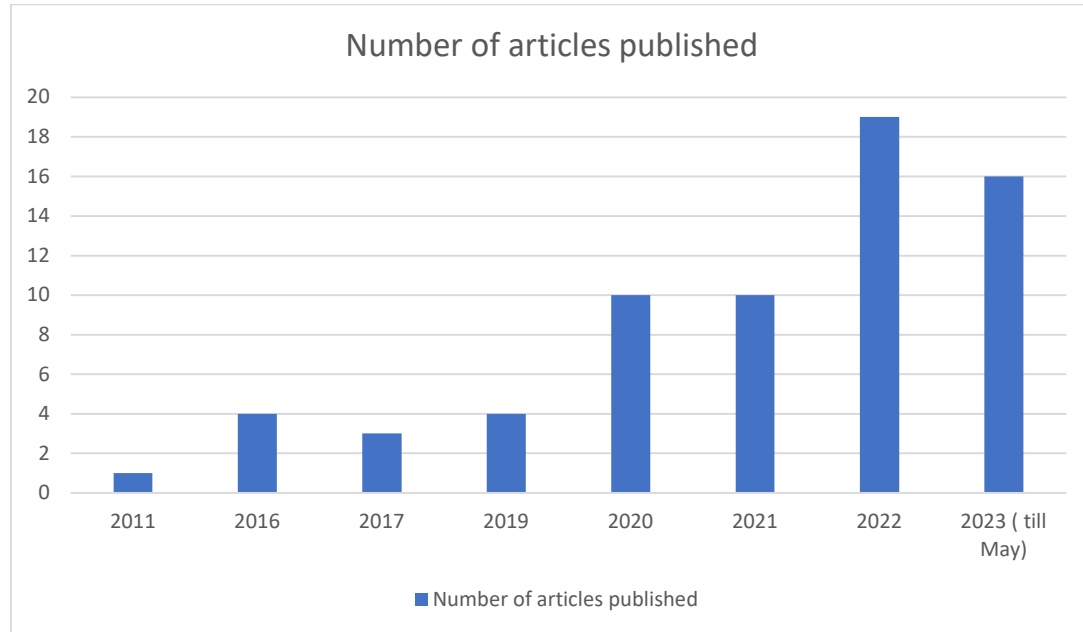
It is important to note that the methodology described above ensured a systematic and comprehensive approach to identifying and selecting relevant papers for the research. The use of multiple databases and the inclusion of Google Scholar helped to minimize the chance of missing important studies (Mishra et al., 2023). Additionally, the screening and full paper review processes ensured that only papers meeting the predefined criteria were included, ensuring the quality and relevance of the selected papers.

Overall, the methodology employed in this research paper aimed to gather a representative sample of papers exploring the relationship between digitalization and sustainable business

practices(Metawa et al., 2022). The systematic approach taken in the selection process helps to ensure the reliability and validity of the findings derived from the selected papers.

4 FINDINGS

5 Publication trends

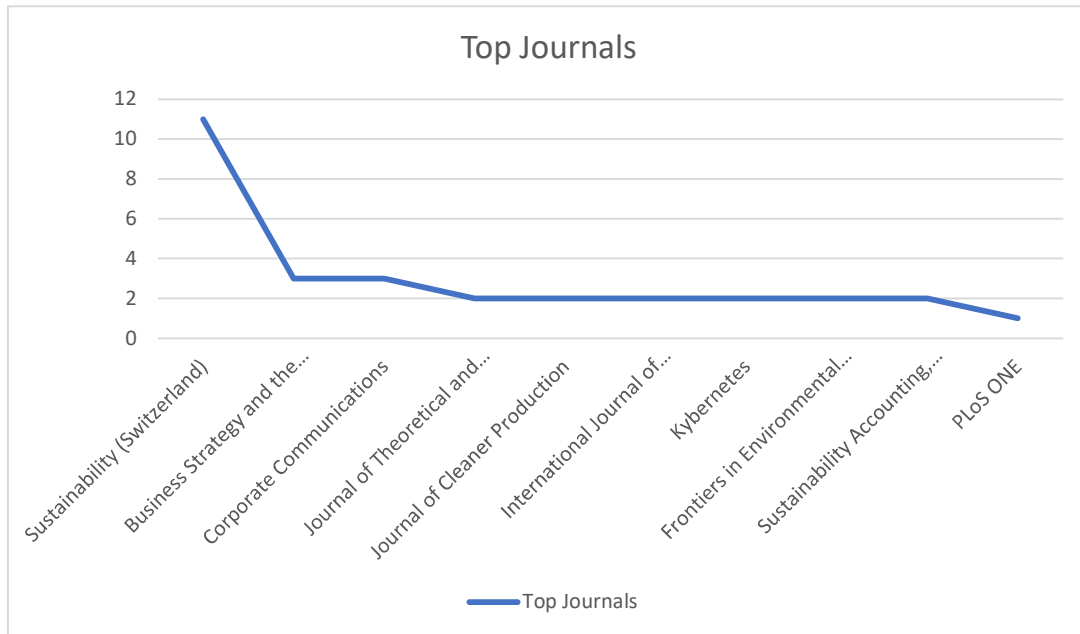


The data presented shows the number of articles published on the research topic over the years. It indicates a noticeable increase in the volume of literature on the topic in recent years. In 2011, only one article was published, suggesting a relatively limited focus on the topic at that time. However, there has been a significant growth in research interest since then.

From 2016 to 2020, the number of articles published gradually increased. In 2016, four articles were published, which demonstrates a growing attention towards the research topic. This trend continued with three articles published in 2017, and a further increase to four articles in 2019. The year 2020 saw a substantial jump in the number of publications, with ten articles, indicating a surge of interest and research activity in the field. The upward trajectory continued in 2021, with another ten articles published, highlighting the sustained interest in the research topic. The following year, 2022, witnessed a considerable spike in the number of publications, reaching 19 articles. This surge indicates a significant expansion in research efforts and a growing recognition of the importance of the topic. Up until May 2023, there have already been 16 articles published, suggesting that the research interest remains strong and the topic continues to attract attention in the academic community.

The increasing number of articles published on the research topic over the years signifies a growing interest and recognition of its significance(Jhawar et al., 2023). This trend reflects the evolving nature of the field and the need for further exploration and understanding. The substantial increase in publications in recent years suggests that researchers are actively contributing to the knowledge base and seeking to advance the understanding of the research topic(Mishra et al., 2023). This provides a strong foundation for ongoing research and indicates a promising future for the field.

6 Analysis of journals



The table presents the number of research articles published per journal in the given dataset. It provides insights into the distribution of publications across different journals, indicating variations in research focus and emphasis within the field. The journal with the highest number of articles published is "Sustainability (Switzerland)" with 11 articles. This suggests that the journal has established itself as a prominent outlet for research on sustainability-related topics. The significant number of publications indicates a strong emphasis on sustainability and its various dimensions within the academic community.

Following "Sustainability (Switzerland)," there are several journals with three articles each: "Business Strategy and the Environment," "Corporate Communications," and "Journal of Theoretical and Applied Electronic Commerce Research." These journals demonstrate a specific focus on topics related to business strategy, corporate communication, and electronic commerce. The number of publications suggests ongoing research efforts and interest in these specific areas. Furthermore, two journals have published two articles each: "Journal of Cleaner Production," "International Journal of Managerial and Financial Accounting," "Kybernetes," "Frontiers in Environmental Science," and "Sustainability Accounting, Management and Policy Journal." These journals cover a range of topics, including clean production, managerial and financial accounting, cybernetics, environmental science, and sustainability accounting. The multiple publications in these journals indicate a consistent research presence and engagement within their respective domains.

Lastly, the journal "PLoS ONE" has published one article, indicating a single contribution to the dataset. While the number may be relatively small compared to other journals, it still signifies a research effort in the field. The distribution of research articles across different journals provides insights into the scholarly landscape of the research topic. The high number of articles in "Sustainability (Switzerland)" and the presence of multiple publications in other journals demonstrate the active engagement and research interest in sustainability,

business strategy, corporate communication, electronic commerce, and related fields. This diversity of publications reflects the multidisciplinary nature of the research topic and highlights the collaborative efforts across various academic outlets.

7 Analysis of Keywords

Top 20 Keywords Used in the Papers	Occurrences
Corporate social responsibility	38
Digitalization	30
Sustainability	29
CSR	27
Digital transformation	19
Sustainable development	19
Supply chain	16
Social media	14
Green economy	11
Communication	10
Environmental sustainability	10
Stakeholder engagement	10
COVID-19	9
Corporate governance	9
Technology	9
Digital supply chain	8
Sustainable performance	8
Brand	7
Entrepreneurship	7
Stakeholders	7

The keywords provided encompass various aspects of sustainability, corporate social responsibility (CSR), digitalization, and related concepts. Some meaningful conclusions that can be drawn from the keywords are as follows:

Integration of sustainability and circular economy in the apparel industry: The keywords such as circular economy, slow fashion, and sustainability highlight the growing emphasis on adopting sustainable practices in the apparel industry(Abbate et al., 2023). Companies increasingly focus on minimizing waste, promoting ethical sourcing, and engaging stakeholders to achieve more environmentally friendly and socially responsible operations. Digitalization and CSR: The combination of keywords like digitalization, CSR, and stakeholder engagement signifies the role of digital technologies in facilitating corporate social responsibility initiatives(Ahmad et al., 2021; Fan et al., 2023). Digitalization provides new

opportunities for companies to enhance transparency, engage with stakeholders, and address societal and environmental challenges more effectively (Abdelhalim et al., 2023).

Sustainable development and digital transformation: The intersection of sustainable development, digitalization, and technology acceptance model implies that digital transformation is seen as a crucial enabler of sustainable development goals. Organizations are exploring ways to leverage digital technologies to enhance sustainability, improve performance, and foster innovation (Mishra et al., 2023). **Environmental sustainability and digital communication in the healthcare sector:** The keywords related to environmental sustainability, digitalization, and video consultations suggest the increasing integration of digital communication technologies in the healthcare sector (Anjum et al., 2020; Barbazzeni et al., 2022). Organizations are focusing on utilizing digital platforms to improve patient care, enhance stakeholder engagement, and ensure sustainable healthcare practices.

The impact of digitalization on supply chain sustainability: The keywords digitalization, green process, power balance, and supply chain sustainability indicate the significance of digital technologies in promoting sustainable supply chain practices. Companies are adopting digital solutions to improve supply chain transparency, optimize processes, and reduce environmental impact.

1. **Corporate Social Responsibility (CSR):** CSR is a prominent theme in multiple research papers. It highlights the increasing importance of corporate responsibility and its impact on various aspects such as sustainability, stakeholder engagement, crisis management, and supply chain management (Birindelli & Palea, 2023).
2. **Sustainability and Sustainable Development:** Sustainability is a key concern across many industries, including apparel, manufacturing, tourism, and supply chains. The papers emphasize sustainable practices' economic, social, and environmental effects and the need for sustainable development strategies (Holmes et al., 2015; Lee, 2020).
3. **Digitalization and Technology:** Digital transformation and digital technologies are highlighted in several papers, discussing their influence on various areas like CSR, supply chains, tourism management, and banking. The topics include digitization, digital supply chains, virtual reality, social media, and data storage (Fan et al., 2023; Hackius & Petersen, 2017).
4. **Environmental Impact and Pollution:** Environmental concerns are addressed through keywords such as greenhouse gases, environmental pollution, waste management, water resources, and climate change. The papers emphasize the need for environmental innovations, green processes, and circular economy models to mitigate negative impacts (Anser et al., 2021; Das et al., 2022).
5. **Stakeholder Engagement and Management:** Stakeholder engagement is critical in sustainable development, CSR, and supply chain management. It involves engaging various stakeholders such as customers, communities, employees, and indigenous populations in decision-making processes (Karamchandani et al., 2021; Wiese & Toporowski, 2013).
6. **Economic and Social Effects:** The economic and social effects of different factors are analyzed, including the impact of CSR, digitalization, energy efficiency, and global

- warming. The papers discuss economic opportunities, competitiveness, social trust, and the correlation between different variables(Mishra et al., 2023).
7. Supply Chain Management: Supply chains are addressed in the context of sustainability, digitalization, circular economy, and power balance. The papers discuss topics such as supply chain management, supply chain innovation, pricing decisions, and sustainable process optimization(Chen, 2018; Khalil et al., 2022).
 8. Biotechnology and Energy Efficiency: Biotechnology and energy efficiency are mentioned in the context of sustainability, manufacturing, and environmental management. The papers highlight the importance of energy-efficient practices and explore the relationship between biotechnology and sustainability(Dash et al., 2023; Saha et al., 2015).
 9. COVID-19: Several papers consider the impact of the COVID-19 pandemic on various aspects, including CSR, crisis management, tourism, and entrepreneurship. The pandemic has influenced strategic approaches, digital innovations, and sustainability(Almeida et al., 2020; Cankurtaran & Beverland, 2020).
 10. Other Topics: Other notable keywords include slow fashion, exploratory analysis, regression analysis, large volumes, infrastructure, costs, profitability, design/methodology/approach, and cultural factors(Mok et al., 2022; Velasco-Molpeceres et al., 2022).

8 Analysis of top-cited papers

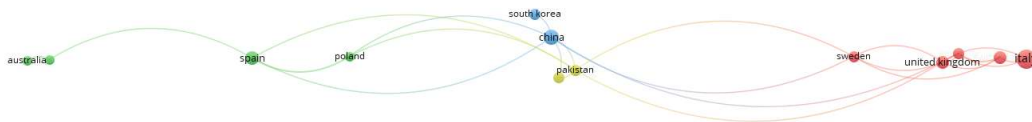
Top 20 cited papers Author and Year of publication	Number of Citation
Liu W., AgusdinataD.B.(2020)	52
Siano A., Conte F., Amabile S., Vollero A., PiciocchiP.(2016)	43
SeeleP.(2017)	41
Dreyer M., Chefneux L., Goldberg A., von Heimburg J., Patrignani N., Schofield M., Shilling C.(2017)	39
Hu Z., Zhou Q., Chen X., Chen D., Li J., Guo M., Yin G., Duan Z.(2019)	38
Montiel I., Delgado-Ceballos J., Ortiz-de-Mandojana N., Antolin-Lopez R.(2020)	37
Cheng G., Cherian J., Sial M.S., Mentel G., Wan P., Álvarez-Otero S., Saleem U.(2021)	34
Ahmad N., Naveed R.T., Scholz M., Irfan M., Usman M., Ahmad I.(2021)	34
Gupta S., Nawaz N., Alfalah A.A., Naveed R.T., Muneer S., Ahmad N.(2021)	34

Nayal K., Raut R.D., Yadav V.S., Priyadarshinee P., Narkhede B.E.(2022)	33
Coluccia D., Fontana S., SolimeneS.(2016)	24
Lee Y.-K., Park J.-W.(2016)	23
Iazzi A., Pizzi S., Iaia L., Turco M.(2020)	23
Papahristou E., BilalisN.(2017)	19
Gupta S., Nawaz N., Tripathi A., Muneer S., Ahmad N.(2021)	17
Busch T.(2011)	16
DenoncourtJ.(2020)	14
Brohm K.-A., Klein S.(2020)	13
Patuelli A., Caldarelli G., Lattanzi N., SaraccoF.(2021)	12

From the analysis, we can observe the following: There are multiple papers published in recent years (2020-2022) with high citation counts, indicating their relevance and impact in the field. The top three most cited papers are from 2020 and 2016, suggesting the enduring influence of those studies over time. Several papers published in 2021 have similar citation counts, indicating a common interest in their topics. Authors with multiple papers in the top 20 cited list include Gupta S., Nawaz N., Ahmad N., Naveed R.T., and Muneer S., suggesting their significant contributions to the field. The subjects covered by the top cited papers vary, covering areas such as sustainability, environmental management, and diverse business-related topics.

9 Bibliographic analysis

10 Bibliographic analysis of countries



Picture 1: Bibliographic analysis of countries

.Let's analyze the data and draw conclusions based on the provided information.

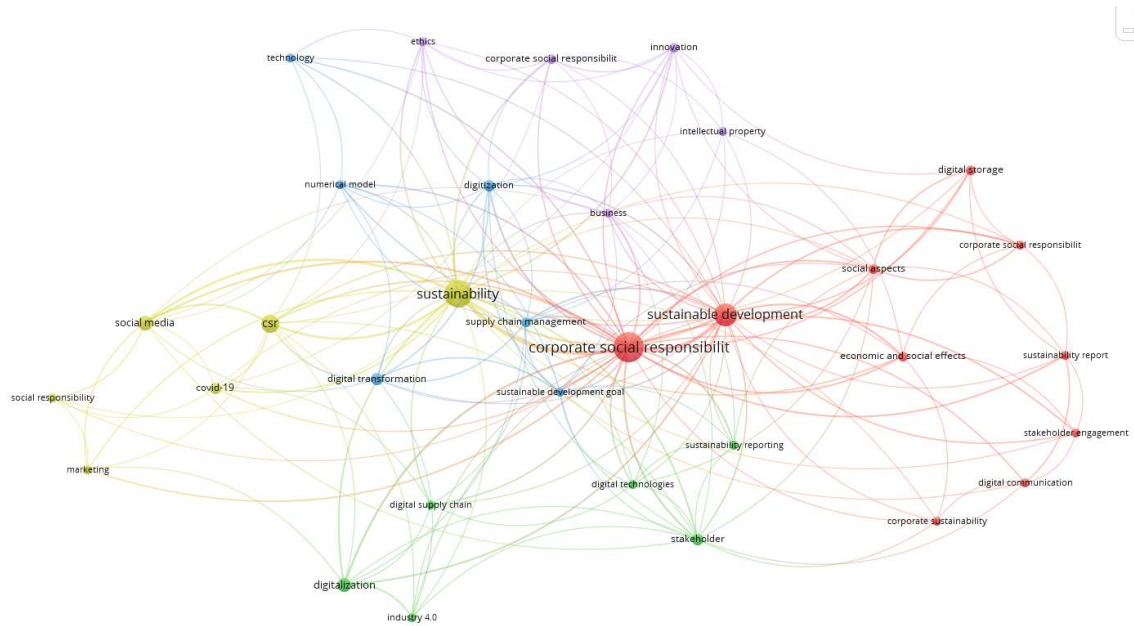
1. China: With the highest number of documents (7) and a relatively high number of citations (80), China demonstrates a strong research output in the field. The total link strength of 7 indicates a significant connection between the documents and citations, suggesting a coherent body of research.
2. Pakistan: Despite having a lower number of documents (4) compared to China, Pakistan shows a surprisingly high number of citations (119). This indicates that the research coming from Pakistan has received considerable attention and recognition from the

scholarly community. The total link strength of 7 suggests a strong connection between the documents and their citations.

3. Germany: Germany has an equal number of documents (4) as Pakistan but receives a lower number of citations (87). However, the total link strength of 6 still indicates a substantial relationship between the documents and citations, demonstrating a cohesive research output.
4. Spain: With 6 documents and 78 citations, Spain showcases a good research output. The total link strength of 5 suggests a reasonable connection between the documents and their citations.
5. Sweden: Similar to Germany, Sweden also has 4 documents, but with a lower number of citations (76). The total link strength of 5 indicates a moderate connection between the documents and their citations.
6. Switzerland and United Kingdom: Both Switzerland and the United Kingdom have 5 documents, with citations of 107 and 102, respectively. These countries exhibit a solid research output, and the total link strength of 5 suggests a strong relationship between the documents and citations.
7. Poland: Poland has 3 documents and a lower number of citations (45). The total link strength of 4 indicates a moderate connection between the documents and their citations.
8. Italy: Italy stands out with the highest number of citations (156) among all the countries, despite having 12 documents. However, the total link strength of 3 suggests that the citations might not be as strongly connected to the documents.
9. Saudi Arabia: With 4 documents and 55 citations, Saudi Arabia demonstrates a moderate research output. The total link strength of 3 indicates a moderate connection between the documents and their citations.
10. United States: The United States has 3 documents and a relatively high number of citations (90). However, the total link strength of 2 suggests a weaker connection between the documents and their citations compared to other countries.
11. Australia, South Korea, and Slovenia: These three countries have a lower research output, with 3 documents each and relatively fewer citations. The total link strength of 2 for each country suggests a weaker relationship between the documents and citations.

In conclusion, the table analysis reveals that China, Pakistan, Germany, Spain, Switzerland, and the United Kingdom demonstrate strong research outputs in terms of the number of documents and citations. Italy stands out with the highest number of citations, indicating significant recognition in the field. While some countries have fewer documents and citations, the total link strength provides insights into the connection between the research output and its impact. Overall, the data highlights the varying research strengths of different countries and the importance of collaboration and linkages between documents and citations to establish a robust body of research.

11 Bibliographic analysis of keywords



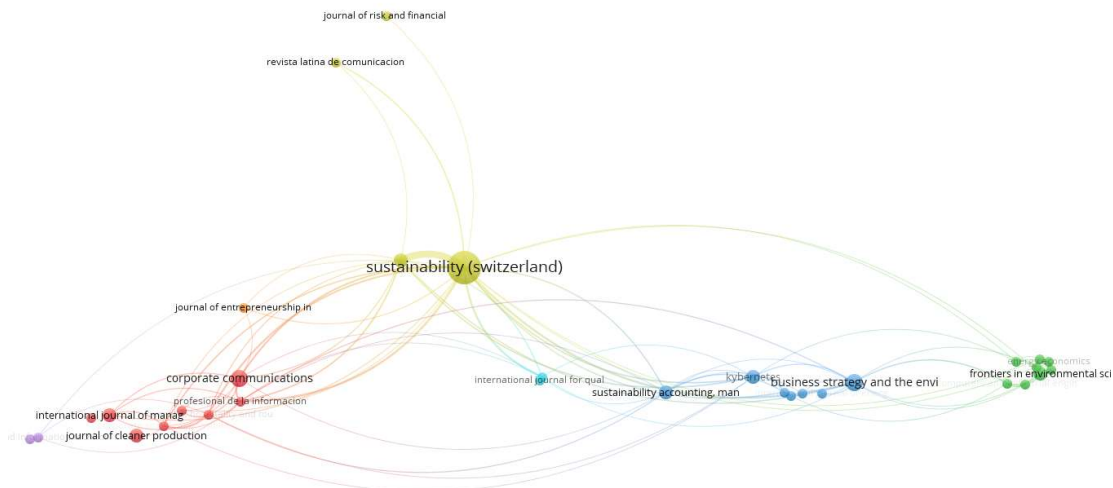
Picture 2: indicates the co-occurrence analysis of keywords
The conclusions based on the provided information.

1. Corporate Social Responsibility (CSR): The keyword "corporate social responsibility" appears most frequently, with 33 occurrences. This indicates that CSR is a widely discussed and researched topic. Additionally, it has a high total link strength of 103, suggesting that there is a strong connection between the occurrences of this keyword and the associated content.
2. Sustainability: The keyword "sustainability" has 28 occurrences, indicating that it is a prominent and frequently studied concept. The total link strength of 87 suggests a substantial relationship between the occurrences and the associated content.
3. Sustainable Development: Although the keyword "sustainable development" appears fewer times (19) compared to CSR and sustainability, it still represents a significant research area. However, the relatively lower total link strength of 6.2 indicates that the connection between the occurrences and associated content is weaker compared to other keywords.
4. CSR (Abbreviation): The abbreviation "CSR" appears 12 times, indicating its common usage. It has a total link strength of 28, suggesting a reasonable connection between the occurrences and the associated content.
5. Social Media: The keyword "social media" appears 8 times, highlighting the growing interest in studying the impact of social media on various aspects. The total link strength of 26 suggests a moderate connection between the occurrences and the associated content.
6. Stakeholder: The keyword "stakeholder" appears 5 times, indicating its relevance in discussions about businesses and their relationships with different stakeholders. The total link strength of 21 suggests a moderate connection between the occurrences and the associated content.

7. Digitization and Digitalization: Both "digitization" and "digitalization" have 5 occurrences each. These keywords reflect the increasing focus on the digital transformation of business processes. The total link strengths of 19 and 18, respectively, indicate moderate connections between the occurrences and the associated content.
8. Business: The keyword "business" appears 3 times, suggesting a more general and broad category of research. The total link strength of 18 indicates a moderate connection between the occurrences and the associated content.
9. Social Aspects: The keyword "social aspects" appears 4 times, indicating a specific focus on social dimensions within the context of the research. The total link strength of 18 suggests a moderate connection between the occurrences and the associated content.
10. Digital Transformation and Innovation: Both "digital transformation" and "innovation" have 6 occurrences each. These keywords highlight the importance of technology-driven changes in business and the need for innovative approaches. The total link strengths of 16 for both keywords suggest moderate connections between the occurrences and the associated content.
11. Supply Chain Management and Sustainable Development Goal: These keywords appear 4 times each, indicating their relevance in discussions about sustainable business practices. The total link strengths of 16 suggest moderate connections between the occurrences and the associated content.
12. Other Keywords: The remaining keywords, such as "corporate social responsibility (CSR)," "economic and social effects," "ethics," "numerical model," and "COVID-19," have lower occurrences and total link strengths. This indicates that they may represent more specific or emerging research areas within the broader context of the topic.

In conclusion, the table analysis reveals that corporate social responsibility, sustainability, and digitalization/digitization are the most frequently discussed topics based on the occurrences of the respective keywords. These topics also exhibit relatively higher total link strengths, indicating stronger connections between the occurrences and the associated content. While less frequent, the other keywords still represent important research areas within the broader context. Overall, the data highlights the key themes and areas.

12 Bibliographic coupling analysis of source



Picture 3: Indicates the Bibliographic coupling of the source.

The information on the occurrences and total link strength of various keywords. Let's analyze the data and draw conclusions based on the provided information.

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8. Business: The keyword "business" appears three times, suggesting a more general and broad research category. The total link strength of 18 indicates a moderate connection between the occurrences and the associated content.
9. Social Aspects: The keyword "social aspects" appears four times, indicating a specific focus on social dimensions within the context of the research. The total link strength of 18 suggests a moderate connection between the occurrences and the associated content.
10. Digital Transformation and Innovation: Both "digital transformation" and "innovation" have six occurrences each. These keywords highlight the importance of technology-driven changes in business and the need for innovative approaches. The total link strengths of 16 for both keywords suggest moderate connections between the occurrences and the associated content.
11. Supply Chain Management and Sustainable Development Goal: These keywords appear four times each, indicating their relevance in discussions about sustainable

business practices. The total link strengths of 16 suggest moderate connections between the occurrences and the associated content.

12. Other Keywords: The remaining keywords, such as "corporate social responsibility (CSR)," "economic and social effects," "ethics," "numerical model," and "COVID-19," have lower occurrences and total link strengths. This indicates that they may represent more specific or emerging research areas within the broader context of the topic.

In conclusion, the table analysis reveals that corporate social responsibility, sustainability, and digitalization/digitization are the most frequently discussed topics based on the occurrences of the respective keywords. These topics also exhibit relatively higher total link strengths, indicating stronger connections between the occurrences and the associated content.

13 RESEARCH IMPLICATIONS

The impact of digitalization in business goes beyond simply enabling transparency; it also enhances speed and efficiency. Digitalization plays a crucial role in transforming the perception of management, affecting how it performs daily functions and emphasizes systematic procedures for data maintenance. With digitalization, management can make sustainable business decisions, promote environmental, social, and governance (ESG) practices, and facilitate sustainable investment decisions.

Disclosing management practices using digital means can yield superior results compared to competitors. The benefits of digital technology extend to reducing capital costs and various risks (Alicke & Strigel, 2020; Al-Tuwaijri et al., 2004). Implementing digital tools can enhance operational efficiency, improve the corporate image, and positively impact financial results. Technologies such as artificial intelligence (AI), big data, blockchain, financial and service assistance apps, and software can enhance management practices and financial performance (Baabdullah et al., 2021; Malik et al., 2022).

Digitalization of business practices into sustainable management practices involves integrating technology at every level of management. Sustainable business practices carefully evaluate management practices and incorporate digitalization to provide long-term benefits, boost environmental awareness, address social implications, and foster good governance (Abueed & Aga, 2019; Birindelli & Palea, 2023). Integrating digitalization and sustainable business offers numerous advantages to organizations, including cost reduction, increased efficiency, and improved environmental outcomes.

There are several ways to merge digitalization with sustainable business practices:

1. Utilize smart technology: Employing smart devices like energy-efficient lighting, smart thermostats, and occupancy sensors can reduce energy consumption and improve environmental stability (Mishra et al., 2023).
2. Cloud-based computing: Leveraging cloud technology allows organizations to access and share data remotely, reducing the need for physical storage or transportation of documents and decreasing paper usage (Gangwar et al., 2015).
3. Virtual meetings: Utilizing video conferencing and collaboration tools for virtual meetings reduces the need for travel, saving time and money while minimizing environmental impact (Ahmad Amouei et al., 2023).
4. Digital supply chain management: Digitalizing the supply chain helps organizations track and reduce waste, optimize inventory, and improve sustainability practices.

5. Data analysis: Analyzing data from various sources enables organizations to identify areas where they can improve sustainability practices, such as reducing waste, improving energy efficiency, and transitioning to renewable energy sources(Bingham & Walters, 2013; Choi et al., 2020).

By integrating digitalization and sustainable business practices, organizations can achieve greater efficiency, cost reduction, and promote environmental sustainability for a more sustainable future. These strategies enable businesses to embrace innovation, leverage technological advancements, and drive positive change toward a greener and more socially responsible business environment.

Few takeaways, and the way forward includes.

1. Identifying Digitalization Practices for Sustainable Business: The literature review highlights the need to study and identify specific digitalization practices that can be merged with sustainable business practices(Bondarenko et al., 2022; Hackius & Petersen, 2017; Moşteanu et al., 2020). This research implication suggests conducting empirical studies to explore the different digital tools, technologies, and strategies organizations employ to enhance sustainability in their operations. Understanding these practices can provide insights into effective digitalization strategies to achieve sustainable business goals.
2. Blending Digitalization with Sustainable Business Practices: Another research implication is to investigate how digitalization can be blended with sustainable business practices. This implies examining the integration of digital tools and technologies into existing sustainable business strategies and frameworks. By exploring case studies and conducting empirical research, scholars can uncover the synergies, challenges, and best practices of integrating digitalization and sustainability to drive organizational performance and societal impact(Bondarenko et al., 2022; Moşteanu et al., 2020).
3. Understanding the Impact of Digitalization on Sustainable Business Practices: The literature review suggests the need to understand the impact of digitalization on sustainable business practices. This research implication involves exploring the effects of digital technologies, such as data analytics, Internet of Things (IoT), artificial intelligence, and blockchain, on the implementation and outcomes of sustainable business strategies(Baabdullah et al., 2021; Malik et al., 2022). Scholars can investigate how digitalization contributes to increased transparency, efficiency, and effectiveness in achieving sustainability goals.

14 Answering the Research Questions:

1. Digitalization Practices Merged with Sustainable Business Practices: This research question aims to identify and analyze the specific digitalization practices that organizations have incorporated into their sustainable business strategies. It involves examining the digital tools, technologies and approaches companies employ to enhance sustainability performance and address social and environmental challenges(Fan et al., 2023; Bai & Sarkis, 2020).
2. Increasing Transparency and Efficiency through Digitalization: The second research question focuses on understanding how digitalization improves transparency and enhances the efficiency of sustainable business practices. This involves investigating

the mechanisms through which digital technologies enable organizations to collect, analyze, and communicate sustainability-related data, and how these practices contribute to better decision-making and performance(Bondarenko et al., 2022).

3. Improving Sustainable Practices through Digitalization: The third research question explores how digitalization can contribute to the improvement of sustainable practices. This includes examining the role of digital technologies in promoting sustainable decision-making, facilitating ESG (environmental, social, and governance) practices, enabling sustainable investment decisions, and enhancing data management in a more systematic and methodological manner(Li et al., 2022).

15 Managerial implications

1. Embrace Digitalization for Sustainable Business: Managers should recognize the importance of digitalization in driving sustainable business practices. They need to understand the potential benefits of integrating digital tools and technologies into their operations, including improved transparency, efficiency, and decision-making(Bai & Sarkis, 2020; Mishra et al., 2023). By embracing digitalization, managers can enhance their organization's sustainability performance and gain a competitive advantage in the market.
2. Invest in Digital Skills and Capabilities: To effectively leverage digitalization for sustainable business, managers should invest in developing digital skills and capabilities within their workforce. This may involve training employees on digital tools and technologies, fostering a digital mindset, and creating a culture of innovation and continuous learning(Dehghani et al., 2022). By equipping employees with the necessary digital skills, organizations can navigate the complexities of digital transformation and implement sustainable practices more effectively.
3. Foster Collaboration and Partnerships: Managers should recognize the importance of collaboration and partnerships in leveraging digitalization for sustainable business. They should actively seek opportunities to collaborate with external stakeholders, such as technology providers, NGOs, and industry associations, to access expertise, resources, and innovative solutions(Fan et al., 2023). By fostering collaboration, managers can accelerate the adoption of digital practices and drive collective efforts towards sustainability goals.
4. Align Digitalization with Sustainability Strategy: To maximize the impact of digitalization, managers need to align digital initiatives with their organization's sustainability strategy. This involves identifying areas where digital tools and technologies can address specific sustainability challenges and contribute to the achievement of sustainability targets(Metawa et al., 2022). By aligning digitalization with sustainability goals, managers can ensure that digital initiatives are purposeful, impactful, and aligned with the overall strategic direction of the organization.
5. Monitor and Evaluate Digitalization Efforts: Managers should establish mechanisms to monitor and evaluate the effectiveness of digitalization efforts in driving sustainable business practices. This may include defining key performance indicators (KPIs) related to sustainability and digitalization, collecting and analyzing relevant data, and periodically reviewing the progress and outcomes of digital initiatives(Malik et al.,

2022). By monitoring and evaluating digitalization efforts, managers can identify areas for improvement, optimize resource allocation, and demonstrate the value of digitalization in achieving sustainability objectives.

6. **Stay Updated on Emerging Digital Trends:** Given the rapid pace of technological advancements, managers should stay updated on emerging digital trends that can impact sustainable business practices. This requires actively scanning the external environment, monitoring industry developments, and engaging in continuous learning and professional development (Samylovskaya et al., 2022). By staying informed about emerging digital trends, managers can identify new opportunities, anticipate challenges, and proactively adapt their strategies to remain at the forefront of sustainable digital innovation.

16 Academic contributions

1. **Advancing Knowledge on Digitalization and Sustainability:** The literature review presents academic implications by highlighting the need for further research and knowledge development in the field of digitalization and sustainability. Scholars can contribute to the academic literature by conducting empirical studies, theoretical analyses, and case studies that deepen our understanding of how digital technologies can be effectively integrated into sustainable business practices (Samylovskaya et al., 2022). This can help build a robust body of knowledge on the topic and contribute to theory development in the domains of digitalization, sustainability, and their intersection.
2. **Bridging the Gap between Theory and Practice:** The research implications emphasize the importance of bridging the gap between theoretical concepts and practical implementation. Academic researchers can play a crucial role in developing frameworks, models, and guidelines that help organizations effectively incorporate digitalization into their sustainability strategies (Almeida et al., 2020; Bondarenko et al., 2022). By focusing on practical implications and providing actionable insights, scholars can facilitate the adoption and implementation of sustainable digital practices by organizations across various industries and sectors.
3. **Interdisciplinary Collaboration:** The intersection of digitalization and sustainability requires interdisciplinary collaboration among researchers from various fields, including management, technology, environmental studies, and social sciences. Academic institutions can encourage and facilitate interdisciplinary research collaborations to explore the multifaceted aspects of digitalization and sustainability (Dubey et al., 2020b; Giri & Manohar, 2021). This can lead to comprehensive insights into the complex relationships, impacts, and trade-offs associated with the integration of digital technologies into sustainable business practices.
4. **Methodological Advancements:** The research implications call for methodological advancements in studying the relationship between digitalization and sustainability. Scholars can explore innovative research methods and techniques that allow for the analysis of large-scale data sets, complex systems, and dynamic interactions (Bason & Anagnostopoulos, 2015). The use of mixed-method approaches, longitudinal studies,

and comparative analyses can provide a more comprehensive understanding of the effects of digitalization on sustainability outcomes and help uncover potential causal relationships.

5. Policy and Governance Recommendations: Academic research can contribute to the development of policy recommendations and governance frameworks that promote the responsible and effective use of digital technologies in sustainable business practices. Scholars can analyze the regulatory landscape, identify gaps, and propose guidelines for policymakers to create an enabling environment for digital sustainability initiatives (Abdul-Salam, 2022; Allen, 2005). This can foster innovation, encourage collaboration, and ensure ethical and responsible use of digital technologies in driving sustainable development.

17 Limitations and future directions

18 Limitations:

1. Limited Scope of Literature Review: The literature review conducted in this study was based on a selected set of 67 research papers. While these papers cover a range of topics related to digitalization and sustainable business practices, the review may not capture all relevant studies in the field. Therefore, the findings and conclusions drawn from this review should be interpreted within the context of the selected literature.
2. Lack of Consistent Terminology: The literature on digitalization and sustainability is characterized by a lack of consistent terminology and conceptual frameworks. Different authors and disciplines may use varied terms and definitions, which can lead to confusion and make it challenging to compare and synthesize the findings. This limitation underscores the need for future research to establish common terminology and conceptual clarity in this field.
3. Limited Generalizability: The reviewed papers may have focused on specific industries, regions, or organizational contexts, which could limit the generalizability of the findings. The impact of digitalization on sustainable business practices may vary across different sectors and organizational settings. Therefore, caution should be exercised when applying the findings of this review to diverse contexts.

19 Future Directions:

1. Longitudinal Studies: Conducting longitudinal studies can provide a deeper understanding of the long-term effects and evolution of digitalization on sustainable business practices. By observing organizations over an extended period, researchers can analyze how digitalization initiatives unfold, identify potential challenges and opportunities, and assess the outcomes and impacts of digital transformation on sustainability performance.
2. Comparative Studies: Comparative studies can contribute to a more comprehensive understanding of the effectiveness of different digitalization practices in driving sustainable business outcomes. By comparing organizations with varying levels of digitalization and sustainable practices, researchers can identify best practices, determine the key success factors, and develop guidelines for organizations seeking to integrate digital technologies into their sustainability strategies.

3. **Interdisciplinary Research:** Given the multifaceted nature of digitalization and sustainability, future research should embrace an interdisciplinary approach. Collaboration between scholars from various fields, such as management, information systems, environmental science, and sociology, can provide diverse perspectives and facilitate a holistic understanding of the complex interactions between digitalization and sustainable business practices.
4. **Impact Assessment Frameworks:** Developing robust frameworks for assessing the impact of digitalization on sustainable business practices is crucial. These frameworks should incorporate key indicators, such as environmental performance, social impact, economic outcomes, and governance practices, to comprehensively evaluate the effectiveness and sustainability of digitalization initiatives.
5. **Case Studies and Best Practices:** Conducting in-depth case studies and identifying best practices can offer valuable insights for organizations embarking on their digitalization journey. These studies can examine successful examples of organizations that have effectively integrated digital technologies into their sustainability strategies and identify the critical factors contributing to their success.
6. **Ethical Considerations:** As digitalization advances, ethical considerations become increasingly important. Future research should explore the ethical implications of digitalization in sustainable business practices, including issues related to data privacy, security, algorithmic bias, and social implications. Understanding and addressing these ethical concerns is essential to ensure the responsible and sustainable use of digital technologies.

20 CONCLUSION

This study has shed light on the relationship between digitalization and sustainable business practices. Over the past decade, sustainability has become an integral part of management practices in organizations worldwide, and digitalization has emerged as a powerful tool to support and enhance sustainable business strategies (Moşteanu et al., 2020). The review highlights that digitalization plays a crucial role in developing standards, procedures, and codes related to sustainable management practices. By leveraging digital tools and technologies, organizations can adopt more transparent, efficient, and systematic approaches to sustainability. The impact of digitalization extends beyond improved practices; it also influences the perception of management itself, transforming how it operates, performs functions, emphasizes systematic procedures, manages data, and solves problems.

Blending digitalization with management practices leads to stronger governance, as organizations can leverage technology to drive sustainable decision-making, promote ESG practices, and maintain data in a more methodological and systematic manner. This integration allows for increased transparency and efficiency, contributing to organizational success in achieving sustainability goals. The research implications derived from the literature review highlight the need for further study in several areas. Firstly, there is a need to identify and understand specific digitalization practices that can be merged with sustainable business practices. This involves exploring the various digital tools, technologies, and strategies employed by organizations to enhance sustainability. Secondly, researchers should investigate the integration of digitalization and sustainable business practices to uncover the synergies,

challenges, and best practices (Mishra et al., 2023). Lastly, understanding the impact of digitalization on sustainable business practices is crucial to assess how digital technologies contribute to increased transparency, efficiency, and effectiveness in achieving sustainability goals.

By addressing these research implications and questions, scholars can contribute to advancing knowledge in the field and provide valuable insights for organizations and policymakers. The findings can guide organizations in leveraging digitalization to drive sustainable business decisions, promote responsible practices, and enhance their overall performance. Embracing digitalization as a catalyst for sustainability can create a positive impact on both business and society, paving the way for a more sustainable and inclusive future.

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