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Sustainable IT Adoption in Organizations: A Systematic Literature Review

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Abstract:
Sustainable IT has become a key strategy for minimizing digital technology's negative environmental effects while preserving operational effectiveness. This paper aims to study the effect of sustainable IT adoption in organizations through a Systematic Literature Review. This review study includes research papers from the year 2020-2024 and the papers were extracted from the Scopus database. An initial search of 1130 articles were identified with the determined keywords such as Sustainable Information Technology, Green IT and Sustainable IT. Records identified were filtered and limited on the basis of Subject area (Business, Management and Accounting), Document type (Articles), Language (English). Based on the objectives of the study, 7 research papers were included for the review incorporating a PRISMA framework. The findings of the study reveal that organizational opposition, regulatory obstacles, and high implementation costs are preventing the widespread adoption of sustainable IT, despite the fact that it offers substantial operational and environmental benefits. But new technologies like cloud computing, blockchain, and artificial intelligence (AI) provide workable answers by improving resource usage and energy efficiency. Sustainable IT practices can be widely adopted more quickly if these issues are resolved by organizational strategy, technology developments, and policy initiatives.

Keywords: Sustainable Information technology, Green Information technology, Sustainable IT, Green IT, SLR, Systematic Literature Review, PRISMA

INTRODUCTION

In an age of swift technological development, information technology's (IT) contribution to sustainability has drawn a lot of attention. Sustainable IT, the term for the integration of sustainable practices in IT, attempts to lessen the environmental impact of digital technology without sacrificing effectiveness or creativity. Adopting eco-friendly practices has become essential as companies and organizations depend more and more on IT to run their operations. Energy-efficient computing, green data centres, eco-friendly software development, and ethical e-waste management are just a few of the tactics that make up sustainable IT. New technologies that optimize energy consumption and encourage resource efficiency, like cloud computing, blockchain, and artificial intelligence (AI), are essential to the advancement of sustainable IT. Organizations must overcome a number of obstacles when putting sustainable IT solutions into practice, such as large upfront expenditures, ignorance, complicated regulations, and change aversion. It is crucial to comprehend these obstacles in order to create tactics that promote broad adoption.

This paper offers a thorough overview of the literature on sustainable IT, looking at previous studies, pointing out important problems, and suggesting possible directions for further investigation. This study

attempts to shed light on how businesses can use digital transformation to accomplish sustainability objectives while overcoming implementation obstacles by combining the results of several studies. The review's conclusions add to the expanding conversation about sustainable IT and lay the groundwork for further study and the creation of relevant policies.

METHODOLOGY

Review procedure

A scientific approach for assessing and analysing all available study findings that are pertinent to a particular research question or subject area is a systematic literature review (SLR). As a result, all available research findings are gathered, compiled, and assessed. The previously published scientific literature serves as the foundation for an SLR (Hinderks et al., 2020)This paper presents a Systematic Literature Review, or SLR, and lists the procedural processes that must be followed in order to guarantee a fair and accurate assessment of the literature. It also contains several crucial components. (Cabrera et al., 2023)

PRISMA procedure

Preferred Reporting Items for Systematic reviews and Meta-Analyses was developed in 2005 by David Moher and his colleagues in their medical article. PRISMA statements comprise four steps: Identification, Screening, Eligibility and Inclusion criteria. First, the objectives of the study were formulated. As per these objectives, the answers to the research questions are searched. In this literature search, Academic database as in Scopus were looked into with the determined keywords. The literature texts that are pertinent to the study are being reviewed for eligibility, and those that falls under the eligibility criteria are included for the review.

Research Questions

The main aim of the study is to know the role of emerging technologies in promoting Sustainable IT and the challenges faced in adopting sustainable IT in organizations. Based on these objectives, the following research questions were formulated.

1. How do cutting-edge technologies like blockchain, cloud computing, and artificial intelligence contribute to the advancement of sustainable IT?
2. What obstacles do businesses encounter when implementing sustainable IT solutions?
3. What possible fields of study can improve the uptake and effects of sustainable IT?

Search strategy

Relevant literature for the systematic search method was identified as the focused result for the study. The search method used a single database, namely Scopus. All the searches were conducted between 2020 and 2024 and they included only articles that are published in English only. Boolean operators like OR and AND were used along with the determined keywords to search for the relevant literature. The following table shows the search string for the study.

Table 1: Search String

Scopus	TITLE-ABS-KEY ("sustainable information technology" OR “sustainable IT” OR “green information technology”)

Screening

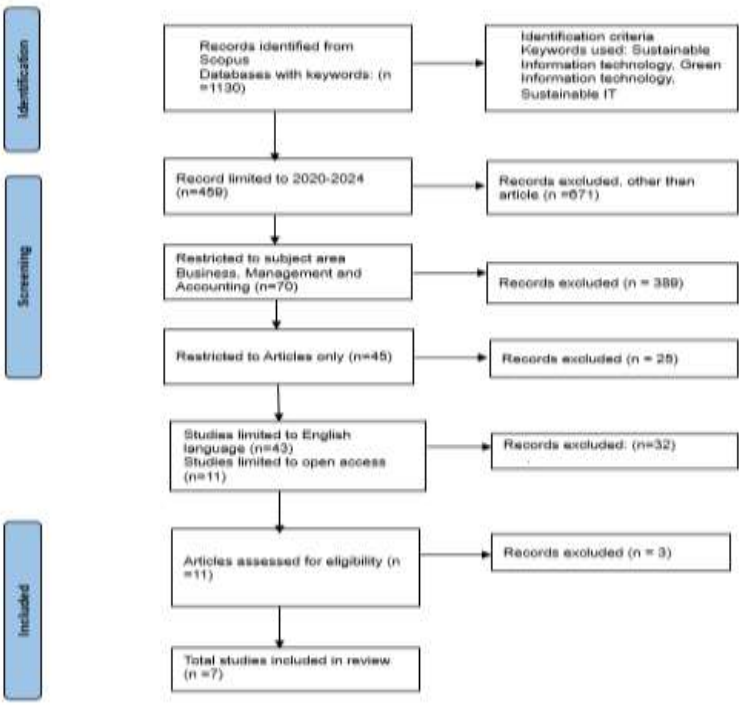
All the search results using the search string is filtered by Publication year, Subject area, Document type, Language, and Open Access. The following table shows the inclusion and exclusion criteria for choosing the relevant literature for the systematic search method.

Table 2: Inclusion and Exclusion Criteria

Criterion	Inclusion	Exclusion
Publication Year	2020-2024	<2020
Subject area	Business, Management, and Accounting	Arts and Humanities Decision Sciences Economics, Econometrics, and Finance Psychology, Social Sciences
Document type	Articles	Conference review, book chapter, editorial etc
Language	English	Non-English

A set of inclusion and exclusion criteria has been developed to guarantee a methodical and pertinent selection of literature for this Systematic Literature Review (SLR) on Sustainable IT. Since they represent the most recent developments and new trends in Sustainable IT, only research released between 2020 and 2024 are taken into account. In order to avoid out-of-date ideas that would not be relevant in the present managerial and technical environment, older studies specifically, those published before 2020 are disqualified. Business, management and accounting are the subject areas chosen for inclusion. Only English-language publications are featured. The PRISMA flowchart for the study is shown in figure 1.

Figure 1: PRISMA flow chart



RESULTS

RQ. 1: How do cutting-edge technologies like blockchain, cloud computing, and artificial intelligence contribute to the advancement of sustainable IT?

Emerging technologies that improve efficiency, optimize resource use, and lessen environmental impact—like blockchain, cloud computing, and artificial intelligence (AI)—are essential to the advancement of sustainable IT. AI helps by enabling predictive maintenance, automating procedures, lowering waste, and optimizing energy usage. This prolongs the life of equipment and promotes environmentally friendly decision-making (Arulrajah et al., 2020; Jiang et al., 2022; van Wynsberghe, 2021) Cloud computing reduces carbon footprints and the need for physical hardware by facilitating scalability and flexibility in IT infrastructure. It also makes remote work possible and allows for effective data storage for green initiatives (Jiang et al., 2022; Valmohammadi & Mortaz Hejri, 2023) In addition to supporting decentralized energy systems and secure data management, blockchain improves supply chain transparency and traceability, guaranteeing sustainable compliance and responsible sourcing ((Jiang et al., 2022; van Wynsberghe, 2021). Additionally, these technologies reinforce sustainable digital transformation across industries by supporting financial risk assessment, green technology innovation, and cooperative efforts in manufacturing and IT services (Feng et al. The table 3 below shows the detailed profile of the articles considered for the study.

Title	Author	Year	Country	Methodology
Green Information Technology and Environmental Performance of the Banks	Arulrajah et al.	2020	Sri Lanka	Quantitative
Sustainable AI: AI for Sustainability and the Sustainability of AI	Wynsberghe et al	2021	Romania	Secondary Qualitative
Does Green Finance Promote Enterprises' Green Technology Innovation in China?	Jiang et al.	2022	China	Quantitative
Environmental Decentralization, Digital Finance and Green Technology Innovation	Feng et al.	2022	China	Quantitative
Green Energy as A New Determinant of Green Growth in China: The Role of Green Technological Innovation	Jiaman Li et al.	2022	China	Quantitative
Designing a Conceptual Green Process Model in Software Development: A Mixed Method Approach)	Alessia Zoppelletto et al.	2023	Iran	Mixed method
How Does the Green Competitive Advantage of	Hendarjanti et al.	2023	Indonesia	Quantitative

Building a Sustainable Palm Oil Industry? The Role of Green Innovations as a Mediation				

Table 3: Profile of articles considered for the study

RQ 2: What obstacles do businesses encounter when implementing sustainable IT solutions?
Financial restrictions are a major obstacle to organizations' adoption of sustainable IT solutions, since the high initial costs of implementation typically discourage investment (Feng et al., 2022). Furthermore, adopting sustainable technologies can be challenging due to compatibility problems when integrating them with legacy systems (Jiang et al., 2022; Ostermann et al., 2021). Companies' ability to successfully adopt green initiatives is further hindered by a lack of knowledge and experience in Sustainable IT, and the transition process is slowed by cultural reluctance to change (van Wynsberghe, 2021). Organizations must manage diverse sustainability standards and legal requirements across different locations, which adds another layer of complexity to regulatory and compliance difficulties (Arulrajah et al., 2020),To remove these obstacles and enable a more seamless transition to sustainable IT solutions, supportive legislative frameworks, personnel training, and smart budgetary planning are needed.
RQ 3: What possible fields of study can improve the uptake and effects of sustainable IT?
To increase its uptake and long-term effects, future studies on sustainable IT should focus on a few key aspects. Examining how to include cutting-edge technologies like artificial intelligence (AI), blockchain, cloud computing, and the Internet of Things (IoT) could enhance organizational effectiveness and offer creative answers to sustainability problems ((Jiang et al., 2022; Li et al., 2022)). Businesses moving to greener IT infrastructures can benefit from best practices and insights gained from conducting in-depth case studies on successful implementations ((Jiang et al., 2022; Valmohammadi & Mortaz Hejri, 2023)). Effective policymaking and incentive structures can also be shaped by looking at how government policies and regulatory frameworks support the adoption of sustainable IT ((Feng et al., 2022; van Wynsberghe, 2021). Future research ought to evaluate the socio-technical aspects of sustainable IT adoption, emphasizing organizational culture, human behavior, and change resistance, as these factors have a big impact on adoption rates ((Jiang et al., 2022)). Organizations may be further encouraged to engage in green technologies by developing standardized frameworks for sustainability assessments and cost-benefit analysis models that quantify the long-term financial and environmental benefits ((Arulrajah et al., 2020)). The advancement of Sustainable IT will require a multidisciplinary research strategy that combines economics, environmental science, and technology.

CONCLUSION

Sustainable IT offers businesses a crucial method to strike a balance between environmental responsibility and technical advancement. The advantages of adopting sustainable IT practices, such as less environmental impact and long-term cost savings, exceed the obstacles, which include organizational resistance, regulatory obstacles, and budgetary limitations. New developments in cloud computing, blockchain, and artificial intelligence (AI) present new ways to improve IT operations' sustainability. Standardized frameworks, the economic viability of sustainable IT, and the function of policy interventions in encouraging the use of green technologies should be the main areas of future research. By

tackling these issues, businesses can shift to more environmentally friendly IT procedures, helping to create a more productive and sustainable digital future.

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