

## SPECIAL FOCUS PAPER

# A Comprehensive Bibliometric Study on Exploring the Frontier of Artificial Intelligence Sustainability in Business

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**ABSTRACT**

The aim of the study is to investigate features of the current literature on how businesses have adopted AI to develop sustainable models and processes that comprise types of publications, volumes, keywords related to the study, and areas of theme. The paper shall also determine the countries that have been conducting research on AI sustainability in business by searching articles contained in the Scopus database between the years 2008–2025 using the search keys AI sustainability in business. Scopus was selected as the main tool of literature search because it is the largest indexed database in the business sphere and covers all the commercial journals. VOSviewer will be used to conduct a bibliometric analysis that would allow drawing up a map of research trends and a research network of the authors of the identified articles. According to the findings of this study, the most considerable five countries on the number of co-authored articles included Italy, China, Cyprus, the Russian Federation, and Thailand. The overall number of various keywords that were utilized in the papers analyzed in Scopus was 84, but the most common keywords that were shared by both articles were: artificial intelligence (AI) and sustainability. The study offers a complete overview of the worldwide research landscape on AI sustainability in the business sphere and will serve as a reference point for future research in the same field. The investigation will also contribute to the existing literature by being a distinct bibliometric review model and hence offer a point of view that is not similar to the traditional systematic literature review techniques.

**KEYWORDS**

bibliometric analysis, artificial intelligence (AI), business, sustainability, sustainable growth, Scopus database

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## 1 INTRODUCTION

As the field of artificial intelligence (AI) technologies is emerging rapidly, [1] has made a massive survey among about 20,000 adults in over 25 countries to determine how people view the positive and negative effects of AI usage. The results have indicated that more than half of the people in nations like China, Saudi Arabia, India, Peru, Malaysia, and Italy had a positive attitude towards AI implementation and believed that the advantages of AI use outweighed its possible drawbacks (refer to Table 1). Another survey by [2] that surveyed 22,000 adults in 31 countries also supports these results, as it was an interview-based survey. AI is seen as a driving force to help the United Nations Sustainable Development Goals (SDGs) be reached, and it is increasingly recognized as an entity that will change the world by rapidly improving efforts [14].

A recent study by Google (2024) finds that about half of the workforce—51%—which believes that their productivity will increase as a result of AI over the next five years [3]. As companies adjust to this rapid change, developing business models aligned with long-term sustainable development frameworks will be an important aspect of future growth [38]. As businesses make this transition, their emphasis will be on developing “Green AI” that will reduce the environmental impacts of expanding digitally [16]. The way technology is working is changing. It is moving away from being about making things more efficient, like it was with Industry 4.0. Now it is more about people. Being sustainable is what Industry 5.0 is all about. AI is a part of this change, helping us to be more responsible with what we consume and produce, which is one of the SDGs. SDG 12. AI is really important for achieving this goal [29]. Also, the new kind of AI that can create things is giving us a way to think about how AI can be used for good. This means we can use these AI models to come up with sustainable ways of doing business [30].

In this study it stated that, on average, 54% of the people who were surveyed felt that the introduction of AI in products and services would bring more benefits than harm. It is interesting to note that this percentage in Indonesia was as much as 78% among the respondents. Also, the survey found that 54% of the respondents were excited by the prospect of the use of AI to provide services and products.

**Table 1.** Global public sentiment towards AI benefits more than drawbacks

Country	Agree (%)	Country	Agree (%)
China	78%	Spain	53%
Saudi Arabia	76%	Italy	50%
India	71%	Hungary	49%
Peru	70%	Poland	48%
Malaysia	65%	Japan	42%
Mexico	65%	Sweden	40%
Colombia	64%	Belgium	38%
Chile	63%	UK	38%
South Korea	62%	Australia	37%
Turkey	60%	Germany	37%

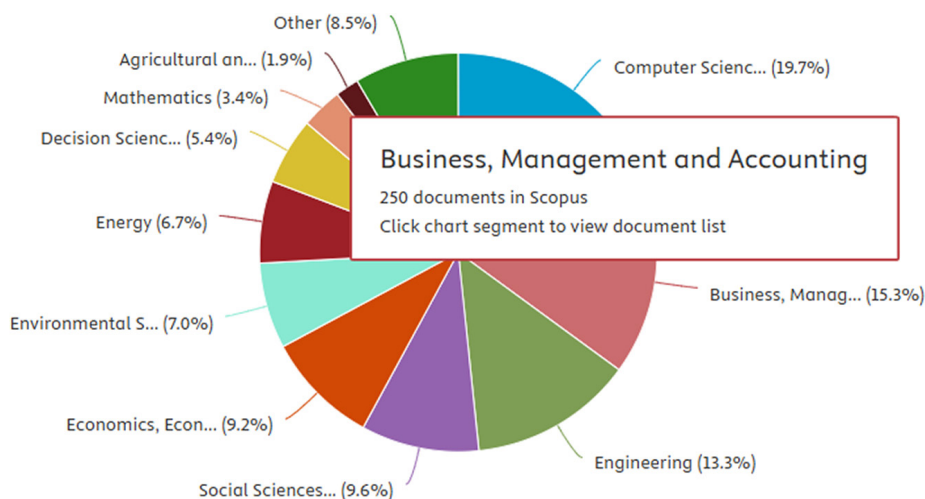
*(Continued)*

**Table 1.** Global public sentiment towards AI benefits more than drawbacks (Continued)

Country	Agree (%)	Country	Agree (%)
Brazil	57%	United States	35%
South Africa	57%	Netherlands	33%
Argentina	55%	Canada	32%
Russia	53%	France	31%

Source: [15].

In the recent past, a survey on AI taken by Google in partnership with Ipsos on more than 17,000 individuals in 17 countries was carried out. The findings suggested that 54% of the surveyed people all over the world thought AI would be beneficial to them, 68% of the surveyed respondents said that they felt more enthusiastic when exposed to AI-enabled technologies, and 51% of the employees estimated that AI would majorly influence work productivity and efficiency in the next five years [11]. Considering these results, there has been an increase in the number of studies discussing the sustainability of AI implementation in business processes.



**Fig. 1.** Subject areas of AI sustainability in business research have been implemented

Source: Generated by authors, 2026.

A review of the publications indexed in the Scopus database (2025) shows that most of the literature on AI sustainability in business practices (see Figure 1) is classified within the Computer Science discipline (19.7%), then within Business, Management and Accounting (15.3%), and the accounting field (13.3%), that comprise about 250 documents. On the contrary, the number of cited research works by the Agricultural Sciences and Mathematics disciplines is comparatively lower and constitutes 1.9% and 3.4% of all publications, respectively. Such underrepresented spaces can be utilized in future studies as a source of research.

In spite of increased publication amounts, there is still rather limited literature around detailed studies that look at particular business practices as they pertain to AI sustainability. Since AI is still considered a frontier research field, there is a great potential for more focused and practice-based studies. In that regard, the proposed study will add to the current literature by making a bibliometric review, which will offer empirical evidence on the sustainability of AI in business settings,

based on the data retrieved in the Scopus database. In addition, the findings are also useful resources in future research since they provide a thorough background on literature worldwide, thus making it easier to conduct research projects in different regions and assist in the development of high-quality research in this developing area.

### 1.1 Research questions

1. What are the number of existing studies related to AI Sustainability in Business Practice that have been published on the Scopus database?
2. Which countries have the most publications related to AI Sustainability in Business Practice on the Scopus database?
3. What keywords can be found in the studies related to AI Sustainability in Business Practice on the Scopus database?

### 1.2 Research objectives

1. To determine the number of existing studies related to AI Sustainability in Business Practice that have been published on the Scopus database.
2. To determine the countries that have the most publications related to AI Sustainability in Business Practice on the Scopus database.
3. To determine the keywords that can be found in the studies related to AI Sustainability in Business Practice on the Scopus database.

## 2 MATERIALS AND METHODS

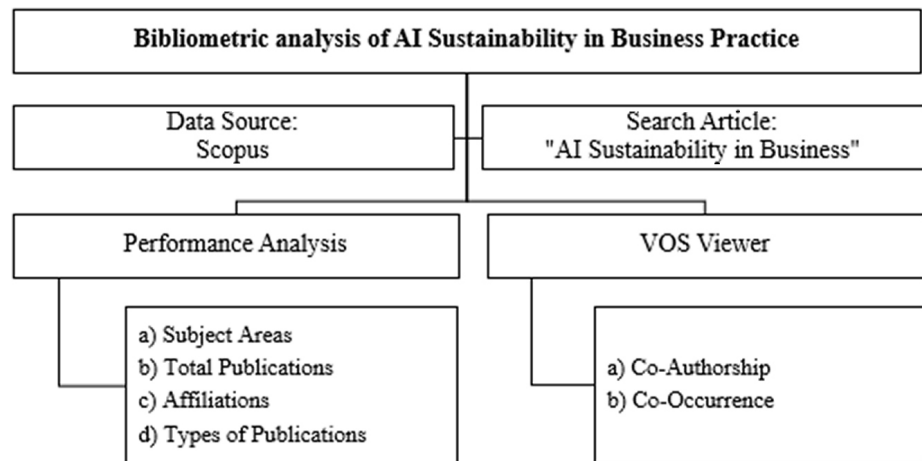


Fig. 2. Research design for bibliometric analysis

Source: Generated by authors, 2026.

Recent scholarly roadmaps emphasize the use of Scopus as the primary database for mapping the intersection of AI and supply chain sustainability due to its superior coverage of technical and managerial intersections (33). The figure above (see Figure 2) illustrates the research design of the bibliometric analysis conducted for this study, which will be discussed in detail.

## 2.1 Data selection

This study adopts the Scopus database as the primary data source for conducting a bibliometric analysis of research related to AI sustainability in business practice. Scopus has been acknowledged as having one of the most reputable multidisciplinary citation databases in the world, with a wide coverage and high citation impact [4]. Besides offering a wide range of disciplines, Scopus offers both analytical and visualization solutions that enable users to conduct systematic literature reviews. The database has been indexing more than 1.8 billion cited references since January 1970 and has included about 84 million publications by over 17.6 million researchers and published by more than 7,000 publishers across the globe [5]. Meanwhile, database selection is important because the quality of bibliometric analysis will depend on the scope and reliability of the source data [17]. Scopus can be effectively used to locate and retrieve publications that can be applied in AI sustainability in business practice due to its wide scope and reliability of data. Retrieved data were in CSV format, which was then analyzed.

## 2.2 Data collection

It was found that by searching the Scopus database with the predetermined search terms concerning AI sustainability in business, a total of 676 documents were detected in the Scopus database according to their titles, abstracts, or key terms. Such publications comprise journal articles, conference papers, book chapters, reviews, conference reviews, and a few editorials, short surveys, and notes. Its period of publication is 2008 to January 2025.

## 2.3 Performance analysis

In Scopus, preliminary descriptive statistics are offered in the form of the number of publications, institutional affiliation per year, the distribution of publication types, and the subject area of classification shown in percentages. These baseline statistics provide a general background of the research field [12].

## 2.4 Bibliometric analysis

Using VOSviewer software, researchers can investigate research trends through co-authorship analysis and co-occurrence analysis of keywords. This method follows the guidelines developed and enables researchers to verify their own method for assessing the scientific landscape in a systematic and reproducible manner [6]. Furthermore, the methodological proposals within the managerial sciences substantiate the conceptual framework used in this analysis [18]. Techniques for mapping the discipline and determining the intellectual core are used [19].

In order to have a more profound insight into intellectual organization and the research trends in the area of AI sustainability in business practice, bibliometric analysis is used as the main methodological mechanism in this study. The VOSviewer software is applied to analyze the networks of co-authorship at a country level, the pattern of co-occurring keywords in order to identify the themes of research that are dominant in the discipline, and co-citation networks to establish the most influential publications in the discipline. Scopus, combined with the use of VOSviewer to perform

the analysis of the available literature in a systematic and reproducible way, is also in line with the best practices of bibliometric studies in Scopus-indexed journals.

### 3 RESULTS

#### 3.1 Scopus database analysis

##### Numbers of studies for AI sustainability in business research.

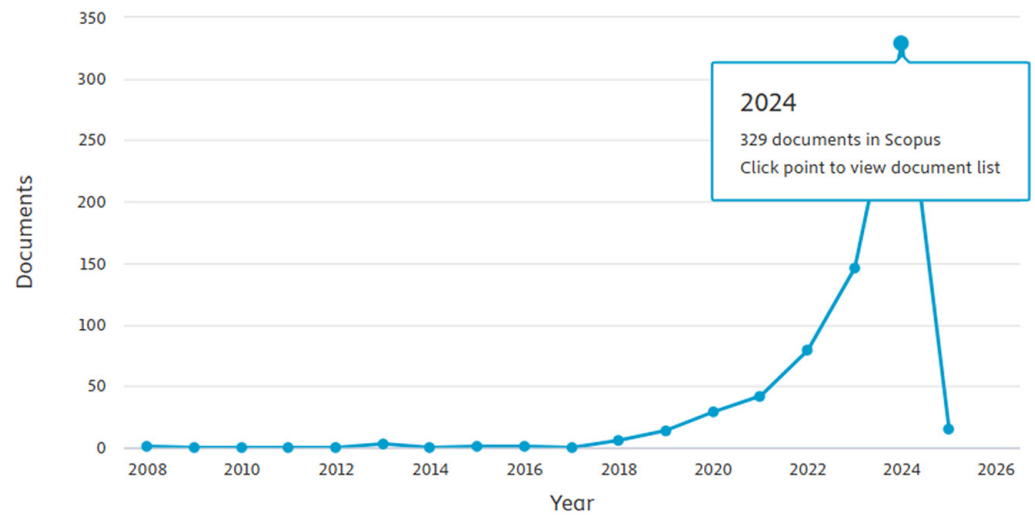


Fig. 3. Number of studies for AI sustainability in business research

Source: Generated by authors, 2026.

According to the performance analysis, 676 documents on the topic of AI sustainability in business practice were located in the Scopus database during the period between 2008 and January 2025 (see Figure 3). Even though the general volume of publications is rather small, one can observe a significant growth in providing research in recent years. In a surprising finding, a total of 329 publications has been published in 2024 to date, indicating a significant increase in researcher interest within this area of research.

##### Affiliations that published AI sustainability in business research.

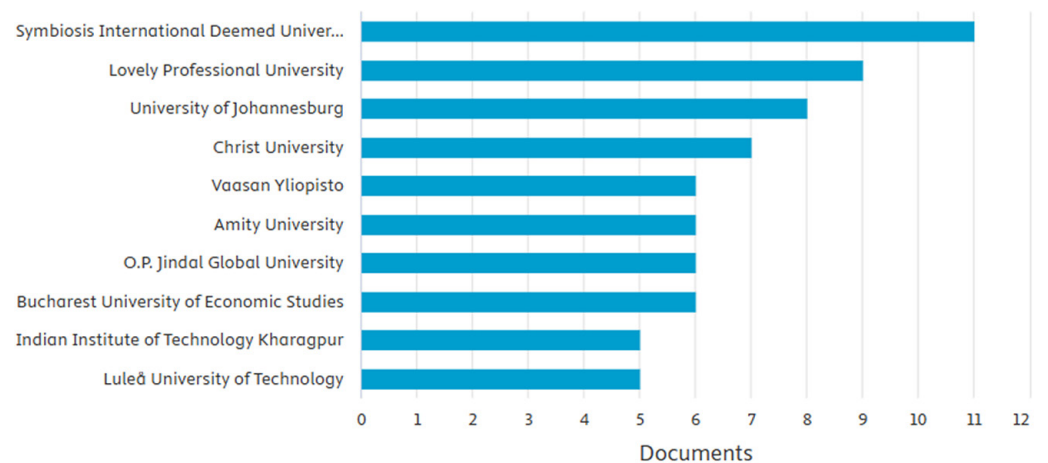
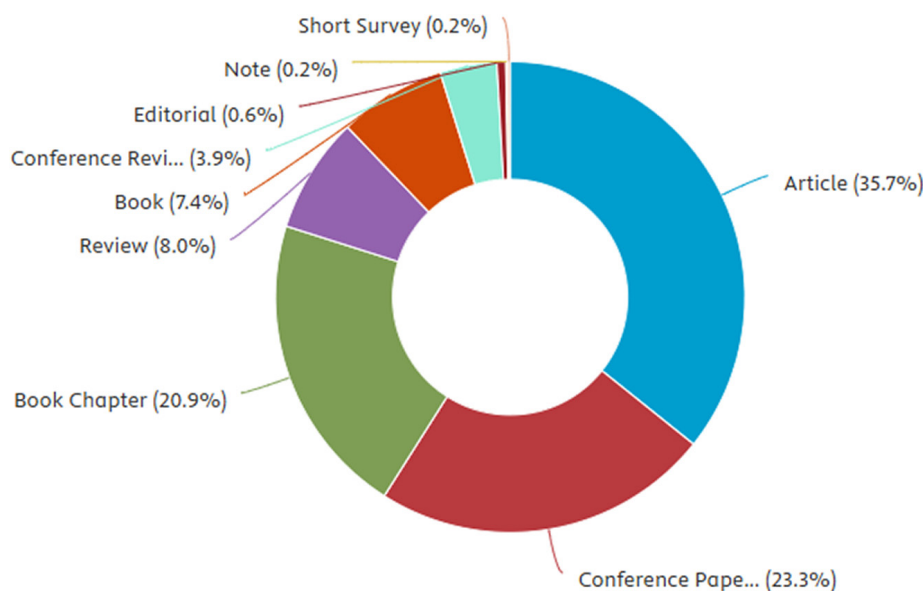


Fig. 4. Affiliation that published AI sustainability in business research

Source: Generated by authors, 2026.

The review of institutional affiliations shows the greatest number of publications to be made by Symbiosis International (Deemed University), whose 11 articles are indexed in Scopus. The next highest contributor is Lovely Professional University, which had nine publications. The remaining institutions include the University of Johannesburg and Christ University, which have published the next highest number of publications in this field with eight and seven, respectively, while all other institutions published six or fewer publications, as depicted in Figure 4. The earliest publication within this study field from Symbiosis International (Deemed University) was published in 2023 and focused on the use of augmented intelligence as an enabler for corporate social responsibility (CSR) as a means of driving sustainable economic growth, specifically within the context of decision-making, data analytics, and the automation of business processes. More recent instances of publications from this institution have reviewed how AI can enable social sustainability and ethical decision-making for micro, small, and medium enterprises (MSMEs) operating within developing countries [20]. These findings are consistent with broader trends in marketing by integrating AI for optimizing sustainable consumer interactions [39].

**Types of publication with AI sustainability in business research.**



**Fig. 5.** Types of publication with AI sustainability in business research

Source: Generated by authors, 2026.

With regard to document types, journal articles constitute the largest proportion of publications (35.7%), followed by conference papers (23.3%) and book chapters (20.9%). Reviews account for 8.0% of the total output, while books represent 7.4% and conference reviews 3.9%. The review of institutional affiliations shows that the most prolific resource in this literature is Symbiosis International (Deemed University), having 11 publications in the Scopus database (see Figure 5).

**3.2 Bibliometric analysis**

This paper uses VOSviewer to analyze the bibliography to further investigate the intellectual framework and collaborative trends in the literature. In particular,

the co-authorship analysis is performed on the country level, and the co-occurrence analysis of keywords is applied to find thematic connections between publications and the reference list of the literature.

**Co-authorship (country).**



**Fig. 6.** Bibliometric analysis on co-authorship (by country)

Source: Generated by authors, 2026.

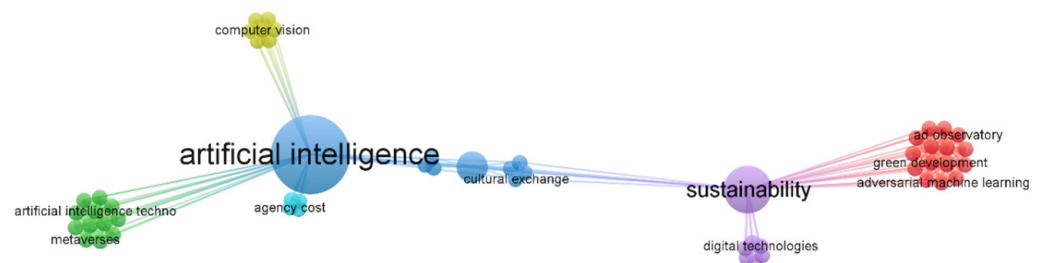
**Table 2.** Summarize the bibliometric analysis on co-authorship (by country)

ITEM	CLUSTER	TOTAL LINK STRENGTH	DOCUMENT
Russian Federation	1	4	1
China	1	4	2
Cyprus	1	4	1
Thailand	1	4	1
Italy	2	6	2
United Arab Emirates	2	1	2
United States	2	2	2

Source: Generated by authors, 2026.

The co-authorship analysis [13] focuses on the relationship between researchers and countries in the collaboration forming and is a useful tool to learn the knowledge production and scholarly influence of a specific field. This view is also substantiated by [7], who point out that networks of co-authorship indicate the trends of collaboration among authors, institutions, and countries. Network co-authorships in the given paper show that researchers in the Russian Federation, China, Cyprus, Thailand, Italy, the United Arab Emirates, and the United States are interconnected in their work (see Figure 6) (refer to Table 2). Among those countries, Italy turns out to have the greatest overall strength as a link, which means that it is at the center of international research cooperation in the sphere of AI sustainability in business practice.

**Co-occurrence (all keywords).**



**Fig. 7.** Bibliometric analysis on co-occurrence (by keywords)

Source: Generated by authors, 2026.

**Table 3.** Summary of the bibliometric analysis on co-occurrence (all keywords)

ITEM	CLUSTER	LINK	TOTAL LINK STRENGTH	OCCURRENCE
Artificial Intelligence (AI)	3	32	33	5
Sustainability	5	27	27	3
Digital Transformation	3	9	10	2
Digital Technologies	5	6	6	1
Ad Observatory	1	15	15	1
Adversarial Machine Learning	1	15	15	1
AI Technologies	2	12	12	1
Computer Vision	4	7	7	1
Agency Cost	6	4	4	1
Cultural Exchange	3	6	6	1
Green Development	1	15	15	1
Sustainable Development	1	15	15	1

Source: Generated by authors, 2026.

Conversely, the co-occurrence of keywords analysis is concerned with defining conceptual associations among the terms that are commonly used in a research field. In the definition of co-occurrence [8], it is said to be the co-presence of keywords in the publications discussing AI sustainability in business practice, where semantically related words are clumped together into specific clusters. In the dataset under analysis, 84 keywords were discovered, out of which 54 of them were highly interconnected and divided into six thematic clusters (see Figure 7). The most popular keywords included AI which had the most number of total link strength (33) with five instances and sustainability with a total link strength of 27 with three instances [9]. Such other prominent terms as ad observatory, adversarial machine learning, green development, and sustainable development have the overall link strength of 15 with a single occurrence [10]. Also, the total link strength of AI technologies was 12 with one occurrence, and that of computer vision was 7 with one occurrence (refer to Table 3). Other new words such as green development and circular economy, also suggest the shift to innovative business practices with an emphasis on resource efficiency [24]. Also, computer vision & machine learning illustrate that the technological boundary of environmental monitoring has been significantly expanded [23].

## 4 DISCUSSIONS

This study is providing an alternative way to conduct a literature review of AI's sustainability in practices in businesses using bibliometric sentiment analysis of publications found in the Scopus database. Instead of using a standard narrative literature review or systematic literature review, this method allows for a more structured data-driven assessment of the current body of research [26]. By being able to utilize the full breadth of Scopus' coverage, this method allows for the systematic and efficient identification of both global research trends and thematic pattern identification, thus helping to address the difficulties associated with manually searching and reviewing.

Additionally, this study also provides a valuable resource by providing an analytical review of the literature contained in the internationally recognized Scopus database. Future research should address the gaps in agricultural sciences and mathematics, where AI application remains underrepresented [22]. Additionally, as generative AI models like ChatGPT evolve, their impact on sustainability reporting and transparency must be critically evaluated [25].

The bibliometric results from this review help in the identification of potential future research areas and the identification of the existing gaps in literature. For example, the results show that the main contributors to the research on AI sustainability in business practices are from Italy, China, Cyprus, the Russian Federation, Thailand, the United Arab Emirates, and the USA. This suggests that working together with researchers from these countries may provide richer scholarly contributions to the body of knowledge on AI and sustainability in business. Following a keyword analysis conducted on all 676 publications found with terms such as AI, sustainability, and digital transformation, several interesting themes emerge, warranting additional research.

The research objectives for this study include those outlined below:

1. There are 676 studies related to AI sustainability in business published from 2008 through January 2020 and in the Scopus database.
2. The primary countries contributing to publications on AI sustainability in business include Italy, China, Cyprus, Russia Federation, Thailand, the United Arab Emirates, and the United States.
3. The most utilized keywords within this area of research include AI, sustainability, and digital transformation.

## 5 LIMITATIONS AND FURTHER STUDY

As the incorporation of AI in financial practices continues to intensify, striking a balance between the advancement of technology and ethical responsibility is crucial to ensuring the sustainability of ESG factors [21]. As revealed in the World Economic Forum's report for 2025, AI has transformed from a technology aimed at increasing efficiency to being the foundational infrastructure for the development of next-generation, real-time sustainability reporting. However, it is important to implement these technologies based on a framework that promotes transparency and corporate responsibility to address issues of algorithmic bias [35].

This review of the literature presents several limitations that should be noted. One limitation we should note is that this review was completed utilizing data only from Scopus. Scopus is one of the authoritative databases in terms of coverage and reliability; however, researchers could consider additional reputable databases (Web of Science, PubMed, etc.) to conduct future analyses that include these other sources of data to allow researchers to compare different databases to provide a broader view of the overall research landscape. There are also limitations related to the exclusive focus of this study on AI sustainability from a business practice perspective. Future studies should explore such issues in other fields, like education, the government, and the public sector, which may provide unique insights.

Another limitation of this study is that VOSviewer is the primary analytical software used for performing bibliometric analyses. Although the use of VOSviewer is established as an appropriate software program for creating visual representations of bibliometric networks, researchers could re-analyze the data set from this

study using alternative analytical software (e.g., *BibExcel*, *Bibliometrix*, *Altmetrics*, and *SciMAT*) to confirm or verify the results from this study and identify additional patterns through different analytical methods.

In addition, further studies should examine how using AI in agricultural sciences and mathematics is being underutilized. As generative AI systems like ChatGPT grow in capabilities, it will be important to evaluate their effects on sustainability reporting and transparency [31]. According to research, optimizing with the help of AI logistics and supply chain operations can reduce CO2 emissions [27]. AI should also assist in developing smart cities into sustainable, resilient cities [28]. Finally, inclusive progress requires developing frameworks to reduce algorithmic bias and foster inclusive AI [32].

This study should lead to greater interest among scholars globally in conducting research on the sustainability of AI using various research methods. As AI and sustainability are two of the main drivers of the current evolution taking place within research, studying these two topics using qualitative, quantitative, or mixed-method approaches will provide researchers with a more complete understanding of both issues because using multiple approaches will allow for multiple perspectives to be captured [40]. While this paper provides a general overview of AI and sustainability through bibliometrics, future researchers may wish to narrow their focus and concentrate on a specific industry or sector, which will enable them to generate richer contextual information than what is so far available through the broad approach currently provided here. Research conducted strategically has shown that AI has an enormous impact on increasing sustainability performance through the support of green intellectual capital and commitment to green innovations as a mediatory agent [36]. While AI is providing this opportunity for organizations, they are still facing many ethical and practical challenges during the adoption phase [37]. As a result, organizations have to find solutions to resolve their technological advances while perfecting their management techniques to be responsible.

In conclusion, this study provides meaningful results, in that it offers evidence for the value of bibliometric analysis as a complementary methodology (to traditional systematic reviews) by providing an insightfully quantitative view of the current state of the art in AI and sustainability research [34]. In order to enhance researchers' competencies in systematically reviewing literature, higher education institutions should be encouraged to include bibliometric methods as part of their curriculum for research methods. This will help produce researchers who possess the analytical skill set necessary to conduct a more thorough and insightful review of the literature on these two topics [39]. Finally, this study identifies some research areas and emerging themes in AI research that could be used to enhance the study of bibliometric literature and increase the number of keyword-based studies across disciplines.

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**Conflicts of Interest:** The authors declare no conflict of interest.

**Ethical Approval:** Formal ethical approval has been waived since this study adhered to the principles of the Declaration of Helsinki, following strict ethical standards. Participation was anonymous, confidential, and voluntary, with informed consent obtained from all participants. There were no biomarkers or tissue samples collected for analysis. Participants had the freedom to withdraw from the study at any point.

**Data availability statement:** Scopus Database used. There is no data in hand.

**Contribution:** The authors equally contributed to the present research at all stages, from the formulation of the problem to the final findings and solution.

**Declaration of generative AI and AI-assisted technologies in the manuscript preparation process:** During the preparation of this work the author(s) used [ChatGBT—AI Chatbot] in order to check grammar, spelling, and references. After using this tool/service, the author(s) reviewed and edited the content as needed and take(s) full responsibility for the content of the published article.

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