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CHARTING THE COURSE OF AI IN BUSINESS SUSTAINABILITY: A BIBLIOMETRIC ANALYSIS

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Abstract:

Artificial intelligence (AI) sparked the attention of both researchers and the business community worldwide and has become a buzzword. Similarly, (business) sustainability emerged as a prominent and pivotal concept. Given the rapid evolution of the technological advancement in AI and its potential impact(s), this paper aims to identify the ways in which AI crosses paths with business sustainability, to provide an overview of the topic and to uncover research trends using a bibliometric approach. In order to reach the research goal of the paper, we investigated the academic literature published and indexed in Scopus database using computer assisted quantitative techniques on bibliometric data and with the help of VOSviewer we visually emphasized the interconnections between fields and results. Ultimately, the present paper intends to contribute to a deeper understanding of the symbiotic relationship between AI and business sustainability, by providing insights that are purposed to enhance the academic discourse in a rapidly evolving domain.

Keywords: *Artificial Intelligence (AI), Business Sustainability, Bibliometric Analysis*

1. Introduction

Artificial Intelligence (AI) holds significance for societies, businesses, employment, and education, and that it is increasingly becoming deeply integrated into everyday life. AI is reshaping our world (Niemi et al., 2023).

It's important to note that within organizations, sustainability entails the development of strategies and plans aimed at efficiently mitigating the environmental consequences arising from their operational activities and businesses must recognize that achieving sustainability calls for more than addressing environmental concerns; they also must safeguard the long-term wellbeing of society (Vrontis et al., 2023).

Given this - the importance of AI and Business sustainability -, we undertook a bibliometric analysis to explore the interconnection(s) between these two topics and present an overview of the current status research in this field. The analysis included over 600 documents and demonstrated the interdisciplinarity of the topic with concepts that are interwoven into the activities of everyday life.

2. Conceptual Background

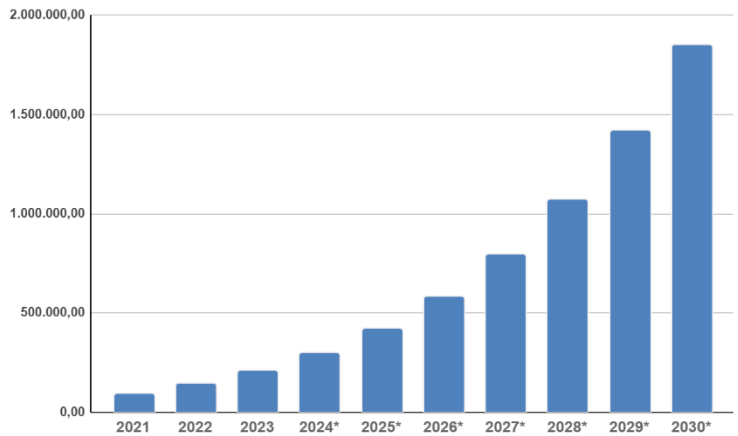
In setting the stage for our subsequent bibliometric analysis, we provide a concise overview of AI and its (growing) role in the realm of business sustainability. Thus, we delve into AI's rapid ascension as a pivotal tool in the business world that has signaled a paradigm shift into how organizations act in relation to sustainability.

2.1 Brief overview of AI and Business Sustainability

Artificial intelligence (AI) together with Machine Learning (ML), Deep learning algorithms and other technologies associated with AI spurred the interest of researchers while its application in the day-to-day life devices attracted more users. An Authority Hacker study (n=3,812) shows that 77% of currently used devices feature some kind of AI (Webster, 2023b) (Webster, 2023a). Also, according to Search Logistics (2021) there were more than 4.2 billion devices with AI empowered assistants and this number is expected to double by 2024 (Woodward, 2022). The same study shows that one third of businesses used some kind of AI in 2021.

The market for AI is predicted to grow and reach almost two trillion (1.847 billion) USD by 2030 (Next Move Strategy Consulting, 2023) (Statista, 2023) as per Figure 1.

Figure 1. AI Market size with a forecast (*) until 2030 (in million U.S. dollars)



Source: Next Move Strategy Consulting / Statista (2023)

For the purpose of this article we used the AI definition created by High-Level Expert Group on Artificial Intelligence of the European Commission (AI HLEG) (EC) which states the following: "Systems that display intelligent behavior by analyzing their environment and taking actions – with some degree of autonomy – to achieve specific goals (High-Level Expert Group on Artificial Intelligence, 2018) (*Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions on Artificial Intelligence for Europe*, 2018). But this is just one way to define AI, as there are a lot more definitions ranging from weak/narrow AI to the more complex, strong AI, and even to artificial general intelligence (AGI). Therefore, it is difficult to have a unanimous definition due to the evolution of this discipline (Sheikh et al., 2023).

Sustainability is a popular term (Sambhanthan, 2022) and since 1992 over 170 countries have agreed to work towards building and implementing a sustainable development plan to improve human lives and take care of the environment (United Nations, 1992) and sustainability management has become widespread among (especially larger) firms (Dyllick & Muff, 2016). The interpretation of sustainability differs for each stakeholder, influenced by their varying emphasis on the three components: economic, environmental and social but the main goal is to optimize the resources according to human needs while considering the 3 above-mentioned components (Karakutuk et al., 2021).

Sustainability stands as a fundamental element of contemporary businesses in the 21st century (Hallioui et al., 2022). Businesses are growing more cognizant of the escalating environmental, economic, and social challenges prevalent in the world they operate in. Consequently, there is a prevailing trend among most companies to realign their operations and services in accordance with a sustainability agenda (Petruse et al., 2016).

2.2 How AI interferes with (Business) Sustainability

The European Commission (EC) acknowledges the importance of AI and its potential impact on sustainable development in the White Paper on Artificial Intelligence announcing that utilizing AI systems can play a pivotal role in the realization of the Sustainable Development Goals (SDGs), and in supporting the democratic process and safeguarding social rights (European Commission, Directorate-General for Communications Networks, Content and Technology, 2020).

According to several research studies, including articles featured in Nature Communications, AI has the potential to contribute to the attainment of approximately 79% of the SDGs. The studies show that AI is acting as an enabler on the SDGs (134 targets), so having a positive impact, but it can also have a negative impact, acting as an inhibitor on some SDGs (59 targets) (Vinuesa et al., 2020).

AI is exerting its influence on diverse aspects of various sectors in the realm of sustainable development. For instance, it is making an impact on the global energy industry, environmental results, productivity, and other societal factors. AI and sustainability have commonly been categorized into four primary domains: Human, Social, Economic, and Environmental (Kar et al., 2022).

Studies like the one done by Pan and Nishant (Pan & Nishant, 2023), who analyzed in detail over 40 articles related to AI and sustainability, showed that AI has an influence on domains like: Marketing, Supply Chain (Circular economy), Human Resources Management, Finance, Technology and Innovation. Other papers focus on how AI can improve the water crisis, agriculture and health (Goralski & Tan, 2020). Some discuss the increasing use of AI in education, teaching and learning which comes with opportunities but also challenges, especially when it comes to ethics (Kousa & Niemi, 2023).

Several potential effects of AI on business sustainability are highlighted in the literature:

- Improve energy efficiency, reduce carbon emissions (Vrontis et al., 2023)
- Increase the reliability of the recycling process and better waste management (Nañez Alonso et al., 2021)
- Enhance performance and communication as a positive impact on the circular economy (Upadhyay et al., 2021)
- Healthcare, by enhancing the use of robotic systems (Pee et al., 2019).

Just to mention a few of them, these are among the most looked upon in the literature so far.

AI has the potential to transform business practices and to address societal issues like sustainability. While progress is being made towards sustainable development, numerous challenges and concerns remain in relation to the forthcoming integration of AI into the business sustainability framework.

We would like to conclude this chapter by mentioning that we subscribe with the following idea: “The true value of AI will not be in how it enables society to reduce its energy, water, and land use intensities, but rather, at a higher level, how it facilitates and fosters environmental governance” (Nishant et al., 2020).

3. Data and Methodology

For the present paper, we conducted a bibliometric analysis using VOSviewer, version 1.6.19 (van Eck & Waltman, 2018) - a widespread instrument for systematic review in the field of business and economics (Mihu et al., 2021) (Ogrean & Herciu, 2021) (Rialti et al., 2019) (Țîmbalari & Herciu, 2023) - in order to obtain network-based maps by analyzing bibliometric data. Systematic literature review is used to analyze a wide range of data available as a way to reach clearly stated, reproducible, quantifiable and extensive coverage of a given topic (Weed, 2006).

Figure 2. Bibliometric protocol of the study



Source: Own elaboration

The first step of the research involved identifying the significant corpus of documents in relation to the topic of interest and for this, we proceeded with selecting the database. Even though the triad of major bibliometric databases refers to Scopus, Web of Science (WoS) and Google Scholar (Harzing & Alakangas, 2016), for the conducted research Scopus database was chosen as it entails one of the largest collection of articles in the study field (José De Oliveira et al., 2019). Moreover, it was preferred due to its wide coverage - covering more than 90 million records, 17 million author profiles and 7.000 publishers (McCullough, 2023) - as well as because of its high level of quality regarding scholarly information (Kumar et al., 2023).

To perform the research, we ran a query within the database, respectively within *Article title, Abstract and Keywords*. Boolean logic (AND/OR) was used to extract the literature corpus related to the reference strings of interest, namely “AI” and “business sustainability”. Because we attempted to obtain a robust (as possible) representation of the phenomenon, we included some of the most relevant derivatives (expressed through the “*” symbol in the query) as well as prevalent synonyms. Thereby, the search consisted in the following (advanced) query:

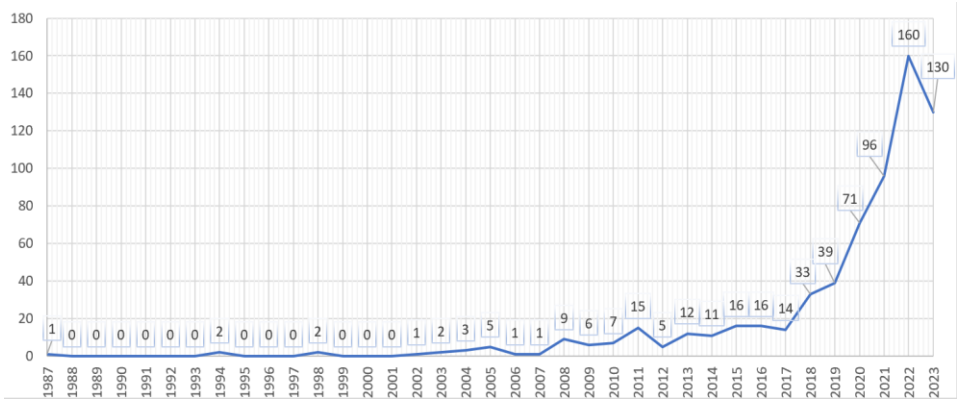
TITLE-ABS-KEY ("artificial intelligence" OR "AI" OR "artificial general intelligence" OR "AGI" OR "learning machine" OR "deep learning") AND TITLE-ABS-KEY ("business sustainability" OR "sustainable business*" OR "sustainable compan*" OR "responsible

business" OR "responsible compan*" OR "sustainable management" OR "sustainable business model*" OR "SBM" OR "corporate sustainability" OR "ESG" OR "firm sustainab*" OR "sustainability reporting" OR "green business*" OR "corporate social responsibility") AND (LIMIT-TO (DOCTYPE , "ar") OR LIMIT-TO (DOCTYPE , "cp") OR LIMIT-TO (DOCTYPE , "ch") OR LIMIT-TO (DOCTYPE , "re") OR LIMIT-TO (DOCTYPE , "bk") OR LIMIT-TO (DOCTYPE , "ed")) AND (LIMIT-TO (LANGUAGE , "English"))

We refined the search by applying two filters: (1) Language - looking to obtain results in the English language considering that publishing in English is currently the best way to share research findings around the world (nonetheless, the English documents accounted for 98,65% out of the total documents returned) and (2) Document type - limiting results to Articles, Conference papers, Book chapters, Reviews, Book and Editorials; In contrast, Conference Reviews, Retracted documents, Erratums and Notes were excluded as they were considered to be less relevant considering the research objective. The timespan ranged from 1987 (the publication year of the first paper related to the subject in the searched database) up until September 2023.

The query yielded a total of 658 documents and next we continued with a primary analysis of the search results, according to Scopus's "analyze search results" tool. Given the novelty character of the considered topic, it does not come as a surprise that researchers' interest was sparked over the last (recent) years (Figure 3). In fact, roughly 70% (out of the entire distribution) accounts for the documents that have been published from 2020 until September 2023.

Figure 3. Documents distribution by year (1987-September 2023)



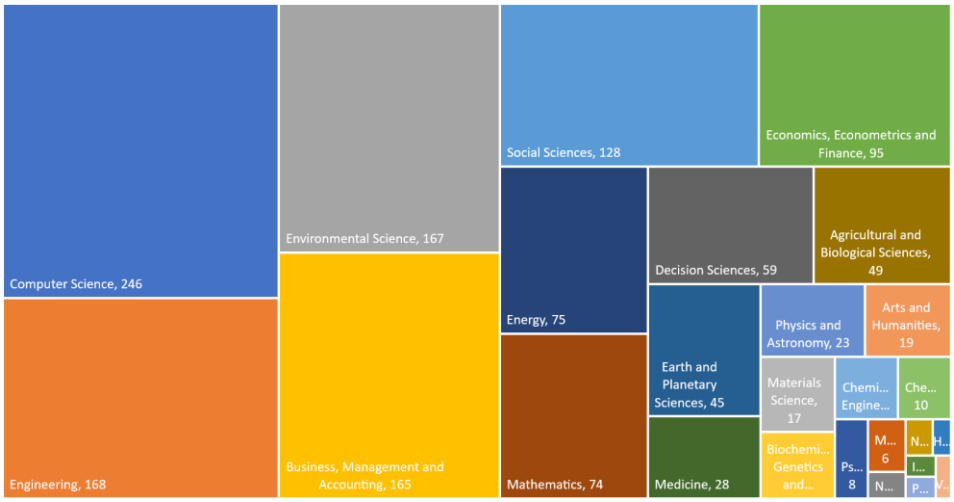
Source: Scopus

One possible explanation can be attributed to the rapid development of technology (together with its use and application in practice) and its adoption by companies. To this adds the desire (but also the need) of businesses to be more (and more) aligned with sustainability principles and develop sustainable business models for the sake of (sustainable) competitive advantage and not only.

Most of the identified documents (53.5%) are represented by articles, followed by conference papers (28.3%) and book chapters (9.9%).

Bridging AI and business sustainability has gained popularity among academia in general, gathering under the phenomenon's umbrella 26 subject areas (Figure 4).

Figure 4. Subject areas of the analyzed phenomenon



Source: Scopus

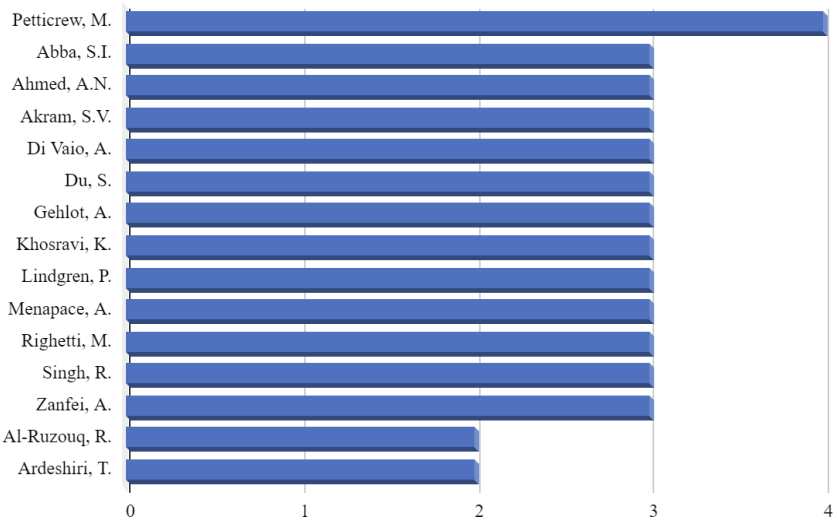
This clearly points out the interdisciplinarity of the topic, which proved of interest particularly in research areas such as: (1) Computer Science (246 documents; 17.3%), (2) Engineering (168 documents; 11.8%), (3) Environmental Science (167 documents; 11.7%), (4) Business, Management and Accounting (165 documents; 11.6%), (5) Social Sciences (128 documents; 9%) and (6) Economics, Econometrics and Finance (95 documents; 6.7%). Hence, the top 6 aforementioned areas cover roughly 68% of the analyzed documents.

Regarding the authors that contributed to the published documents (found in Scopus database) that integrate AI and business sustainability, Figure 5 lists the top 15 authors. Mark Petticrew from London School of Hygiene & Tropical Medicine sits on top of the list, contributing with 4 documents to the topic, while the next 12 authors have contributed each with 3 documents.

Moreover, the results obtained - from the primary analysis - reflected that the top three journals which published documents on the analyzed topic are: (1) Sustainability Switzerland (37 documents), (2) Remote Sensing (10 documents) and (3) Journal of Cleaner Production (8 documents). Among the top sources there are also the Book Series of (1) Lecture Notes in Computer Science (12 documents) and (2) CSR, Sustainability, Ethics and Governance (8 documents) - both published by Springer Nature.

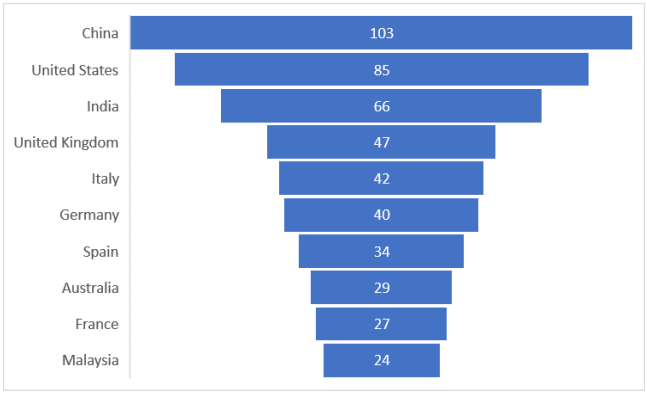
In making sense of the countries and territories where interest on the analyzed topic was sparked, we observed (Figure 6) that China leads the documents count (with 103 documents) along with the United States (85 documents) and India (66 documents).

Figure 5. Top (15) authors contributing to the analyzed phenomenon



Source: Scopus

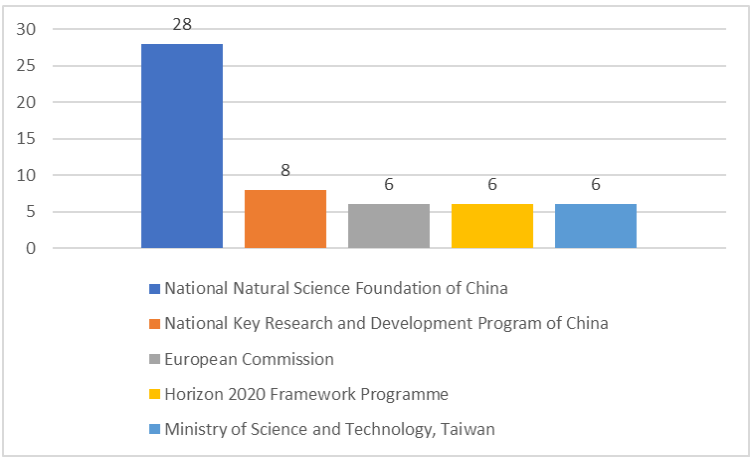
Figure 6. Top (10) countries/territories



Source: Scopus

Attributing the (documents) count lead to China is corroborated by the fact that National Natural Science Foundation of China (28 documents) together with National Key Research and Development Program of China (8 documents) are the top two funding sponsors (Figure 7) according to the primary analysis of the search results.

Figure 7. Top (5) funding sponsors



Source: Scopus

The data obtained from Scopus was exported in CSV format and subsequently imported into VOSviewer software to identify research clusters and generate network-based maps. Throughout the process, we performed a data "cleansing" by merging different forms of the same keyword (such in the case of singulars and plurals, variations in British and American spelling etc.) via a Thesaurus file.

Regarding the types of analysis that were ran, we created maps based on bibliographic data to:

1) perform keywords co-occurrence analysis (using all keywords, the full counting method, and a threshold of 5 as a minimum number of occurrences of a keyword, where 227 keywords met the threshold);
2) perform (documents) citation analysis: a) for all documents and b) for those documents that had at least 50 citations.

4. Analysis and Findings

Keywords co-occurrence analysis

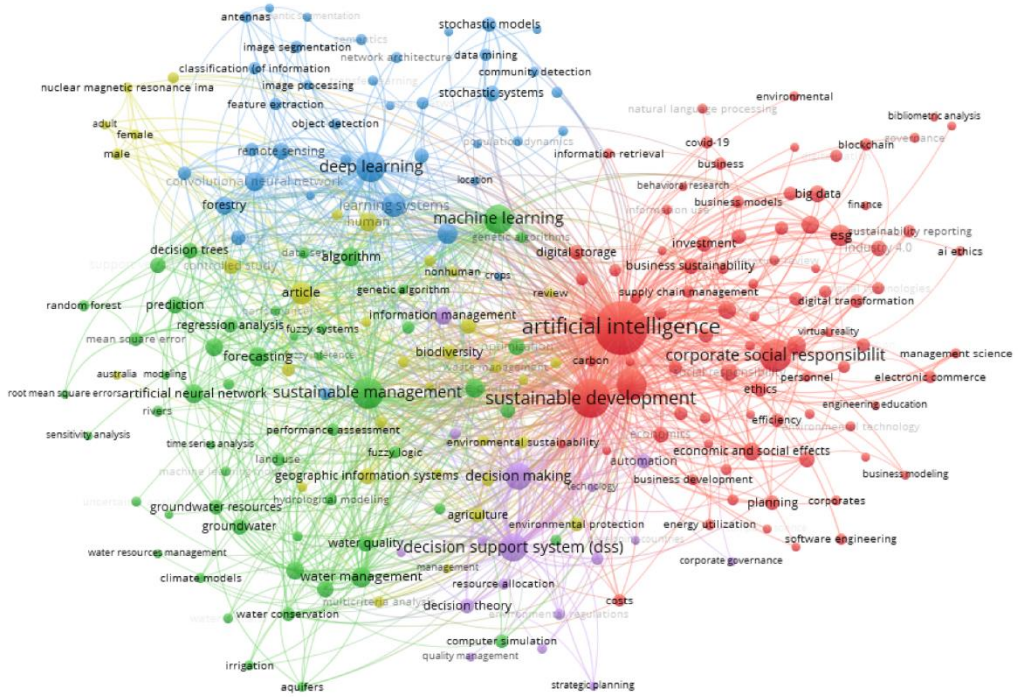
After running the keyword co-occurrence analysis, five distinct clusters of research within the context of business sustainability and artificial intelligence emerged, each encompassing varying themes and focuses (Figure 8).

Cluster 1 (red) is the largest and the keywords suggest a strong emphasis on how artificial intelligence can intersect with sustainable development, with particular attention to corporate social responsibility and the broader economic and social effects (Table 1). The high total link strength of 'artificial intelligence' indicates it's a central topic in the literature.

The green cluster's (2) keywords like 'sustainable management' and 'machine learning' suggest a focus on the application of AI in resource management, specifically water. This indicates a trend in research that looks at how machine learning can be used for

the management and forecasting of water resources, which is a critical aspect of environmental sustainability.

Figure 8. Keywords co-occurrence map



Source: Own processing via VOSviewer

In the blue cluster (3), there's an apparent emphasis on more technical aspects of AI such as deep learning and its applications in learning systems and convolutional neural networks. The presence of 'ecosystems' and 'forestry' implies a focus on using advanced AI techniques for environmental monitoring and management in natural settings.

This fourth cluster (yellow) appears to be diverse, with 'human' and 'agriculture' suggesting research on the human aspect of AI and its applications in agriculture. It also includes 'environmental management' and 'geographic information systems', indicating a focus on using AI for managing environmental data and possibly for spatial analysis in agriculture and environmental sciences.

The smallest cluster (5-purple) focuses on decision-making processes, with a strong link to 'decision support systems' and 'decision making'. It also ties into 'information management', namely into how AI aids in making informed decisions in a business context, particularly through automation and decision theory.

Table 1. Author keywords co-occurrence clusters

Cluster	Author (top 5) keywords with the most powerful total link strength
Cluster 1 – Red (87 items)	artificial intelligence (1777 total link strength); sustainable development (1187); sustainability (503); corporate social responsibility (375); economic and social effects (174)
Cluster 2 - Green (52 items)	sustainable management (709); machine learning (471); water management (367); water resource (251); forecasting (246)
Cluster 3 - Blue (38 items)	deep learning (533); learning systems (296); ecosystems (282); convolutional neural network (249); forestry (200)
Cluster 4 - Yellow (33 items)	article (322); human (213); agriculture (166); environmental management (173); geographic information systems (172)
Cluster 5 - Purple (17 items)	decision support systems - dss (601); decision making (559); information management (224); decision theory (123); automation (97)

Source: Processing via VOSviewer

Therefore, the analysis brings forward the following:

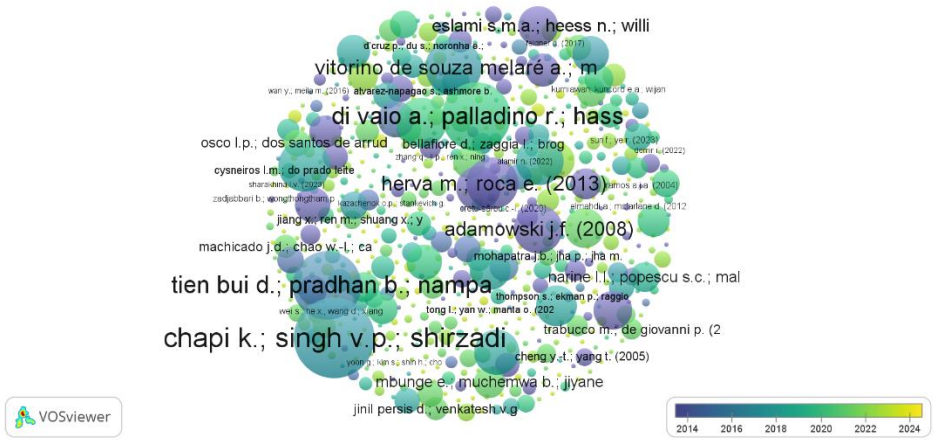
- The dominance of AI in discussions around sustainable development and the potential for AI to drive it forward;
- It shows how machine learning is specifically being applied to critical sustainability issues like water management;
- It illustrates technical advancements in AI (e.g. deep learning, convolutional neural networks) and how they are being tailored to applications in ecology and forestry;
- It emphasizes the interdisciplinary nature of AI applications in sustainability (particularly how human factors and geographic information systems are being integrated into environmental management and agriculture);
- The role of decision support systems in sustainability, looking at how information management and decision theory are evolving with the advent of AI and automation.

Citation analysis

We have also run a citation analysis using as the unit of analysis the number of documents in order to emphasize the most important articles based on the number of citations. The analysis revealed that of all analyzed documents, 444 had more than 1 citation

(Figure 9). One possible reason for the lack of citations or the small number of citations might be because a lot of papers were published recently, in the last 1-2 years.

Figure 9. Citation map of all analyzed documents



Source: Processing via VOSviewer

Due to the high number of articles, we would like to spotlight the top documents, respectively the ones with the most citations. In order to simplify the visualization for the next analysis we selected only papers with at least 50 citations to show up (Figure 10).

Figure 10. Citation map of top cited documents



Source: Processing via VOSviewer

The most cited work belongs to Kamran Chapi, Vijay P. Singh, Ataollah Shirzadi, Himan Shahabi, Dieu Tien Bui, Binh Thai Pham, Khabat Khosravi and the title is "*A novel hybrid artificial intelligence approach for flood susceptibility assessment*" with 355 citations. Their article proposes an AI model for flood mapping that can be used for sustainable management of flood-prone areas.

The second most cited article (253 citations) belongs to Assunta Di Vaio, Rosa Palladino, Rohail Hassan, Octavio Escobar with the title "*Artificial intelligence and business models in the sustainable development goals perspective: A systematic literature review*" published in the Journal of Business Research. As the title suggests, it is a literature review which tackles the research question: What is the role of AI in the development of sustainable business models from the perspective of the sustainable development goal number 12, securing sustainable consumption and production patterns.

The third most cited paper (253 citations) was written by Dieu Tien Bui, Biswajeet Pradhan, Haleh Nampak, Quang-Thanh Bui, Quynh-An Tran, Quoc-Phi Nguyen titled "*Hybrid artificial intelligence approach based on neural fuzzy inference model and metaheuristic optimization for flood susceptibility modeling in a high-frequency tropical cyclone area using GIS*", which uses AI applications and GIS techniques for flood management.

The fourth article when it comes to citations (171 citations) is another review "*Technologies and decision support systems to aid solid-waste management: a systematic review*" prepared by Angelina Vitorino de Souza Melaré, Sahudy Montenegro González, Katti Faceli, Vitor Casadei. The authors state that business intelligence tools and techniques could be a new way to improve decision-making concerning waste management.

The fifth article, citation wise (151 citations), is the work of Marta Herva and Enrique Roca and it is called "*Review of combined approaches and multi-criteria analysis for corporate environmental evaluation*". The main key words are Corporate sustainability and Ecological Footprint.

Out of 5 papers, 4 focus directly or indirectly on the environmental pillar of the business sustainability, so a more in-depth systematic literature review is needed in order to discover articles with focus on the other two pillars (economic and social) or to identify and conclude if this could be considered a research gap.

5. Conclusions

All in all, the present paper has cast light on the intricate relationship (and multifaceted interconnections) between artificial intelligence and business sustainability, highlighting AI's expansive role in reshaping various sectors such as energy, resource management, and corporate governance towards sustainable practices. The synergistic potential of AI in streamlining efficiency and (re)enforcing sustainability's core principles promises a future where technological innovation and environmental responsibility converge, fostering a robust corporate environment. As this discourse continues to mature, our study lays the groundwork for future research, emphasizing the importance of integrating AI into business models in a way that is compatible with the holistic goals of sustainability, marking a new era where AI-driven decision-making and operational processes are synonymous with transformative and sustainable business journeys.

6. References

Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions on Artificial Intelligence for Europe. (2018). European Commission. https://ec.europa.eu/transparency/documents-register/api/files/COM(2018)237_0/de00000000142394?rendition=false

Dyllick, T., & Muff, K. (2016). Clarifying the Meaning of Sustainable Business: Introducing a Typology From Business-as-Usual to True Business Sustainability. Organization & Environment, 29(2), 156–174. https://doi.org/10.1177/1086026615575176

European Commission, Directorate-General for Communications Networks, Content and Technology. (2020). COM(2020) 65 final. https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:52020DC0065

Goralski, M. A., & Tan, T. K. (2020). Artificial intelligence and sustainable development. The International Journal of Management Education, 18(1), 100330. https://doi.org/10.1016/j.ijme.2019.100330

Hallioui, A., Herrou, B., Santos, R. S., Katina, P. F., & Egbue, O. (2022). Systems-based approach to contemporary business management: An enabler of business sustainability in a context of industry 4.0, circular economy, competitiveness and diverse stakeholders. Journal of Cleaner Production, 373, 133819. https://doi.org/10.1016/j.jclepro.2022.133819

Harzing, A.-W., & Alakangas, S. (2016). Google Scholar, Scopus and the Web of Science: A longitudinal and cross-disciplinary comparison. Scientometrics, 106(2), 787–804. https://doi.org/10.1007/s11192-015-1798-9

High-Level Expert Group on Artificial Intelligence. (2018). A definition of AI.

José De Oliveira, O., Francisco Da Silva, F., Juliani, F., César Ferreira Motta Barbosa, L., & Vieira Nunhes, T. (2019). Bibliometric Method for Mapping the State-of-the-Art and Identifying Research Gaps and Trends in Literature: An Essential Instrument to Support the Development of Scientific Projects. In S. Kunosic & E. Zerem (Eds.), Scientometrics Recent Advances. IntechOpen. https://doi.org/10.5772/intechopen.85856

Kar, A. K., Choudhary, S. K., & Singh, V. K. (2022). How can artificial intelligence impact sustainability: A systematic literature review. Journal of Cleaner Production, 376, 134120. https://doi.org/10.1016/j.jclepro.2022.134120

Karakutuk, S. S., Akpinar, S., & Ornek, M. A. (2021). An application of a circular economy approach to design an energy-efficient heat recovery system. Journal of Cleaner Production, 320. Scopus. https://doi.org/10.1016/j.jclepro.2021.128851

Kousa, P., & Niemi, H. (2023). Artificial Intelligence Ethics from the Perspective of Educational Technology Companies and Schools. In H. Niemi, R. D. Pea, & Y. Lu (Eds.), AI in Learning: Designing the Future (pp. 283–296). Springer International Publishing. https://doi.org/10.1007/978-3-031-09687-7_17

Kumar, P., Hollebeek, L. D., Kar, A. K., & Kukk, J. (2023). Charting the intellectual structure of customer experience research. Marketing Intelligence & Planning, 41(1), 31–47. https://doi.org/10.1108/MIP-05-2022-0185

McCullough, R. (2023). The Scopus Content Coverage Guide: A complete overview of the content coverage in Scopus and corresponding policies | Elsevier Scopus Blog. https://blog.scopus.com/posts/the-scopus-content-coverage-guide-a-complete-overview-of-the-content-coverage-in-scopus-and

Mihu, C., Bogoslov, I. A., & Lungu, A. E. (2021). The Impact of Digital Transformation on Business Management. Revista Economica, 73(4).

Nañez Alonso, S. L., Reier Forradellas, R. F., Pi Morell, O., & Jorge-Vazquez, J. (2021). Digitalization, Circular Economy and Environmental Sustainability: The Application of Artificial Intelligence in the Efficient Self-Management of Waste. Sustainability, 13(4), 2092. https://doi.org/10.3390/su13042092

Next Move Strategy Consulting. (2023). Artificial Intelligence Market Size and Share | Analysis—2030. https://www.nextmsc.com/report/artificial-intelligence-market

Niemi, H., Pea, R. D., & Lu, Y. (2023). Introduction to AI in Learning: Designing the Future. In H. Niemi, R. D. Pea, & Y. Lu (Eds.), AI in Learning: Designing the Future (pp. 1–15). Springer International Publishing. https://doi.org/10.1007/978-3-031-09687-7_1

Nishant, R., Kennedy, M., & Corbett, J. (2020). Artificial intelligence for sustainability: Challenges, opportunities, and a research agenda. International Journal of Information Management, 53, 102104. https://doi.org/10.1016/j.ijinfomgt.2020.102104

Ogrean, C., & Herciu, M. (2021). Digital Transformation as Strategic Shift—A Bibliometric Analysis. Studies in Business and Economics, 16(3), 136–151. https://doi.org/10.2478/sbe-2021-0050

Pan, S. L., & Nishant, R. (2023). Artificial intelligence for digital sustainability: An insight into domain-specific research and future directions. International Journal of Information Management, 72, 102668. https://doi.org/10.1016/j.ijinfomgt.2023.102668

Pee, L. G., Pan, S. L., & Cui, L. (2019). Artificial intelligence in healthcare robots: A social informatics study of knowledge embodiment. Journal of the Association for Information Science and Technology, 70(4), 351–369. https://doi.org/10.1002/asi.24145

Petruse, R. E., Grecu, V., & Chiliban, B. M. (2016). Augmented Reality Applications in the Transition Towards the Sustainable Organization. In O. Gervasi, B. Murgante, S. Misra, A. M. A. C. Rocha, C. M. Torre, D. Taniar, B. O. Apduhan, E. Stankova, & S. Wang (Eds.), Computational Science and Its Applications—ICCSA 2016 (Vol. 9788, pp. 428–442). Springer International Publishing. https://doi.org/10.1007/978-3-319-42111-7_33

Rialti, R., Marzi, G., Ciappei, C., & Busso, D. (2019). Big data and dynamic capabilities: A bibliometric analysis and systematic literature review. Management Decision, 57(8), 2052–2068. https://doi.org/10.1108/MD-07-2018-0821

Sambhanthan, A. (2022). A Glossary of Business Sustainability Concepts: In I. R. Management Association (Ed.), Research Anthology on Agile Software, Software Development, and Testing (pp. 67–83). IGI Global. https://doi.org/10.4018/978-1-6684-3702-5.ch005

Sheikh, H., Prins, C., & Schrijvers, E. (2023). Artificial Intelligence: Definition and Background. In H. Sheikh, C. Prins, & E. Schrijvers, Mission AI (pp. 15–41). Springer International Publishing. https://doi.org/10.1007/978-3-031-21448-6_2

Statista. (2023). Artificial Intelligence market size 2030. Statista. https://www.statista.com/statistics/1365145/artificial-intelligence-market-size/

Țîmbalari, C., & Herciu, M. (2023). The Synergy Between Culture and Competitiveness: A Bibliometric Analysis. Studies in Business and Economics, 18(2), 303–319. https://doi.org/10.2478/sbe-2023-0039

United Nations. (1992). Agenda 21. https://sdgs.un.org/sites/default/files/publications/Agenda21.pdf

Upadhyay, A., Mukhuty, S., Kumar, V., & Kazancoglu, Y. (2021). Blockchain technology and the circular economy: Implications for sustainability and social responsibility. Journal of Cleaner Production, 293, 126130. https://doi.org/10.1016/j.jclepro.2021.126130

van Eck, N. J., & Waltman, L. (2018). VOSviewer Manual 2018.

Vinuesa, R., Azizpour, H., Leite, I., Balaam, M., Dignum, V., Domisch, S., Felländer, A., Langhans, S. D., Tegmark, M., & Fuso Nerini, F. (2020). The role of artificial intelligence in achieving the Sustainable Development Goals. Nature Communications, 11(1). Scopus. https://doi.org/10.1038/s41467-019-14108-y

Vrontis, D., Chaudhuri, R., & Chatterjee, S. (2023). Role of ChatGPT and Skilled Workers for Business Sustainability: Leadership Motivation as the Moderator. Sustainability (Switzerland), 15(16). Scopus. https://doi.org/10.3390/su151612196

Webster, M. (2023a, April 11). AI Survey: How 3,812 Digital Marketers Are Using AI in 2023. https://www.authorityhacker.com/ai-survey/

Webster, M. (2023b, May 24). 149 AI Statistics: The Present and Future of AI [2023 Stats]. https://www.authorityhacker.com/ai-statistics/

Weed, M. (2006). Sports Tourism Research 2000–2004: A Systematic Review of Knowledge and a Meta-Evaluation of Methods. Journal of Sport & Tourism, 11(1), 5–30. https://doi.org/10.1080/14775080600985150

Woodward, M. (2022, March 24). Artificial Intelligence Statistics For 2023. https://www.searchlogistics.com/learn/statistics/artificial-intelligence-statistics/