Bibliometric Analysis of Artificial Intelligence

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ABSTRACT

Artificial Intelligence Bibliometric Analysis (AI) is a study involving quantitative measurement and evaluation of scientific literature on artificial intelligence. Relevant keywords in this analysis include "artificial intelligence", "machine teaching", "deep training", and "This method allows researchers to identify major developments and focus in artificial intelligence research, provide insight into the authors' contributions, and understand the direction of this science. Artificial intelligence is a branch of computer science that focuses on developing computing systems that can perform tasks that normally require human intelligence. Using algorithms and mathematical models, AI can process data quickly, identify patterns, and make intelligent decisions.AI development has created applications that have changed the way we work, learn, and interact. From efficient automation systems to virtual assistants that understand and respond to human conversations, AI has made significant contributions to improving productivity and quality of life. We use VOSviewer software to classify the material after reviewing the database.

Keywords: Bibliometric, Artificial Intelligence, Vosviewer

1. INTRODUCTION

Artificial intelligence (AI) rapidly dominates the health service system. It removes the manual health system into automatic, in which humans conduct the routine works/tasks in medical practice to the management of patients and medical resources. The technical challenges of digitizing health services pose new problems when developers create artificial intelligence systems to carry out tasks [1].

This system was later referred to as an Intelligent Tutoring System (ITS) (Sleeman and Brown, 1979). Another important prototype that sets the foundation for ITS development is MYCIN (Shortliffe et al., 1975), an expertise system that helps physicians with diagnosis and therapies of bacteria infected patients. This seminal work has embedded tutoring approaches with domain expertise so that knowledge becomes accessible to learners. The AIEd literature then rolled out from the ITS strand and evolved into a broad field with different themes and paradigms. The scale and scope of AIEd research hasescalated quickly with the advancement of AI technology in education [2]. The agricultural sector faces numerous challenges such as sustainability, digitalization, food safety, and the crucial need for more efficient agri-food supply chains [3].

As a contribution, we seek to inform both the academic community and professional sector with insights to where AI is potentially lacking and where it is thriving. This work scientifically reviews existing literature, identifying what has been accomplished by organizing T-HRIS components on a technical and managerial spectrum. Given the ever evolving state of technology and newer applications coming to fruition within HRM, the implications of this research are imperative for academics and industry professionals to historically understand the direction research has taken with regards to AI and T-HRIS. This historical understanding will provide insight to potential deficiencies and boons which may exist with regards to AI applications [4]. Artificial Intelligence find its applications in different context in to day's business scenario. Practitioners and academicians believe that Artificial Intelligence is the future of our society Technological disruptions

such as artificial intelligence (AI), internet of things (IoT), big data analytics (BDA) have offered digital solutions for attracting and maintaining the customer base [5].

AI is a field in computer science encompassing the development of systems capable of performing tasks that normally necessitate human intelligence [6]. Aside from energy, the benefits of the oil and gas sector also include its contributions to the socio-economic development of a country, suchas employment, increasing local and national revenues, and creating more infrastructures that could benefit the people [7].

Technological innovation developments in organizations have been the object of increasing scholarly attention over the last few decades as firms have rapidly discovered how to use technology to enhance their innovativeness and performance[8] Artificial intelligence (AI) is playing a core role in the Fourth Industrial Revolution (Industry 4.0), i.e., the digitalization era, wherein intelligent systems and technologies are used to create an active connection between the physical and virtual (digital) worlds [9]. Artificial intelligence (AI) is a technology that can perform complex tasks that require human intelligence, and it holds the potential of exceeding human capabilities [10].

In the last fifty years, the topic of Artificial Intelligence (AI) hasreceived renewed attention from academic scholars. The Dartmouth Research Project defined AI as the problem of "making a machine be have in ways that would be termed intelligent if a human being be haved like this" (McCarthy et al., 1955)[11].

Table 1. Some bibliometric analysis that has been done by previous researchers on the topic of artificial intelligence.

Author & Year	Number Document Analized	Source	Findings
[1]	123	SCOPUS	The paper "Artificial intelligence in healthcare: opportunities and risk for future" outlines the noteworthy advantages that artificial intelligence (AI) offers in the field of medicine. These advantages include the ability to enhance patient diagnosis, treatment, and prevention, as well as to lower costs and advance equity in access to healthcare. The study does, however, also highlight the ethical issues and difficulties that AI clinical applications confront, including those related to safety, efficacy, privacy, bias, and access. It highlights how crucial it is to eliminate biases in training data sets for AI models and how patient privacy and autonomy rights must be carefully taken into account in AI applications. Overall, the study highlights the potential advantages of artificial intelligence (AI) in healthcare while emphasizing the urgent need to address privacy, equality, and ethical issues related to its application.
[2]	221	SCOPUS	Leximancer, a program that finds important concepts and schemes in textual data, has been used to analyze AI-enabled pedagogical adaption research throughout the past 20 years, according to the references given. Research regions have been mapped using this method, which has also been used to identify main research subject streams in scholarly publications and analyze topics and research trends across time. Since titles and abstracts are regarded as "lexically dense" and usually highlight the main points made in articles, they

			have been the subject of the analysis. It has been discovered that this technique works well for mapping a research region, saving money and time, and minimizing bias resulting from human interpretation. The analysis has also looked at online communications in the tourism industry, human language and psychology, and conceptual analysis in literature review investigations. The above references provide information on how to apply Leximancer and computer-assisted content analysis to comprehend research areas and trends throughout time.
[12]	239	SCOPUS	Customized pricing, tailored recommendations, better customer experiences, and enhanced marketing analytics are just a few of the potential opportunities for marketing practice and academic research that the rapid advancement of AI has brought to light. The study also emphasized the need for more research in a number of areas, including the ethical implications of AI in marketing, the effect of AI on employment and job displacement, and the development of AI capabilities within firms.In order to prevent the subjective biases that are frequently present in non-systematic literature reviews, expert surveys, and opinion pieces, the study integrated topic modeling with scientometric analyses and employed statistical techniques, machine learning, and natural language processing to examine the literature.
[9]	369	SCOPUS	Highlight the gaps in the literature and offer directions for further study. They suggested that robotic automation and convolutional neural networks might be used to solve AEC issues in future research. The study provides an easily accessible point of reference for the field of practice. policy makers, researchers, and development (R&D) organizations. As a result, this study increases awareness of AI and makes it easier for the AEC industry to develop the intellectual capital of the AI field.
[13]	438	SCOPUS	Early research concentrated on algorithmic and high-frequency trading, portfolio optimization, pricing and valuation, as well as text mining and sentiment analysis. Over time, the subject organization of AI and ML research in finance has changed. More recent studies have focused on big data analytics, FinTech, pricing and value, text mining and sentiment analysis, and Three broad clusters emerge from the core clusters of AI and ML research in finance: financial fraud, risk, and failure; inferring sentiment and predicting; and financial asset sources, valuation, and optimization.
[11]	533	SCOPUS	In the realm of operations research, the application of Artificial Intelligence (AI) based methods, like rule-based induction, has been investigated to increase forecasting accuracy.The research on AI and its effects on sustainable business models has been conducted more frequently between 1990 and 2019, especially after 2014. The United Nations' 2030 Agenda and its objectives were adopted at the same time as this spike in interest, suggesting that the convergence of artificial intelligence, corporate sustainability, and environmental management is receiving more attention.The literature has addressed

			AI's function in knowledge management, emphasizing how it may help with the systematic review process to produce management knowledge that is supported by evidence. These results point to a possible trend toward incorporating AI into the creation of evidence-based management knowledge and sustainable business models, suggesting an increasing interest in using AI to improve forecasting accuracy, knowledge management, and sustainable business practices.

Artificial intelligence (AI) makes decisions based on predefined criteria through algorithms and machine learning models. These algorithms are trained on large datasets, learning patterns and relationships in data; in part two, future trends in the use of artificial intelligence cover several fields. Increased integration of AI in health care for diagnostics and personalized care, advances in natural language processing for more sophisticated human-computer interactions, and the emergence of AI-driven autonomous systems in industries such as transportation is expected; in part 3 Research on Artificial Intelligence covers a wide range of topics. Machine learning algorithms Natural language Processing etc: in part 4 research on AI systems that can adapt and learn continuously in dynamic environments without forgetting previous knowledge. These fields present an exciting prospect for advancing the field of artificial intelligence and addressing emerging challenges.

2. METHODS

This research uses a method of bibliometric analysis. Bibliometric analysis research methods answer research questions by looking at the development of research and literature. The analysis used is evaluative and descriptive bibliometric analysis. The researchers used the Scopus database to search for data sources related to "Artificial Intelligence in High School Students" due to its extensive interdisciplinary coverage.

2.1 Search For Specific Journals on The Topic of Artificial Intelligence

Bibliometrics can solve the above problem. It's a research method that is widely used by libraries and researchers. It uses quantitative and statistical analysis to find patterns of publication in a particular field. Automation in Construction (AIC), Journal of Business Research (JOBR) Cleaner Engineering and Technology (CEaT) International Journal of Production Economics (IJoPE) Technovation (Tcn) International Journal of Innovation Studies (IJoIS).

2.2 Journal reputation

At this stage, magazines that have a good position are late selected and are still in the process today. Table 2 displays the log check results

Table 2. Profile of a journal Artificial Intelligence

Point of View	AIC	JoBR	CEaT	IJoPE	Tcn	IJoIS
Publisher	Elsevier	Elsevier	Elsevier	Elsevier	Elsevier	Elsevier
First published	2019	2020	2021	2020	2022	2020
Last published	2020	2020	2022	2021	2022	2020
Scopus Indexed	Yes	Yes	Yes	Yes	Yes	Yes
Web of Science Indexed	No	No	No	No	No	No
Impact Factor by SJR	2,44	2,9	0,78	3,03	2,41	0,69

Based on table 2, there are only 6 journals that are indexed scopus with AIC classified by Q1, JoBR classified with Q1, CEat classified as Q1, IJoPE classified in Q1, Tec classified into Q1 and IJoIS classified through Q2 in this case it is also important to be analyzed as it is the first journal specifically about artificial intelligence.

2.3 Journal Metrics Information

The section explicitly describes the profiles and metrics of the three selected journals, namely, JoBR, IJoPE,Tcn. Table 3 shows some important things to know from the 3 selected journal. This metric information was obtained from metadata information using the Publish or Perish (PoP) application in December 2023.

Table 3. Metrics information of selected journals

Metrics data	JoBR	IJoPE	Tcn
Publication years	2020-2020	2021-2021	2023-2023
Citation Years	4	3	1
Papers	1	1	1
Citations	533	175	60
Cites/year	133.25	58.33	60.00
Cites/paper	533.00	175.00	60.00
Cites/author	133.25	43.75	15.00
Papers/author	0.25	0.25	0.25
Author/Paper	4.00	4.00	4.00
In-index	1	1	1
g-index	1	1	1
hI.norm	1	1	1
hI, annual	0.25	0.33	1.00
hA-index	1	1	1

2.4 Reference Management

After all, the article has been downloaded from two journal sites, and the next step is to set references using the Mendeley application. Mendeley is a computer and online program developed by Elsevier to manage and share research papers, search research data, and collaborate online with applications that help you in the insertion, writing, and formatting of citations. References are needed to ensure that the meta data for each article is complete, such as information about the author, keywords, abstracts, and other information is arranged more easily and fully.

2.5 Bibliometric analysis

After all the article metadata is fully confirmed, the next step is to perform a bibliometric analysis. The application used to analyse bibliometrics in this article is VosViewer It is an application developed by the Centre for Science and Technology Studies (CWTS) of Leiden University. There are three functions this application can perform, namely: data, visualization and engineering based on a database file.csv is donwloaded from scopus site with search keywords about Artificial Intelligence.

3. RESULTS AND DISCUSSION

To answer the first purpose of this journal about artificial intelligence, some journals are based on a csv database that is donwloaded from the scopus then for analysis using the VosViewer software, through the creation of maps based on text data using titles and abstract fields, with the method of counting binner there are 4002 terms that are found. With this minimum number of incidents from a period of 6 times, 240 thresholds were found. However, for each of the 240 terms,

the revanche score will be counted. Based on this score, the most relevant term will be automatically selected by default as much as 60% so we get the 144 most suitable words, however, the verification process still has to be done manually by removing unrelated words. So the total word that can be inserted in making the map is 144.
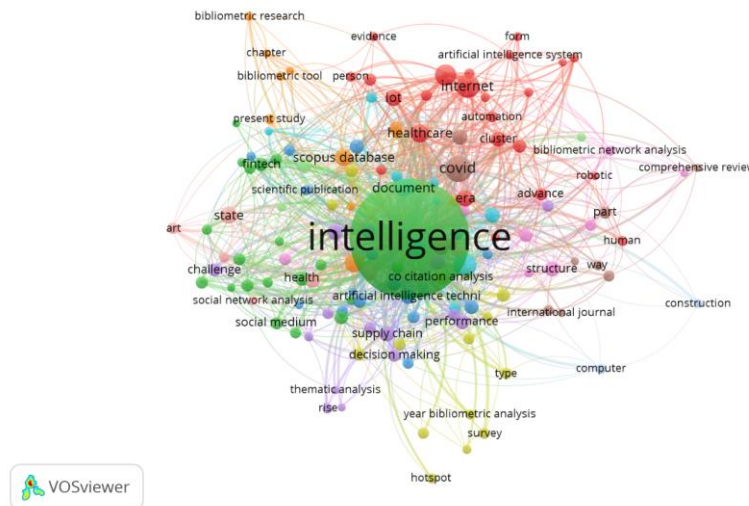

Figure 1. Network Visualization Map of Keywords

Based on Figure 1, there are several groups marked with the colours Green, Blue, Red, Yellow, Purple and Orange. Based on the total article, some of the words in the cluster appear most often. This cluster shows that so far there are six classifications of articles published. More details can be found in table 4.

Table 4. Clusters and keywords therein

Cluster	Total Items	Most Frequent Keyword (occurrences)	Keywords
1	24	Internet (43) thing (37) healthcare (26)	Advance, artificial intelligence system, automation, bibliometric map, cloud computing, cluster, co occurrence analysis, digital marketing,drone,era evidence, form,healthcare, human, internet,iot, person, research hospot,robotic, scope, societytelemedicine,thing
2	20	Intelligence (1095), health (17)	Accouting, addition, adoption, bibliometric mapping big data analytic, blockchain technology circular economy, digital technology, fintech, health, importance, intelligence, interest period, scientific literature, scientific research, smart city, social medium, term, virtual reality
3	17	Artificial intelligence technique (20) relationship (17)	Analytic, artificial intelligence technique, artificial intelligence tool, bibliometric indicator, bibliometric survey, decision, digital transformation, metaverse order, past, pattern, process, relationship, scientific publication, supply chain management, sustainable development, total
4	15	co citation analysis (17)	citation analysis, cite space, co citation analysis computer science, country, global research trend hotspot, institution, keyword analysis, publication trend, research area, robot, survey, type year bibliometric analysis

5	14	Future (19) Bibliometric approach (19)	artificial neural network, attention, bibliometric approach, business intelligence, challenge, decision making, digitalization, ethic, future, future research agenda, performance, reise, supply chain, thematic analysis
6	12	Science (42) web (29) document (25) scopus (22)	Agriculture, bibliometric data, chatgpt, current state develoment trend, digital twin, document, science scopus, virtual analysis, web, wos
7	11	Database (31) scopus database (25)	bibliometric research, bibliometric tool, chapter characteristic, current study, database, discipline present study, scientific production, scientometric analysis, Scopus database
8	11	Covid (58) Artificial intellingece research (20)	artificial intellingece research, comprehensive bibliometric analysis, comprenshive review, covid, higher education, internal journal, light, pandemic part, performance analysis, way
9	8	Structure (18) data mining (11)	bibliometric network analysis, data mining data science, engineering, intelligent system knowledge system, set, structure
10	7	State (23) tourism (18)	Art, future research, hospitality, research agenda social network analysis, state, tourism
11	3	Manufacturing ((17) Critifical analysis (7)	critical analysis, manufacturing, sustainability
12	2	Construction (7) computer (9)	Computer, construction

Then, to answer what the trends in artificial intelligence research are, we can look at the answers from the cluster itself. Figure 2 shows a density visualization on the article. Cluster 2 with the Intelligence word becomes the most frequently appearing word.
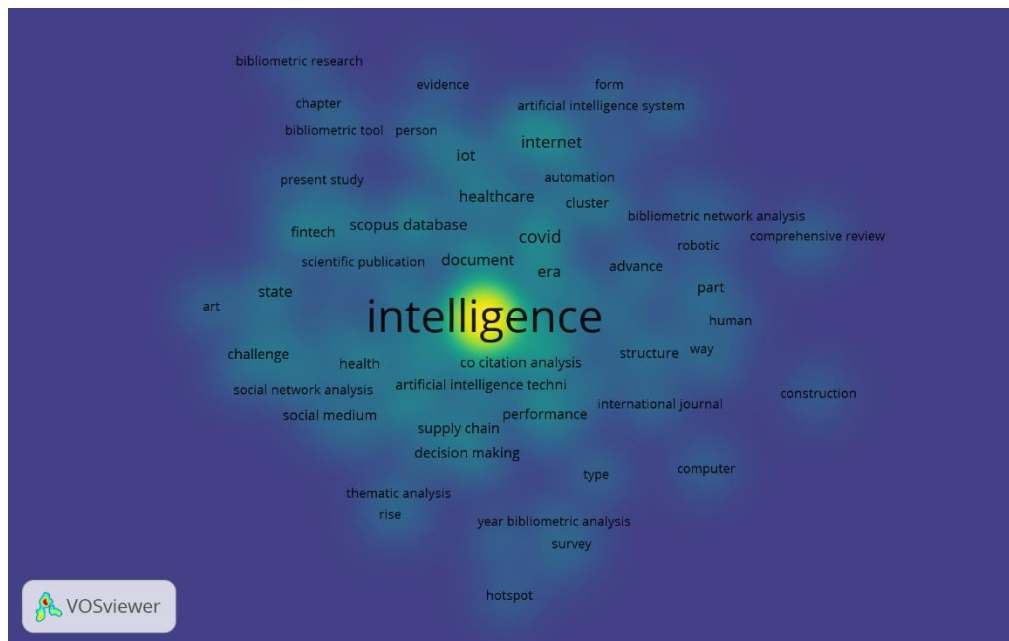

Figure 2. Density Visualization Map of Keywords

There's a cluster of these mapping results that appears at least in the keyword that cluster 2 covers topics about artificial intelligence in each cluster, there's also a few words that rarely appear

from those mappings. That means there's still research that's going to be a trend in the future that is, of course, adapted to the conditions of this world and the future. Artificial intelligence is a technology designed to make a computer system capable of imitating human intellectual abilities that are very rapidly evolving.
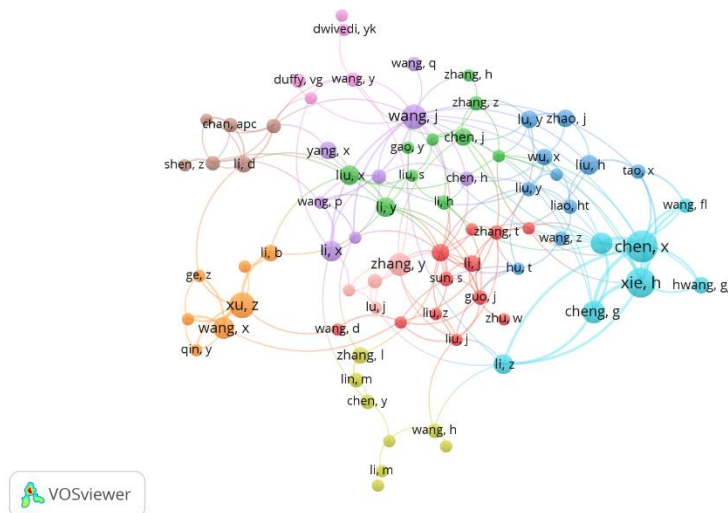

Figure 3. Network Visualization Map of Authors

Based on the figure 3 can be seen there are 4 big names of each claster including the blue claster Chen x, the purple claster money j, the red claster Zhang j, orange classter money x. In the picture only the authors related in their publications are displayed. But among the clusters above the most is the blue culster that is chen x with 19 documents. And according to the AI research paper, it's already around 2021-2022.

CONCLUSION

The branch of computer science called artificial intelligence concentrates on the creation of computing systems that can perform tasks that normally require human intelligence. AI can identify patterns, process data quickly, and make intelligent decisions using mathematical models and algorithms. Automation in Construction (AIC), Journal of Business Research (JOBR), Cleaner Engineering and Technology (CEaT), International Journal of Production Economics (IJoPE), Technovation (Tcn), and International Journal for Innovation Studies (IJOIS) are all the journals that compile this article.

This study has at least two limitations. First, this research relies largely on journals that are indexed in scopus, although there are some other high-quality magazines, such as Thomson Reuters. Although this study uses formal tools such as PoP software, VOSviewer, and Mendeley, the author's subjective judgment exists and can identify errors. Although not indexed by Scopus, future studies should use complex sample sizes and involve several other sources. of Innovation Studies.

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