

Bibliometric Analysis of Accounting Literature on Artificial Intelligence (AI) Adoption in Organizational Functions

Aminu Abdullahi^{1*}

Aliyu Abubakar²

¹Department of Accounting Usmanu Danfodiyo University, Sokoto, Nigeria

²Department of Accountancy, Waziri Umaru Federal Polytechnic Birnin Kebbi, Kebbi State, Nigeria

*Correspondence Email : aminukaura.aa@gmail.com; abubakaraliyu132@gmail.com

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Abstract

Artificial Intelligence (AI) is a powerful technology with high potentiality of transformative drive from traditional analog to digitalized organizational seamless decision process efficiently and effectively. AI is an emerging area in organizational decision making with limited number of studies across the globe. However, AI is now gaining considerable attention from the researcher both at local and international level. This study aims at providing a systematic review and biometric analysis on AI adoption in organizational function using Google Scholar databases as the source of data. The study employs the steps of Prepare Reporting Items for Systematic Literature Review and Meta-Analysis techniques PRISMA (2020) and bibliometric analysis techniques using VOS-view as a tool for analysis of publications performance overtime with a view to determine the most influential articles, publication productivity, direction of studies on AI Adoption in organizational functions for a period of ten years from 2015 to 2024. The analysis reveals that, article publishes in 2016 by sage journal records the highest citation of 2707 followed by MDPI journal with total citations 1922 in 2021 while Elsevier presents the lowest cited of 87 citations over the period of 10 years in the databased used. These articles were written on more than 20 areas of application of AI in organizational functions.

Keywords: Artificial Intelligence (AI), Co-Authorship, Keyword Co-occurrences, Bibliometric Analysis Organizational/Function.

1.0 Introduction

Artificial intelligence (AI) refers to the technology capable of performing complex tasks which has the potential of exceeding human capabilities. In this 21th century AI has become the major drivers of industrial development through integration and promotion of the emerging technology (Goodell et al., 2021). In areas of organizational management accounting inclusive AI is reviewed as the transformative leap to the industries in managing risk and leveraging enormous data set through the power of algorithms process in real-time. It serves as formidable weapon in detecting fraud, risk management, forecasting, optimization, segmentation, automation, prediction, recruitment and retention of employees and many more organizational decisions and operations through artificial empowered intelligence algorithms in different sector and industries.

Furthermore, for institutions to successfully, compete and survive in this era of fourth industrial revolution, it most transformed to digitalized system that require reconfiguration of the business in such a way that technology becomes central to the business operation that provide a speedy response to the digital technological adaptation demands in the work environment and market places. Unlike the traditional manual system which mostly depend on human capabilities that always struggle with new challenges, inconsistencies and errors. AI powered system have high potential of detecting anomalies through an endlessly learning, of classifying, analyzing, and recognizing patterns evolve with fraud quickly by flagging suspicious behaviors and transactions that indicate presence of fraudulent activities and events. This proactive approach of AI based system enables business, organizations and industries

to proactively respond to potential threats and thereby curtailing possible financial and non-financial losses and risks.

However, AI is a powerful technology well positioned to handle the transformation drive from traditional analog to digitalized economy with the potential of to reform the existing organizational processes efficiently and effectively, by providing seamlessness operational process. This give raised to a host of interest by researchers from different background, counties, professions and on different aspect of AI and organizational decisions and operations such as; Abaku, and Edunjobi (2024), Hassan, Ewuga, Abdul, Abrahams, Oladeinde, & Dawodu, (2024). Khang (2023), Ooi, (2023), Alhamzah et, al.,2020 and Satish et, al., (2022) among several studies. Nevertheless, Kumar et al (2023) opines that, though studies on adoption of AI in business exist but there are gaps on AI integration/utilization in decisions making, operations and are still not clear and disjointed. Hence, this paper attempts to provide researchers with the trend and development of AI adaptation for various organizational decisions and operations by means of a systematic review and bibliometric analysis of literature, with the following questions set to guide the conduct of the study: What is the publication productivity of the research on Artificial Intelligence (AI) Adoption in organizational decisions and operations? What are the most influential article on Artificial Intelligence (AI) Adoption in organizational decisions and operations? What are the most prominent topics on Artificial Intelligence (AI) Adoption in organizational decisions and operations? What are the most keyword co-occurrence in the study of AI Adoption in organizational decisions and operations?

The analyses of the study articles present several contributions that include: the directions of studies on the AI adoption from various sectors and clusters which such insight will be of great relevant to the future studies to gain a scientific overview of existing literature in the area. Secondly, it also provides the direction of studies on AI adoption. Thirdly, the use of bibliometric analysis in this study exposed the existing gap and the shortcomings in the previous studies. Moreover, in addition to the introduction other sections of this article include; methodology, presentation and analysis of results and conclusion, as the whole study is about literature review.

2.0 Literature Review

Bibliometric analysis is the application of mathematical and statistical method in analyzing studies. It was first developed and used by Pritchard (1969). It applied quantitative analysis of existing empirical published literature for assessing the patterns of publication within a particular area or field of study (De Bellis, 2009). Bibliometrics analysis assist researchers in examining the body of literature in their area of interest through identify major themes (Grant et al., 2000; Vogel and Güttel, 2013). Bibliometric analysis combined science mapping techniques to visualize the intellectual structure of a researcher area of study interest (Cobo et al., 2011). The Analysis consist of several methods depending on the different information used in the Bibliometrics data set (Van Raan, 2005). The most popular bibliometric analysis used include citation-based analysis, keyword co-occurrence analysis or co-word analysis, and co-authorship collaboration analysis (VanEck and Waltman, 2014).

In the citation-based analysis, further classification are bibliographic coupling, citation analysis, and co-citation analysis, (Van Eck and Waltman, 2014). Co-citation analysis is the most widely used bibliometric analysis method (Ding et al., 2001), and is define to mean two publications which are cited together in one article (Small, 1973). Suggesting that, when two article published are frequently co-cited by the other authors, it is an indication that these two references have something in common (Benckendorff and Zehrer, 2013). Co-citation analysis is used to discover the clusters of co-citation pairs, thereby enhancing

scholars to obtain an insights knowledge of the cumulative tradition, and intellectual structure of scientific research articles (Small, 1978; Culnan, 1986; Pasadeos et al., 1998).

Co-citation analysis has been considered as the superior in showcasing disciplinary structures compared to other bibliometric analysis methods (Bichteler and Eaton, 1980; Chang et al., 2015), yet it has not been able to provide a content picture of the research topics dealt with in the literature. On the other hand, co- was developed to address this kind of analytical problem (Callon et al., 1991).

Co-word analysis is done on the bases of the frequency of co-occurrence of author's keywords used in the reviewed studies that is, the number of papers in which two keywords appear together (Whittaker, 1989). This will measure the strengths of the keyword co-occurrence links, co-word analysis visualizes and reveals the association between keywords (Callon et al., 1991; Su and Lee,2010). keywords are the terms used to demonstrate the core of a research article, co-word analysis is often used to explore the concept network of research topics and trends in a specific discipline (Callon et al., 1991; Ding et al., 2001). However, term changes over time posted in stability weakness to co-word analysis (Leydesdorff, 1997; Astrom, 2002).

This method is considered efficient and effective in tracking the trend of literature over a period of time, this study therefore adapts this method in order to analyze publications performance overtime with a view to determine the most influential articles, publication productivity, direction of studies on AI Adoption in organizational functions for a period of ten years from 2015 to 2024

3.0 Methodology

The study employed the use of Prepare Reporting Items for Systematic Literature Review and Meta-Analysis techniques PRISMA (2020) and bibliometric analysis using VOSview as a tool for the analysis of publications performance overtime to determine the most influence articles, publication productivity, direction of studies on AI Adoption in organizational decisions and operations which is consistent with the study by (Alhamzah et, al.,2020 and Satish et, al., 2022). The methodology is recognized as a scientific enquiry for having application in various disciplines (see: Donthu et, al., 2021, Kumar et al., 2021, Zupic & Cater, 2015) among others.

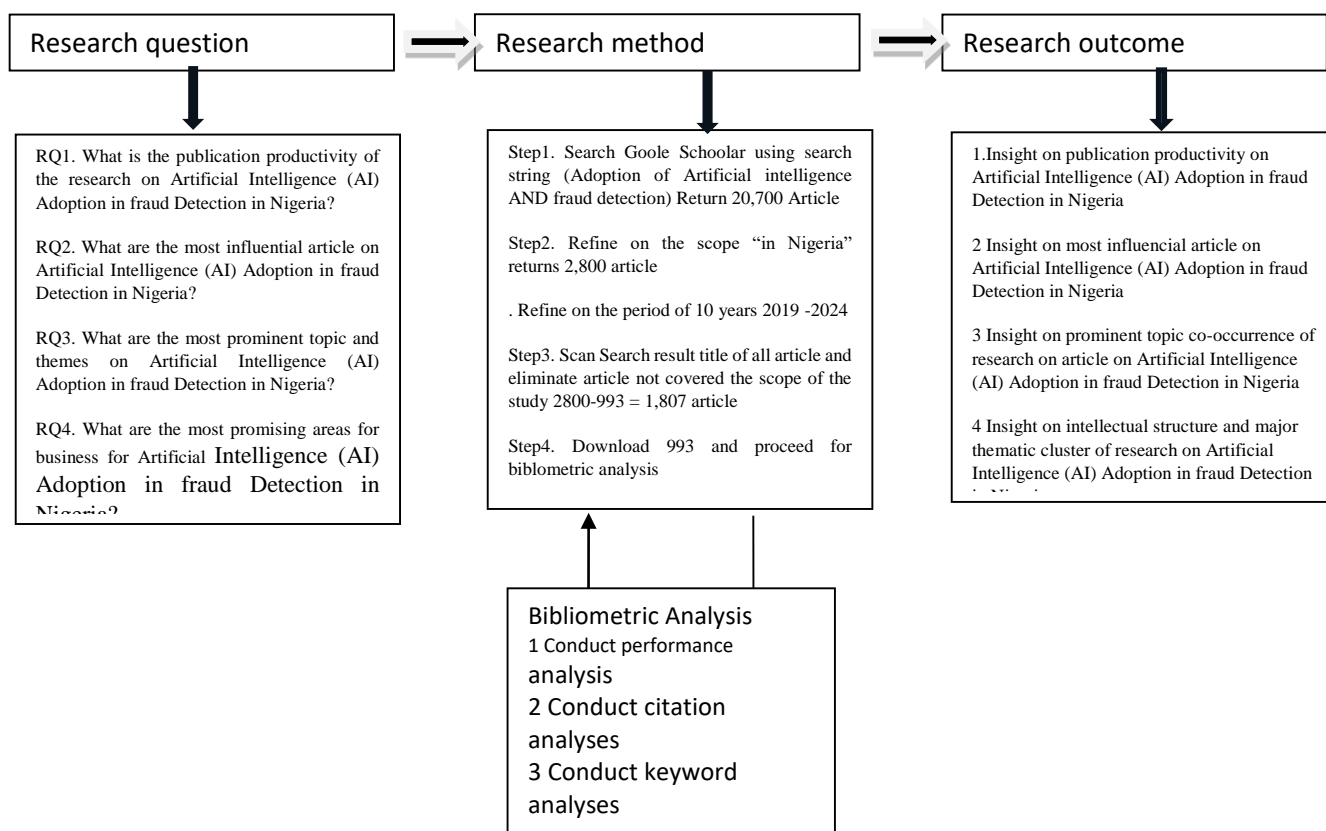


Fig. 1 Research design and analysis scheme

The bibliometric analysis encompasses productivity of publication over a period of 10 years 2016-2024 and is limited to Google Scholar Data base. It measures aspect such as Articles citations, publication productivity, co-authorship trend and keyword co-occurrences analysis to unpack the major authors in the area of AI adoption in fraud detection in Nigeria.

4.0 Results and Discussion

Analysis, Interpretation and Presentation of Results

The last step of the study is conducting analysis and reporting the findings. In doing so the study utilized VOSviewer (Van Eck & Waltman, 2010) bibliometric Analysis and Microsoft excel to provide visualize output and graphical presentation of the data set from the Google Scholar data base. The findings of bibliometric content analysis are presented on the bases of the study research question that they address. In particular findings related to the article productivity, influential articles, major keyword co-occurrence on AI adoption in organizational decisions and operations respectively over the period of ten year from 2016 to 2024 are organize as follows:

i. Publication Productivity

In order to provide answer to the Question (1) What is the publication productivity of the study on AI Adoption. The study analyzes Google Scholar data base for the period of ten years to explore the trend of productivity in literature as shown in **Fig. 2**. The findings reveal that Adoption of AI is an emerging field of study in the world with few publication between 1992 to 2017 recording total publication between 1 to 8 articles, until 2018 when it start to gets popular and continue to develop high between 18 to 322 articles, which in form the focus of the study period to be limited to 2016-2024 instead of 2015 to 2024

for the significances improvement recorded in AI adoption in which in 2024 alone between January to July 10, 2024 the total number of 322 articles were recorded which signify the technological transformation shift from traditional system to digital base system in organizational operation and decisions makings across various sectors.

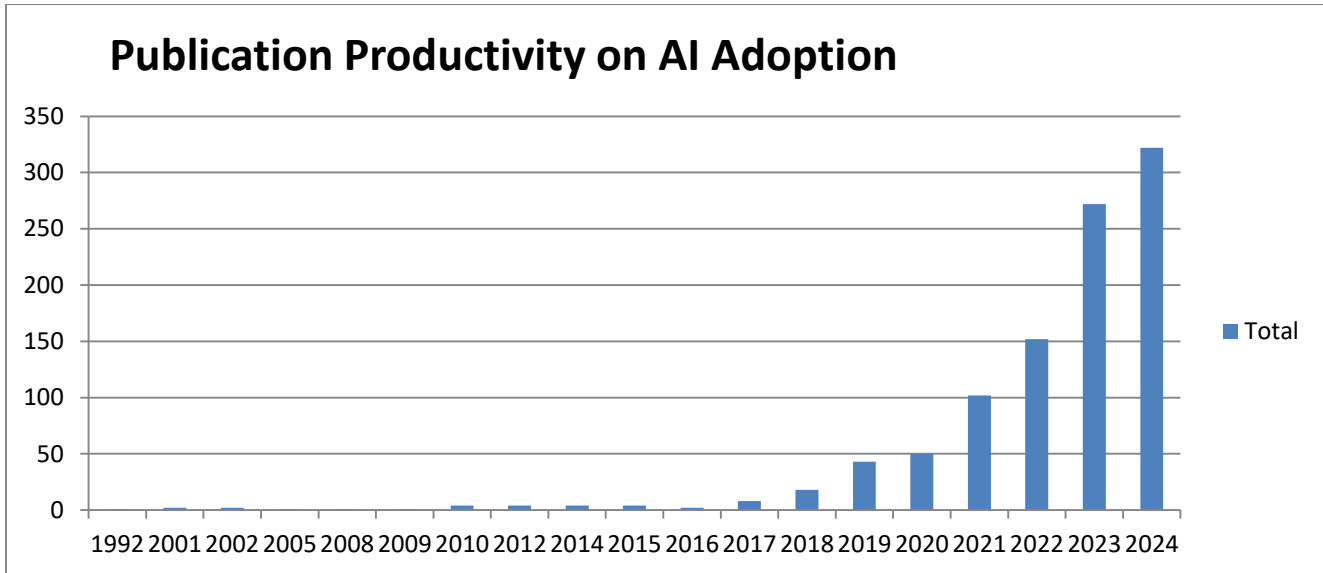


Fig: 2 Article Distributions Over the period (1992-2024)

ii. Most Influential Authors', Most Prominent Topics, and Publishers

In answering questions 2 and 3 on the most influential Authors and the most prominent topics and publisher on AI Adoption, the study conducts an analysis of the total publication to determine the most productive journal over time on the topic of AI adoption on various organizational functions using the most cited article and journal. The result of the analysis reveals that, the article publishes in 2016 by sage journal record the highest citation of 2707 followed by MDPI with total citation 1922 in 2021 while Elsevier present the lowest citation of 87 catenation over the period of ten years see Fig 3 below.

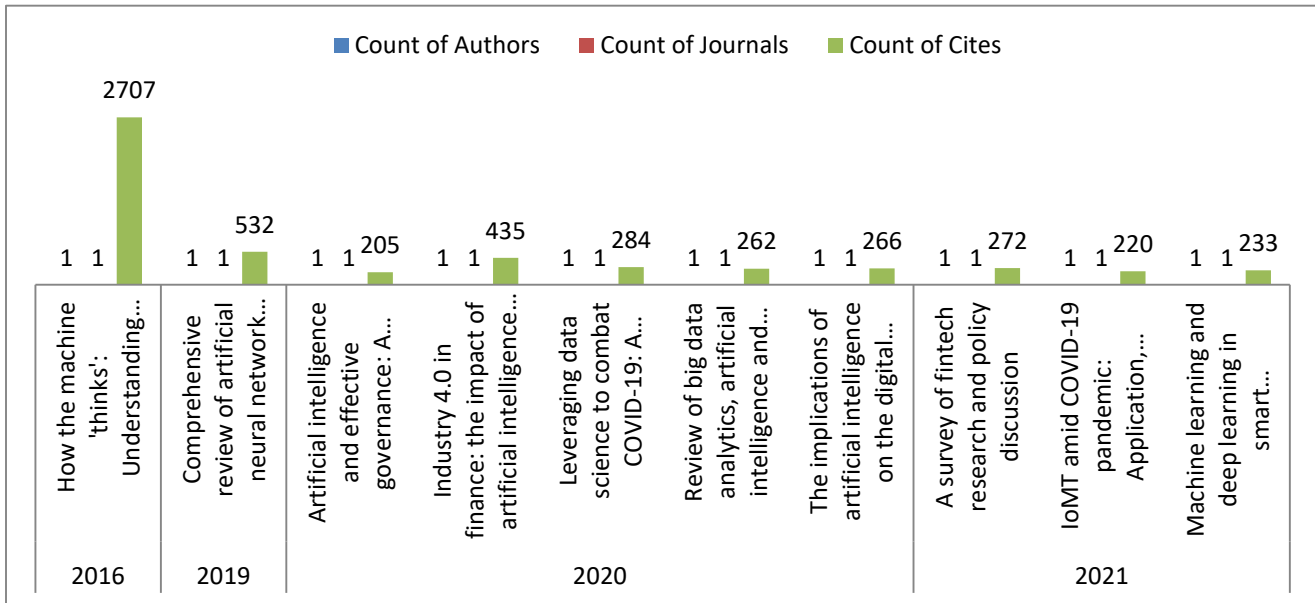


Fig. 3. Distribution of ten most influential Article title, Count of Authors, Count of Journal and Citation Count.

Table1 below contained the information of ten most influential journal/ Database base on total number of publications count on AI adoption over the study period of ten-year 2014 to 2024.

Table:1 TEN MOST INFLUENTIAL PUBLIHERS /DATABASE	NUMBER OF PUBLICATIONS
Elsevier	97
Emerald Publishing Limited	37
IEEE	62
IGI Global	17
International Journal of Science and Research Archive	14
MDPI	103
Springer	77
Taylor & Francis	19
Wiley Online Library	14
World Journal of Advanced Research and Reviews	35
Grand Total	475

The above table indicates that journal of Multidisciplinary Digital Publishing Institute (MDPI) to have the highest number of articles over the study period with 103 articles followed by Elsevier 97, Springer 77, IEEE 62, Emerald 37, World Journal of Advance Research and Review 35, Taylor & Francis 19, international Journal of Science and Wiley online library 14 each. This gives the grant total of the ten most influential journal that published 10 and above article on AI adoption base on publication to 475. This is further demonstrated graphically in figure 4 below:

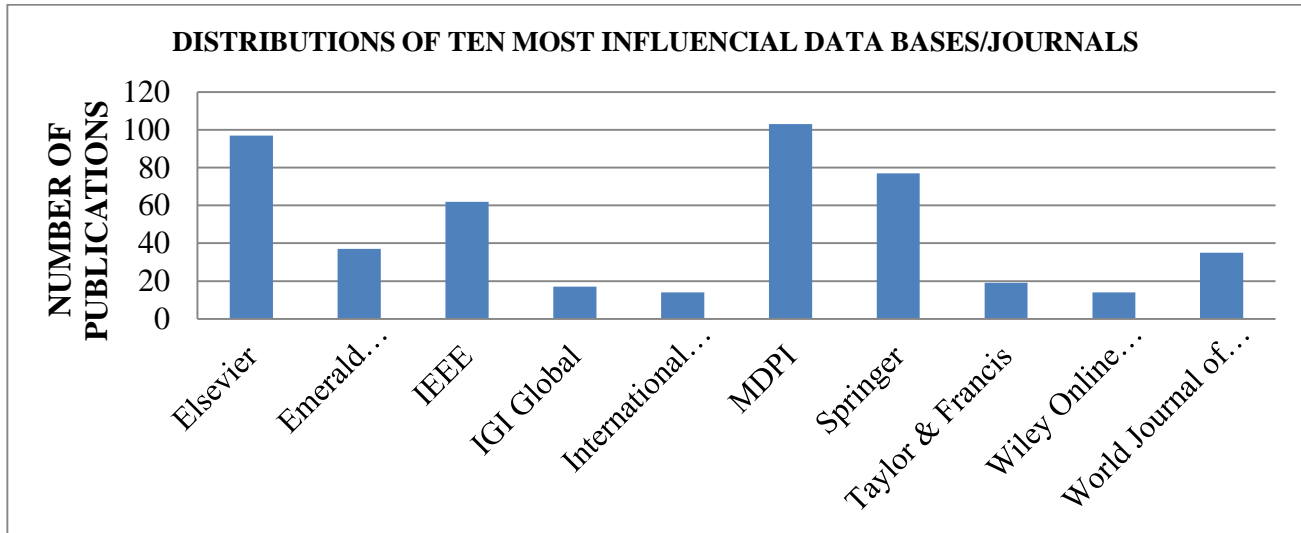


Fig 4 Distributions of the Ten Most Influential Database/Journals

Table 2 below present the most cited article with 50 and above citations in the field of AI adoption base on Title, Authors, and the Year of publication in order provide and understanding of the trend and the area of high impact consideration among previous studies, for the period of ten years (2016-2024) from different sector.

Table 2: Most Cited Topic on Artificial Intelligence

S/N	Year	Title	Authors	Publisher	Cites
1	2016	How the machine 'thinks': Understanding opacity in machine learning algorithms	J Burrell	journals.sagepub.com	2707
2	2019	Comprehensive review of artificial neural network applications to pattern recognition	Abiodun et al.,	ieeexplore.ieee.org	532
3	2020	Industry 4.0 in finance: the impact of artificial intelligence (ai) on digital financial inclusion	D Mhlanga	mdpi.com	435
4	2020	Leveraging data science to combat COVID-19: A comprehensive review	Latif, et al.,	ieeexplore.ieee.org	284
5	2021	A survey of fintech research and policy discussion	Allen, et al.,	papers.ssrn.com	272
6	2020	The implications of artificial intelligence on the digital marketing of financial services to vulnerable customers	Mogaji, et al.,	journals.sagepub.com	266

7	2020	Review of big data analytics, artificial intelligence and nature-inspired computing models towards accurate detection of COVID-19 pandemic cases and ...	Agbehadji, et al.,	mdpi.com	262
8	2021	Machine learning and deep learning in smart manufacturing: The smart grid paradigm	Kotsiopoulos, et al.,	Elsevier	233
9	2021	IoMT amid COVID-19 pandemic: Application, architecture, technology, and security	Aman, et al.,	Elsevier	220
10	2020	Artificial intelligence and effective governance: A review, critique and research agenda	Sharma, et al.,	Elsevier	205
11	2023	Human resource management in the age of generative artificial intelligence: Perspectives and research directions on ChatGPT	Budhwar, et al.,	Wiley Online Library	205
12	2019	A review of the use of artificial neural network models for energy and reliability prediction. A study of the solar PV, hydraulic and wind energy sources	Ferrero Bermejo, et al.,	mdpi.com	202
13	2022	Robotics cyber security: Vulnerabilities, attacks, countermeasures, and recommendations	Yaacoub, et al.,	Springer	195
14	2021	Financial inclusion in emerging economies: The application of machine learning and artificial intelligence in credit risk assessment	D Mhlanga	mdpi.com	173
15	2021	A review on artificial intelligence in education	Huang, et al.,	pdfs.semanticscholar.org	168
16	2018	Digitalisation and big data mining in banking	Hassani, et al.,	mdpi.com	167
17	2021	Artificial Intelligence (AI) in accounting & auditing: A Literature review	AR Hasan	scirp.org	159

18	2021	Artificial intelligence evolution in smart buildings for energy efficiency	Farzaneh, et al.,	mdpi.com	158
19	2019	Informed consent and medical artificial intelligence: What to tell the patient?	IG Cohen	HeinOnline	153
20	2019	Artificial intelligence supported patient self-care in chronic heart failure: a paradigm shift from reactive to predictive, preventive and personalised care	Barrett, et al.,	Springer	149
21	2020	The Fourth Industrial Revolution and digitization will transform Africa into a global powerhouse	N Ndung'u, L Signé	fully-human.org	147
22	2020	Ai meta-learners and extra-trees algorithm for the detection of phishing websites	YA Alsariera, VE Adeyemo, AO Balogun...	ieeexplore.ieee.org	147
23	2019	Machine learning and multi-agent systems in oil and gas industry applications: A survey	KM Hanga, Y Kovalchuk	Elsevier	143
24	2022	Managers' understanding of artificial intelligence in relation to marketing financial services: insights from a cross-country study	E Mogaji, NP Nguyen	emerald.com	135
25	2022	Artificial intelligence in green building	C Debrah, APC Chan, A Darko	Elsevier	131
26	2023	The potential of generative artificial intelligence across disciplines: Perspectives and future directions	KB Ooi, GWH Tan, M Al-Emran...	Taylor & Francis	128
27	2022	The emerging threat of ai-driven cyber attacks: A review	B Guembe, A Azeta, S Misra, VC Osamor...	Taylor & Francis	124
28	2023	AI and IoT-based technologies for precision medicine	A Khang	books.google.com	122
29	2018	Effect of artificial intelligence on the performance of accounting operations among	LC Odoh, SC Echefu, UB Ugwuanyi...	academia.edu	119

		accounting firms in South East Nigeria			
30	2022	Artificial intelligence in customer-facing financial services: a systematic literature review and agenda for future research	JK Hentzen, A Hoffmann, R Dolan...	emerald.com	118
31	2021	Sustainable aquaculture development: a review on the roles of cloud computing, internet of things and artificial intelligence (CIA)	UF Mustapha, AW Alhassan, DN Jiang...	Wiley Online Library	115
32	2019	Artificial intelligence technologies in education: benefits, challenges and strategies of implementation	ML Owoc, A Sawicka, P Weichbroth	Springer	107
33	2019	Artificial Intelligence. Ethics, governance and policy challenges	A Renda	ceeol.com	105
34	2018	Machine learning: the new 'big thing' for competitive advantage	M Attaran, P Deb	inderscienceonline.com	102
35	2020	Usage and impact of artificial intelligence on accounting: Evidence from Malaysian organisations	CS Lee, FP Tajudeen	ajba.um.edu.my	99
36	2022	Artificial intelligence based decision-making in accounting and auditing: ethical challenges and normative thinking	OM Lehner, K Ittonen, H Silvola, E Ström...	emerald.com	96
37	2017	Critical review of hedonic pricing model application in property price appraisal: A case of Nigeria	RB Abidoeye, APC Chan	Elsevier	87
38	2019	The role of artificial intelligence in supporting development in emerging markets	D Strusani, GV Houngbonon	pdfs.semanticscholar.org	85
39	2020	Artificial intelligence for cybersecurity: a systematic mapping of literature	I Wiafe, FN Koranteng, EN Obeng, N Assyne...	ieeexplore.ieee.org	82
40	2022	How Artificial Intelligence Is Promoting Financial Inclusion? A Study On	A Yasir, A Ahmad, S Abbas, M Inairat...	ieeexplore.ieee.org	81

		Barriers Of Financial Inclusion			
41	2022	Thematic analysis of financial technology (Fintech) influence on the banking industry	P Varma, S Nijjer, K Sood, S Grima, R Rupeika-Apoga	mdpi.com	79
42	2024	Cybersecurity in banking: a global perspective with a focus on Nigerian practices	AO Hassan, SK Ewuga, AA Abdul...	fepbl.com	78
43	2023	Explainable artificial intelligence (xai) for intrusion detection and mitigation in intelligent connected vehicles: A review	CI Nwakanma, LAC Ahakonye, JN Njoku...	mdpi.com	75
44	2021	Financial services experience and consumption in Nigeria	TO Soetan, E Mogaji, NP Nguyen	emerald.com	74
45	2023	Business intelligence transformation through AI and data analytics	EO Eboigbe, OA Farayola, FO Olatoye...	fepbl.com	72
46	2018	Artificial intelligence and human development: toward a research agenda	M Smith, S Neupane	idl-bnc-idrc.dspacedirect.org	69
47	2023	Fourth industrial revolution – a review of applications, prospects, and challenges for artificial intelligence, robotics and blockchain in higher education	C Chaka	rptel.apsce.net	69
48	2023	Exploring the potential of artificial intelligence tools in educational measurement and assessment	VJ Owan, KB Abang, DO Idika, EO Etta...	ejmste.com	67
49	2019	Handbook of research on deception, fake news, and misinformation online	IE Chiluya, SA Samoilenko	books.google.com	65
50	2020	Internet banking in Nigeria: Cyber security breaches, practices and capability	V Wang, H Nnaji, J Jung	Elsevier	65
51	2021	Application of big data with fintech in financial services	JB Awotunde, EA Adeniyi, RO Ogundokun...	Springer	65
52	2023	Artificial intelligence and blockchain technology for	AA Khan, AA Laghari, M	Elsevier	64

		secure smart grid and power distribution Automation: A State-of-the-Art Review	Rashid, H Li, AR Javed...		
53	2020	Automation of accounting processes: impact of artificial intelligence	VN Chukwuani, MA Egiyi	eprints.gouni.edu.ng	60
54	2021	Artificial intelligence in Africa: Challenges and opportunities	EO Arakpogun, Z Elsahn, F Olan, F Elsahn	Springer	60
55	2019	Artificial intelligence: Opportunities, issues and applications in accounting and auditing in Nigeria	EG Ukpong, II Udoh, IT Essien	academia.edu	59
56	2021	Agriculture 4.0: an implementation framework for food security attainment in Nigeria's post-Covid-19 era	SO Oruma, S Misra, L Fernandez-Sanz	ieeexplore.ieee.org	59
57	2022	The use of artificial intelligence and audit quality: An analysis from the perspectives of external auditors in the UAE	NA Noordin, K Hussainey, AF Hayek	mdpi.com	58
	2021	Artificial intelligence for coronavirus outbreak	SJ Fong, N Dey, J Chaki	Springer	58
58	2024	Theoretical approaches to AI in supply chain optimization: Pathways to efficiency and resilience	EA Abaku, TE Edunjobi...	pdfs.semanticscholar.org	57
59	2023	Artificial intelligence in developing countries: The impact of generative artificial intelligence (AI) technologies for development	NR Mannuru, S Shahriar, ZA Teel...	journals.sagepub.com	56
60	2021	The role of artificial intelligence in promoting financial inclusion in developing countries	N Kshetri	Taylor & Francis	56
61	2023	Review of strategic alignment: Accounting and cybersecurity for data confidentiality and financial security	TO Abrahams, SK Ewuga, S Kaggwa...	wjarr.com	56
62	2019	Artificial Intelligence-a promising anti-corruption tool in development settings	P Aarvik	beta.u4.no	52

63	2021	Adopting automated whitelist approach for detecting phishing attacks	NA Azeez, S Misra, IA Margaret, L Fernandez-Sanz	Elsevier	52
64	2022	Financial risk management and explainable, trustworthy, responsible AI	S Fritz-Morgenthal, B Hein...	frontiersin.org	52
65	2020	Artificial Intelligence in Developing Countries.	N Kshetri	libres.uncg.edu	51
66	2022	Machine learning-based regression framework to predict health insurance premiums	K Kaushik, A Bhardwaj, AD Dwivedi...	mdpi.com	51
67	2022	Artificial intelligence and machine learning in public healthcare: Opportunities and societal impact	KC Santosh, L Gaur	books.google.com	50

The result reveals that, out of 67 article with 50 and above citations article published in 2016 title “How the Machine Thinks: Understanding Opacity in Machine Learning” by Bermejo, et al., (2016) recorded highest citation of 2707 which qualified them as the lead authors in the study area followed by an article title “Comprehensive Review of Artificial Neural Network Application” in 2019 recorded 532 citations followed by the year 2020 article title “Industry 4.0 in Finance: The Impact of Artificial Intelligence” with the total number of 435 citation.

iii. Leading Authors in AI adoption

In order to answer research question four on the level of authors’ collaboration and keyword co-occurrence in the area of AI Adoption using VOSview for the period 2016-2024. The result of the analysis groups the authors in to three clusters. Cluster one and two has total number of 5 authors each while cluster three have 3 authors giving the total number of 13 lead authors in the AI studies base on total collaboration and link strength of 42 respectively (see Fig. 5). The first cluster present fraud detection, machine learning, effect on banking sector in which fraud detection has the highest number of occurrence contained five authors, cluster two 5 authors’ and cluster three 3 authors. The major authors’ Mhlongo, Odeyemi and Odeyemi with total link strength of 13, 11 and 11 respectively

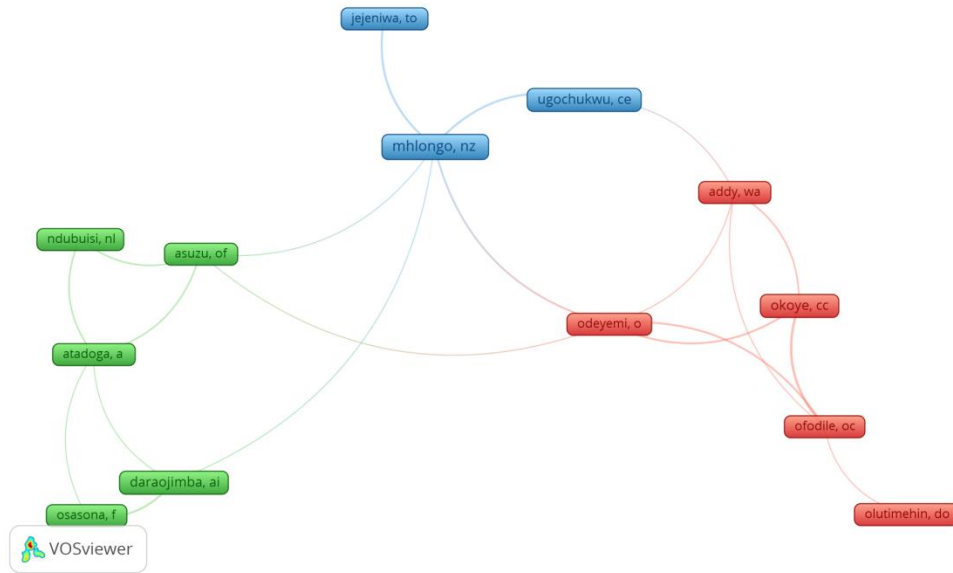


Fig. 5 Screenshot of bibliometric map created base on co-authorships (VOSviewer output)

iv. Keyword Co-Occurrence

The analysis of authors keyword co-occurrence conducted with Vosviewer using search strings in title of the studies (“allintitle AI adoption”) in google scholar search engine selecting the words that occurred 10 times and above on Title of the article turns the total number of 2,038 terms in which terms that have minimum occurrence of 10 were consider in which 46 terms meet the threshold.

The authors’ keyword co-occurrence is presented in four clusters containing 18 terms which each of the term appear more than ten times. Cluster three has the total link strength of 84 with word “CHALLENGE” having highest occurrence of 53 followed by “ADOPTION”, “FROUD DETECTION” and “DETECTION” with 43, 32 and 28, respectively, signifies the limited studies study in AI adoption in Froud detections the area and need for more studies. (see Fig:6) below:

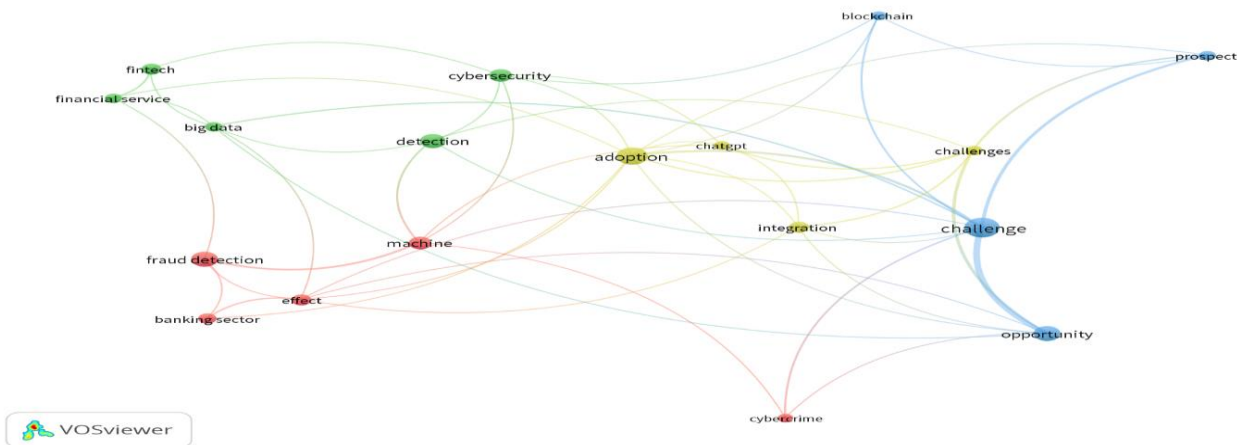


Fig. 6 Screenshot of Bibliometric Map Created Base on Keyword Co-Occurrence (Vosviewer Output).

5.0 Conclusion and Recommendations

Artificial intelligence refers to the technology capable of performing complex tasks which has the potential of exceeding human capabilities. Recently AI has become the major drivers of industrial development through integration and promoting the emerging technology (Goodell et al., 2021). AI is the transformative leap to the industries in managing risk and leveraging enormous data set through the power of algorithms process in real-time.

This study analyzes and presents the development of scholarly article on AI adoption in organizational functions from 2016-2024 using Google Scholar data base. The study reveal that AI is an emerging area with limited number of studies in across the globe and Nigeria in specific. It further reveals the strong collaboration among the researchers across the globe in AI adoption in decision making area that need to be explored. Similarly, several keywords were identified base on occurrences in the literature which has the potential of guiding the future researcher as to the direction of the study area. Furthermore, the study discovered these articles were written on more than 20 different organizational functions for improve efficiency and effectiveness. This study further suggests for more studies on AI to uncover more human capabilities that could be perform by AI. Similarly, researches are needed for development of ethical framework for AI integration in both private and public sector organizations.

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