Artificial Intelligence Integration in Global Social Science Research: A Metric Analysis

Presented by
Borna Nath,
Moirangthem Sajan Singh,
Dr. Rajesh Rangappa Aldarthi
Prof. Manoj Kumar Sinha ,

Outline

- **Introduction**
- **Literature Review**
- **Research Objectives**
- **Research Methodology**
- **Data analysis**
- **Major findings**
- **Limitation**
- **Conclusion**

Introduction

- Artificial Intelligence (AI) refers to the simulation of human intelligence by machines (Mehak Kumar & Mehta, 2023).

- AI mimics human activities such as speech recognition, image recognition, and natural language processing (Xiumei Mo, 2023).

- AI performs tasks like visual perception, speech recognition, decision-making, and language translation, demonstrating intelligence comparable to humans and animals (Singh & Haju, 2022).

Introduction cont..

Impact on Various Fields

- AI is revolutionizing several industries by automating tasks that formerly required human intelligence, leading to optimal and efficient decision-making processes.

- AI collects, processes, and learns from data to effectively conduct automated tasks, impacting daily life through applications like autopilot technology, chatbots, and digital assistants.

- AI is a multifaceted field that enables machines to mimic human cognitive functions and perform tasks beyond human capabilities.

AI in Academic Research

AI and Social Data Analysis

- AI improves the accuracy of social data analysis by addressing challenges such as bias, completeness, and feature selection (Oreški, 2023; Menke et al., 2023).

- AI helps address societal issues, but it also poses risks like bias. Strategies and behavioral models can reduce harm while promoting positive outcomes (Morini, 2023).
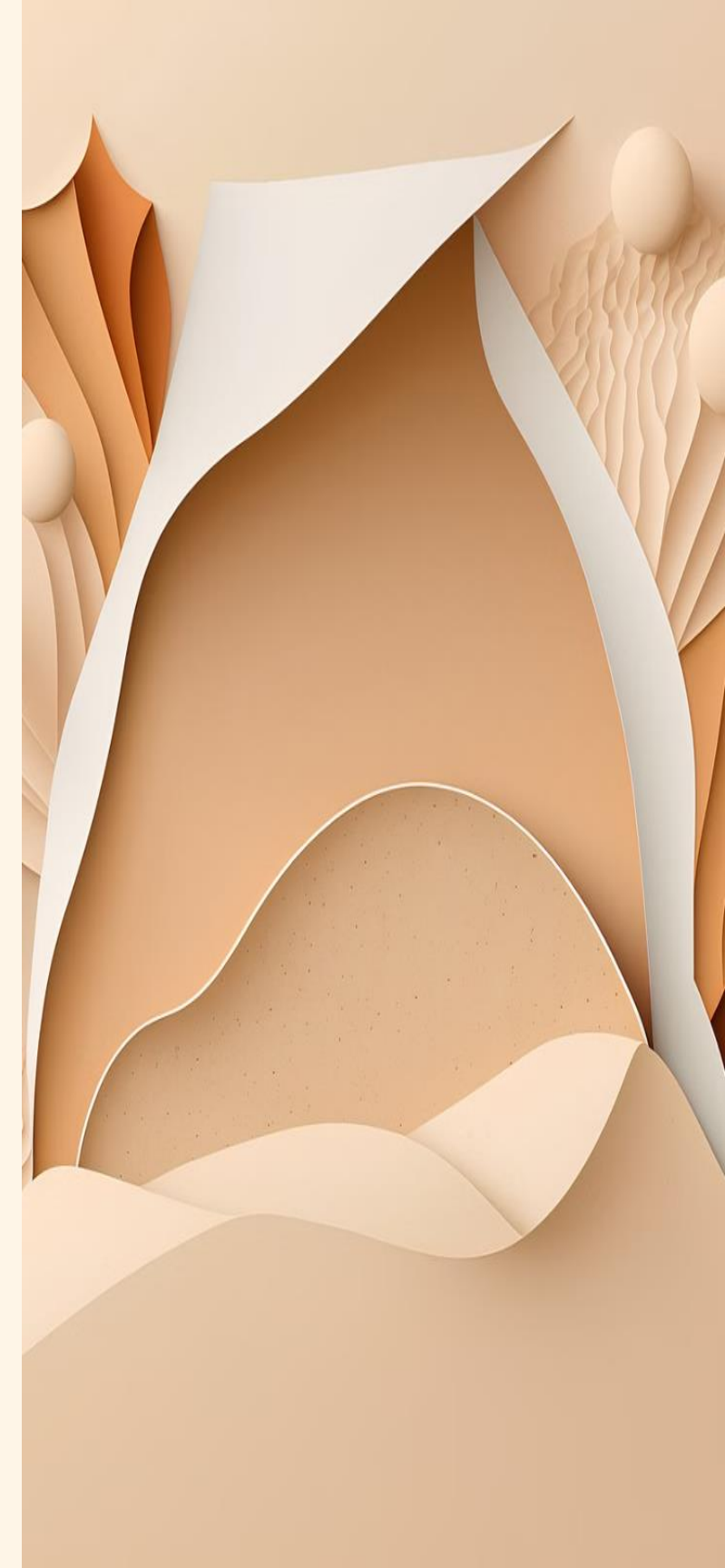
Introduction cont..

Benefits of AI in Society

- AI enhances customer service, contentment, and efficiency in electronic transactions, and improves community services (Bakhodirovich et al., 2022).

Challenges of AI

- Despite benefits, AI brings challenges like unemployment and a lack of job opportunities in certain sectors.

Literature Review

Literature Review

- Artificial Intelligence (AI) is rapidly expanding worldwide, impacting both everyday life and specialized fields like clinical research (Pollock et al., 2024). Technologies such as machine learning, deep learning, robotics, and natural language processing hold immense potential for innovation across sectors. AI is also transforming creative fields like art, literature, and music, while raising concerns about its societal and environmental impacts (Lipska, 2024). In the social sciences, AI improves decision-making and extracts insights from large datasets, benefiting areas like economics and education (Di Franco & Santurro, 2023; Bhagat & Singh, 2022} However, ethical concerns such as employment displacement must be addressed to ensure balanced and responsible AI progress (Duan, 2024; Wahab, 2024).

Research Objectives

- To analyze the growth patterns of artificial intelligence (AI) research across various disciplines to understand the evolution of AI integration in the context of global research.
- To determine the position of India among the top ten countries for futuristic study.
- To categorize the published documents by format on the influence of AI on social science research in India.
- To analyze the patterns of growth to understand how social science research in India has changed in terms of AI integration.

Research Objective cont..

- To examine new trends and research priorities within social science research.

- To examine the top Indian affiliations according to article publishing during the study period.

- To analyze the citation impact based on collaborative strength and number of documents.

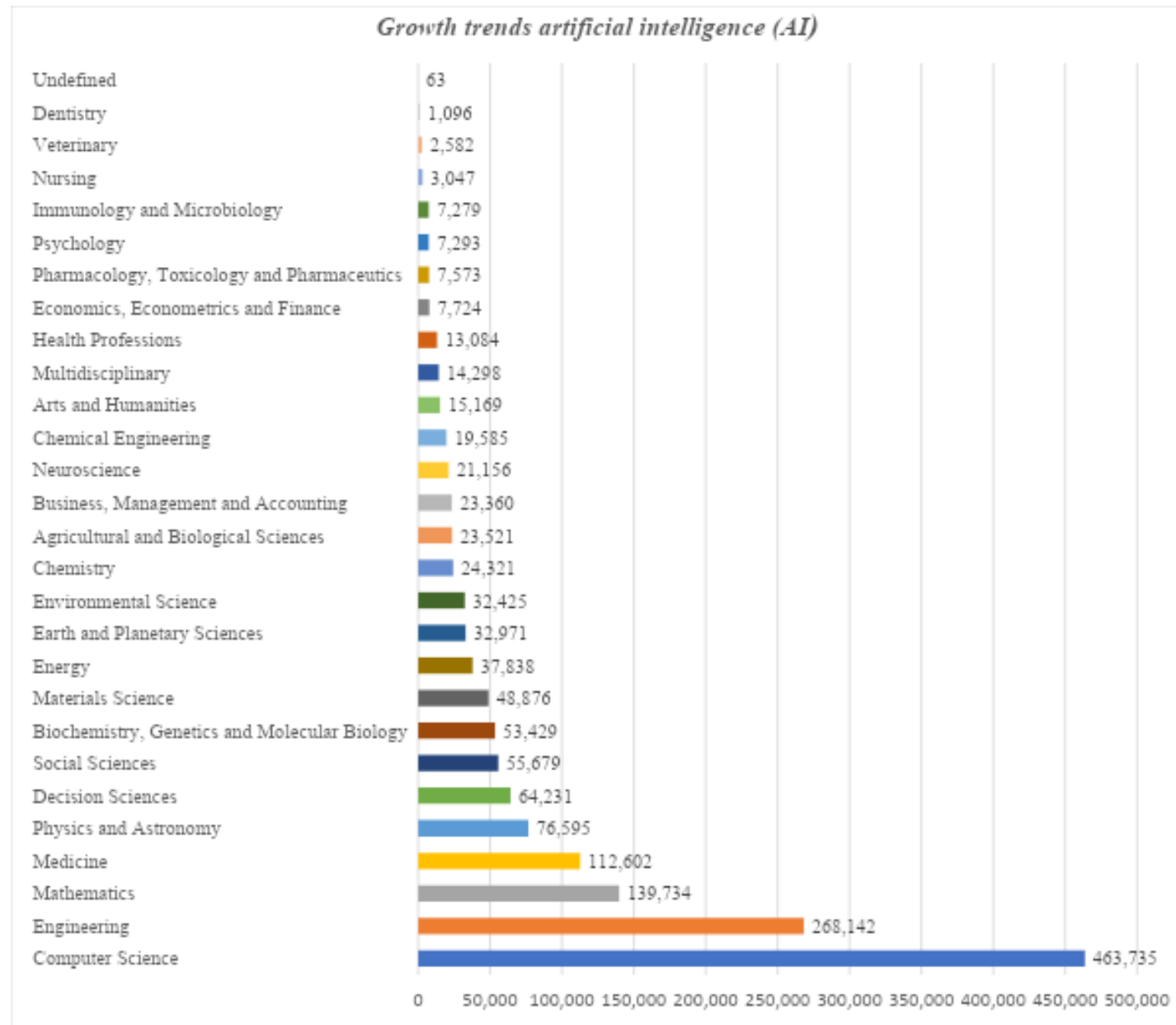- To map out the collaboration network among social science researchers.

Methodology

- Analysis has been done by VosViewer software.

SEARCH STEPS	TOTAL FOUND	FILTER
Start Search		
Search for Articles		
Query: (Artificial Intelligence OR AI OR Machine Learning OR Deep Learning OR Natural Language Processing OR NLP) AND (research OR study OR application OR experiment)	9,94,061 on 19, April, 2024	
Limit by Year: (PUBYEAR > 2013 AND PUBYEAR < 2024)	7,75,930	YEAR RANG
Limit by Subject Area: (SOCI)	55,679	SUBJECT AREA
Limit by Affiliation: (India)	4,856	AFFILCOUNTRY
Limit by Document Type: (Article)	2,040	DOCTYPE (ar)
Limit by Source Type: (Journal)	2,036	SRCTYPE (j)
End Search		

Data analysis

Growth trends of artificial intelligence (AI) research across various disciplines

Growth trends artificial intelligence (AI)

- Scopus database analysis for the years 2014 to 2023.

- Computer Science leading at 463,735 documents.

- Social sciences with 55,679 has been consider for further analysis

Leading countries and position of India among top 10 leading countries

Leading countries
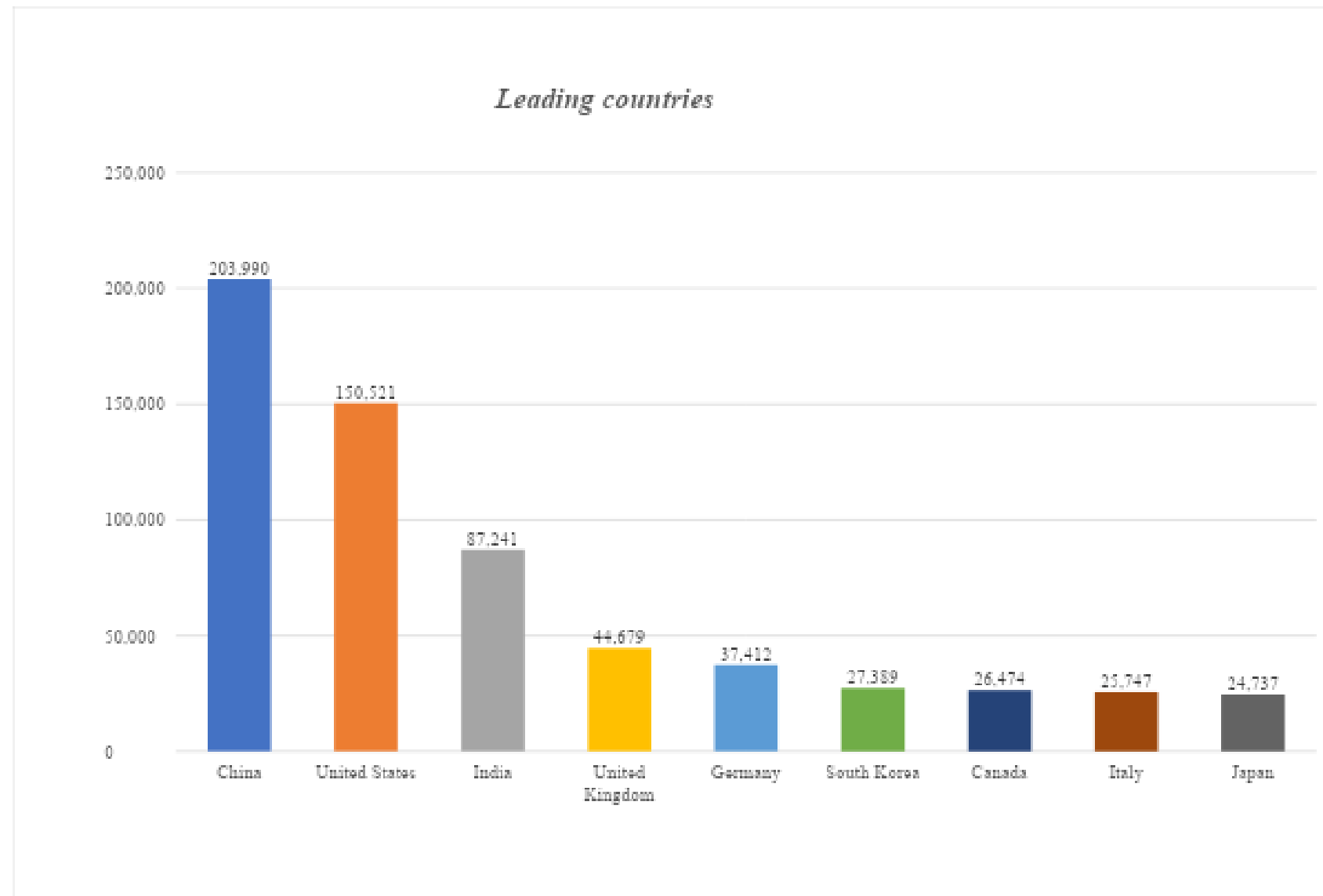
- China is the leading producer of research documents (203,990),
- followed by the US (150,521) and
- *India* (87,241), according to Scopus data from 2014 to 2023.
- Next India is consider for further analysis with 87,241 data.

Types of documents based on AI influencing social science research in India

AI influencing social science research in India, based on document type

- Conference Paper
- Article
- Book Chapter
- Review
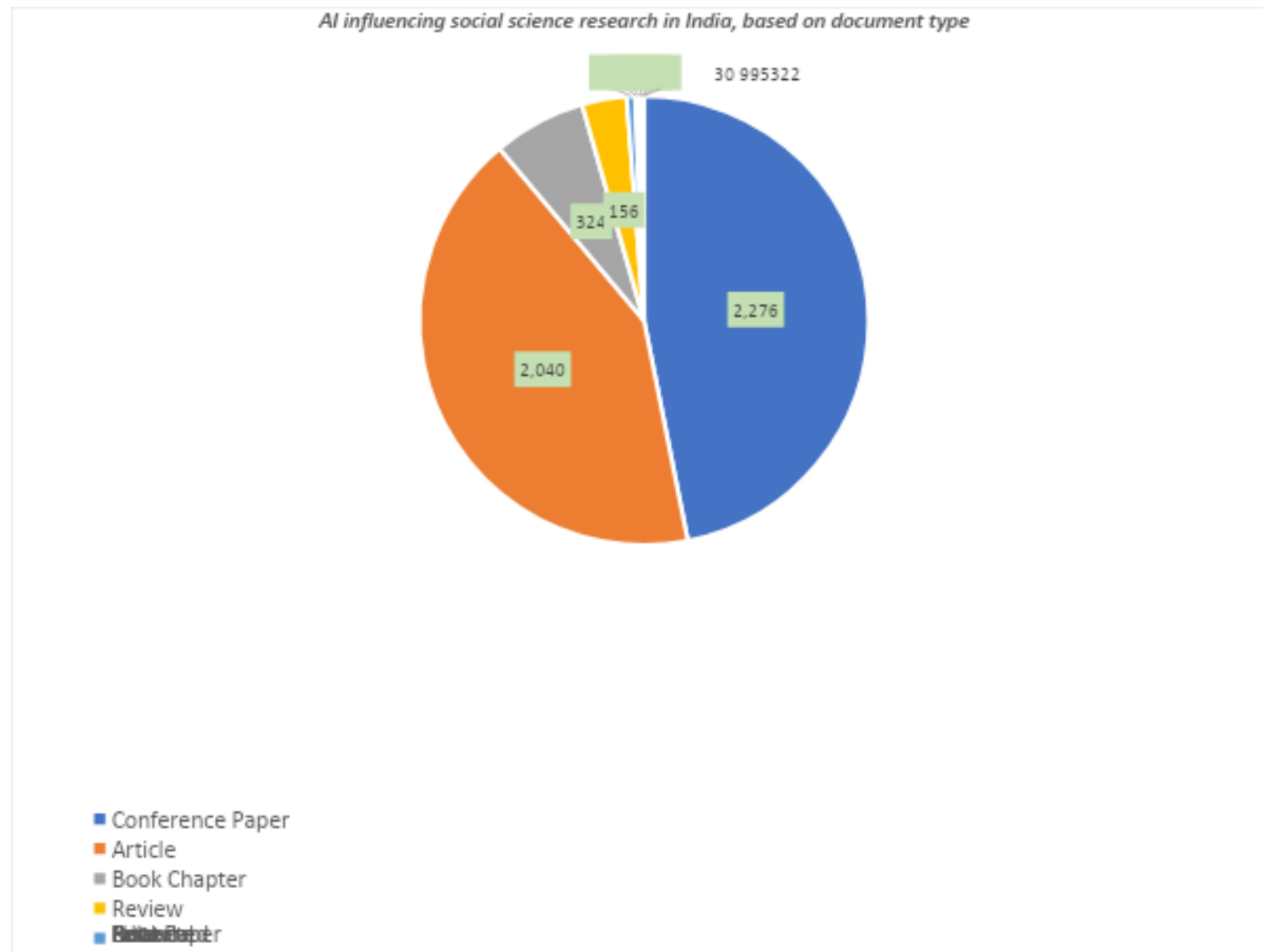
- Conference papers (2040) and articles (2276) are the most common formats for sharing knowledge, highlighting their importance in academic communication.

- Next articles, with **2276** are consider for further analysis.

Growth trends of artificial intelligence (AI) research across various time frames

Growth trends of Artificial intelligence: time frames
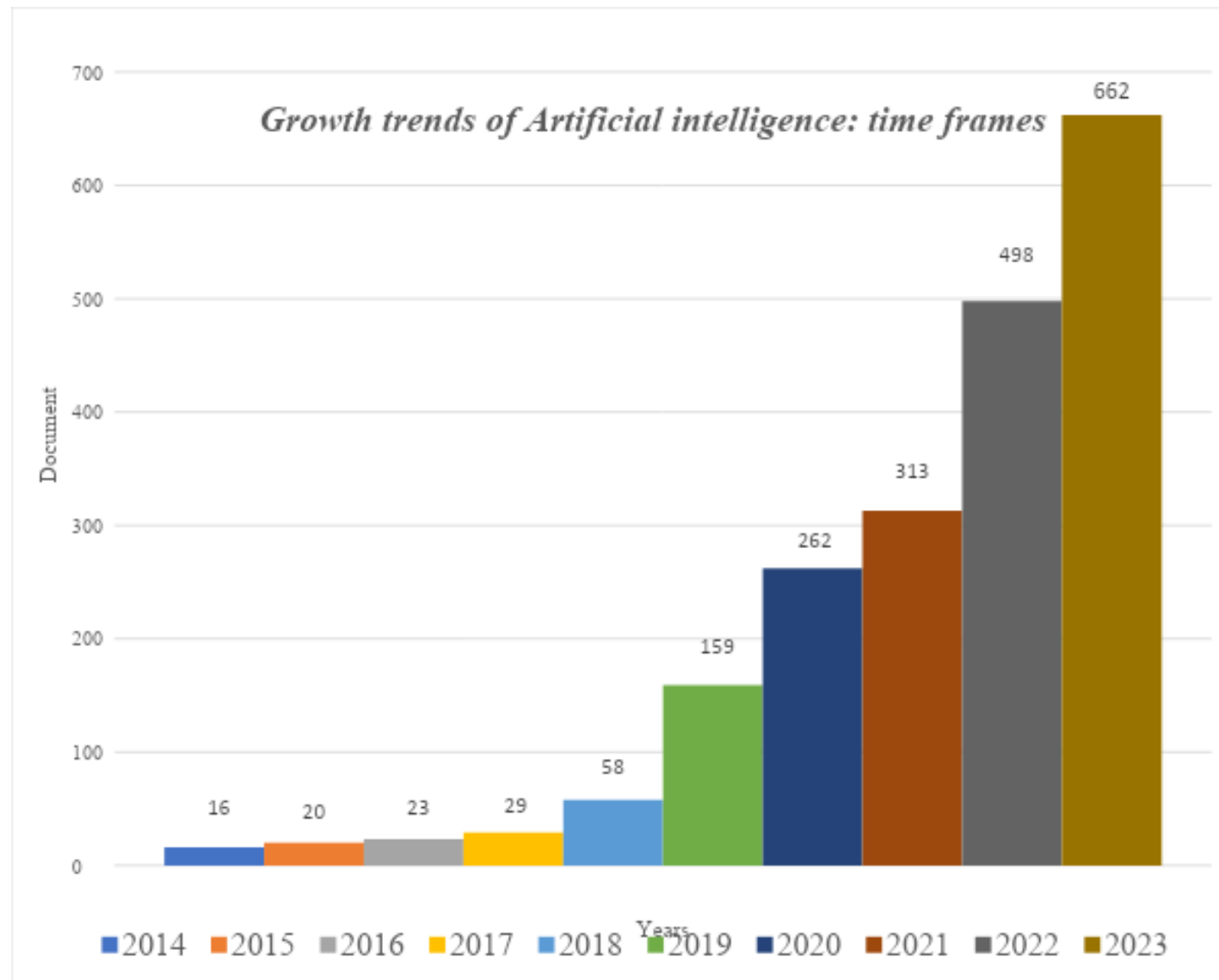
- The number of published documents over time, with 16 in 2014 rising to 662 in 2023.

- This substantial increase implies that interest and investment in the field covered by the documents are increasing.

- The largest increases are observed in the most recent years, particularly from 2018 onward.

Publication from top 10 journals

Number of Articles publication from top 10 journals
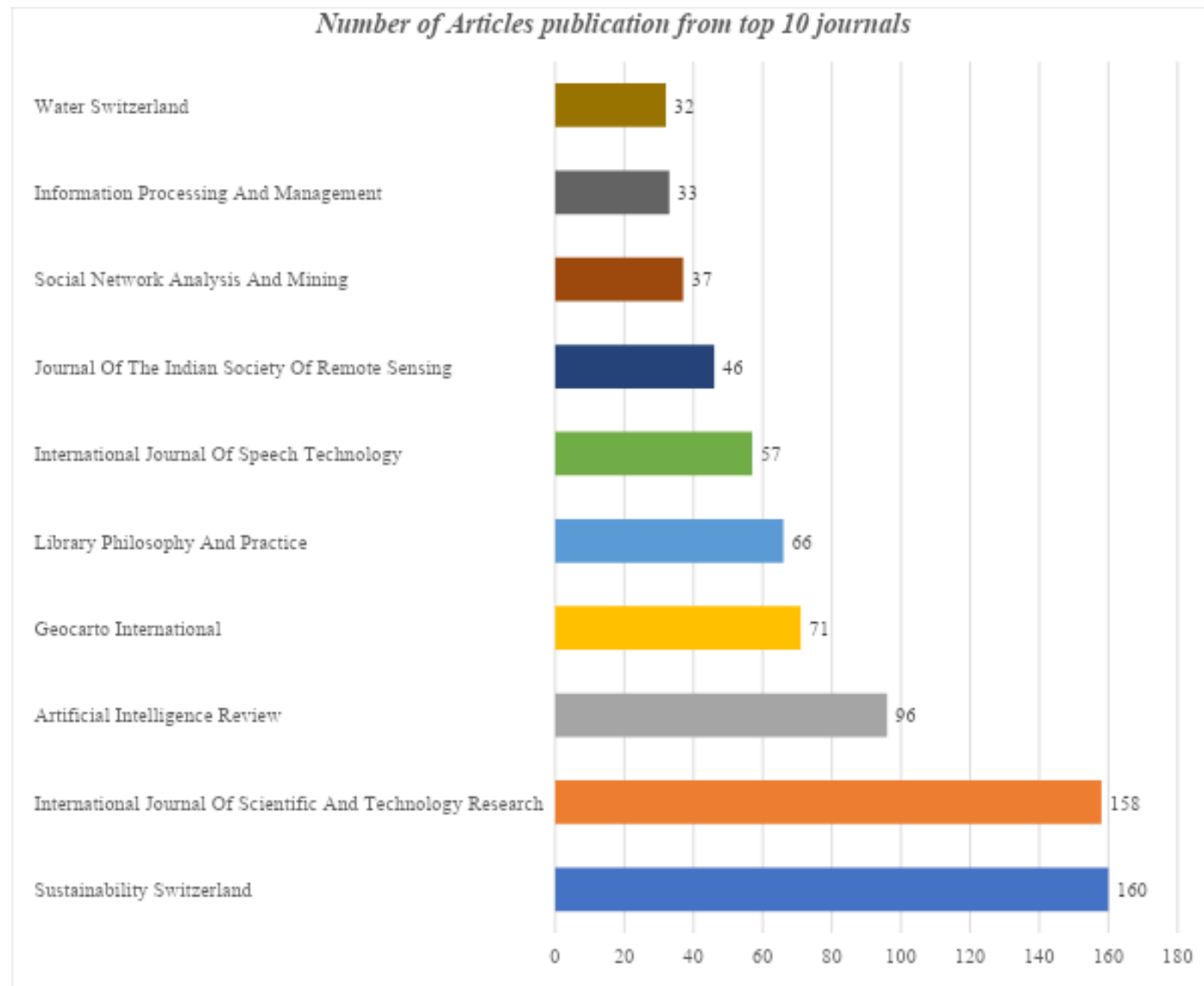
- "Sustainability Switzerland" and "International Journal of Scientific and Technology Research" followed by "Artificial Intelligence Review" lead the way in covering sustainability and multidisciplinary technology among the top 10 journals.

Top affiliations in India based on article publications between 2014 and 2023

Top affiliations in India based on article publications
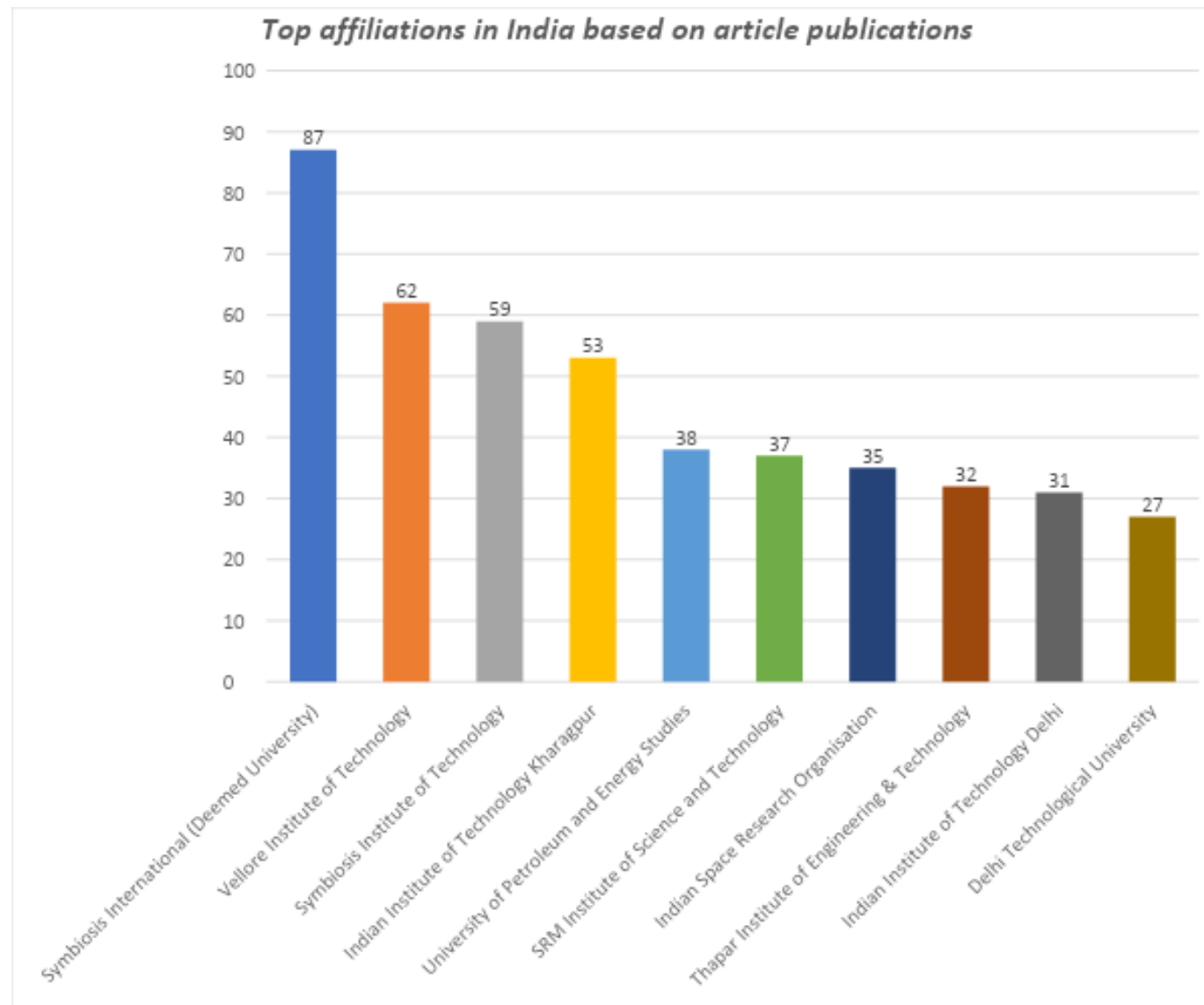
- The largest number of publications is **87 from "Symbiosis International (Deemed University)"**, followed by 62 from "Vellore Institute of Technology" and 59 from "Symbiosis Institute of Technology". Prominent establishments such as the "Indian Space Research Organization," "Indian Institute of Technology Delhi," and "Indian Institute of Technology Kharagpur" are also included.

Citation impact based on collaborative strength and number of documents.

Citation Impact
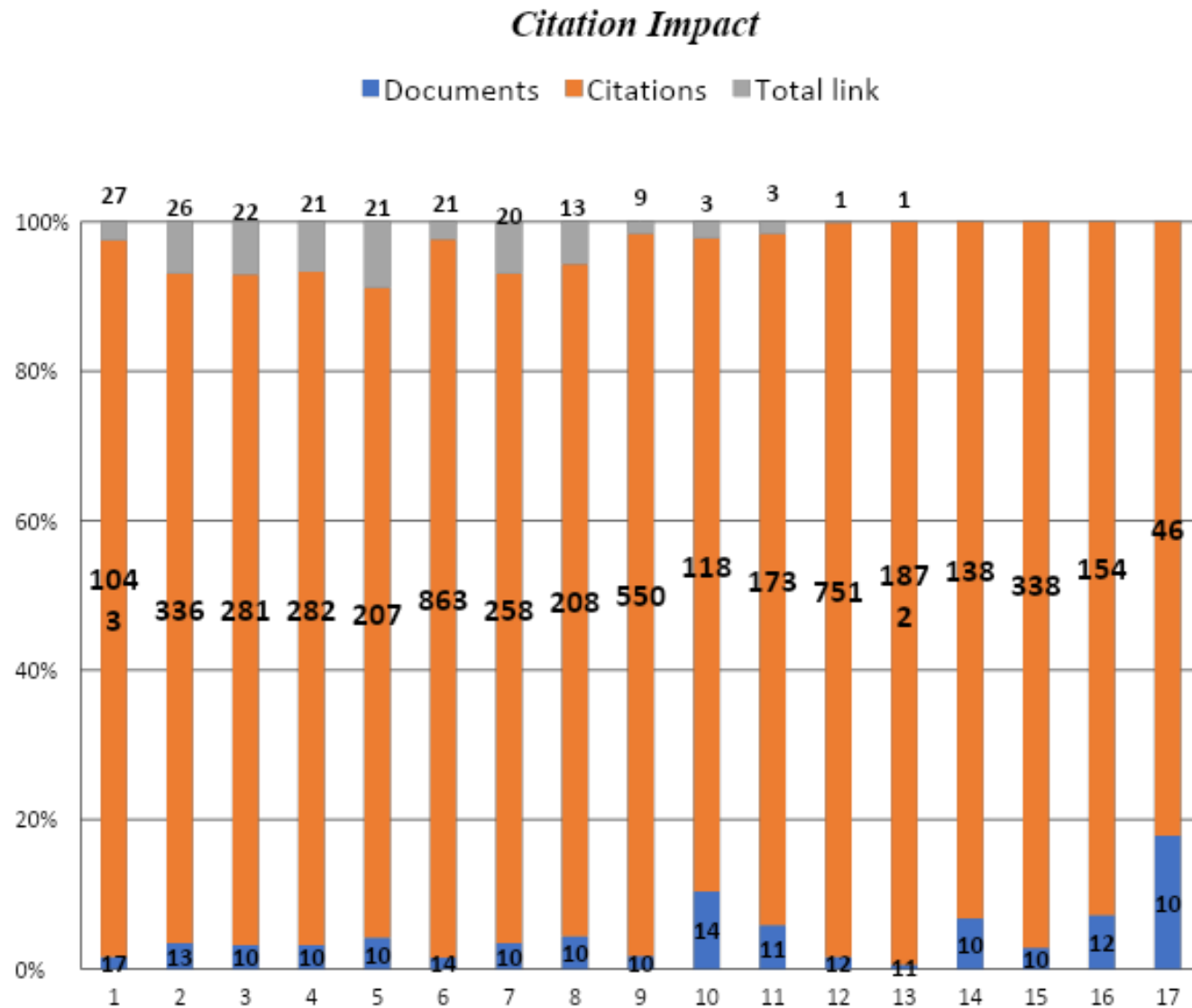
AUTHOR	DOCUMENTS	CITATIONS	TOTAL LINK/ COLLA BORATION
Pham, Binh thai	17	1043	27
Saha, Asish	13	336	26
Arabameri, Alireza	10	281	22
Chakrabortty, Rabin	10	282	21
Costache, Romulus	10	207	21
Prakash, Indra	14	863	21
Chowdhuri, indrajit	10	258	20
Pham, Quoc bao	10	208	13
Al-Ansari, Nadhir	10	550	9
Kotecha, Ketan	14	118	3
Kumar, Satish	11	173	3
Chatterjee, Sheshadri	12	751	1
Dwivedi, Yogesh K.	11	1872	1
Kumar, Anil	10	138	0
Kumar, Neeraj	10	338	0
Talukdar, Swapan	12	154	0
Verma, Manoj Kumar	10	46	0

Citation impact based on collaborative strength and number of documents

- Table-2 and Figure-7 present the scholarly output and influence of authors, including publication count, citation impact, and collaborative links. Prominent authors like Yogesh K. Dwivedi and Binh Thai Pham have high citation counts, indicating significant research influence. Collaboration varies, with authors like Asish Saha and Binh Thai Pham showing strong linkages, while Anil Kumar and Neeraj Kumar exhibit fewer collaborations. Notable authors with high total strengths include Pham (17 publications) and Prakash, Indra (14 publications). Pham also has the highest collaboration count (27), followed by Saha (26).

Collaboration networks between social science researchers
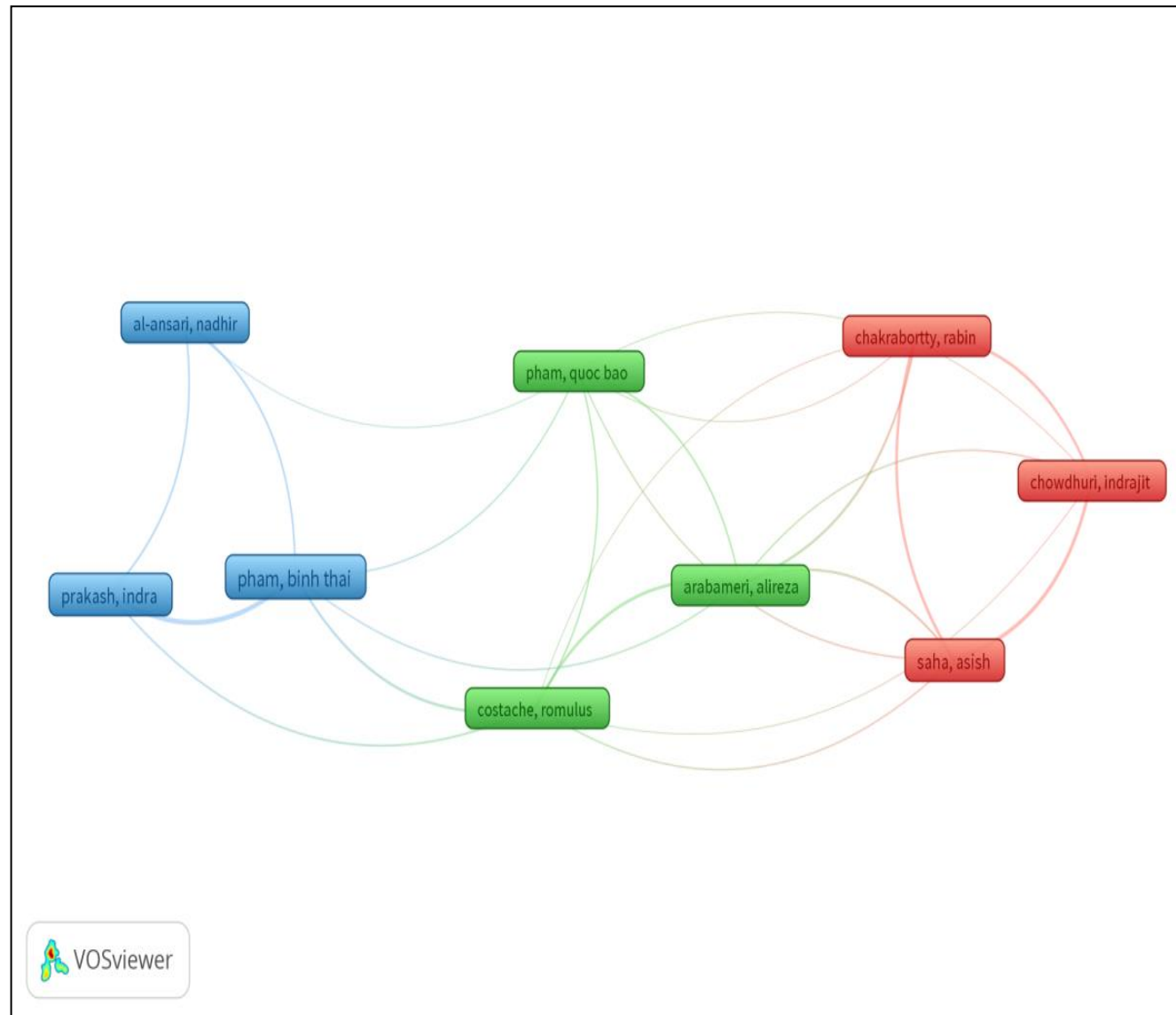
- Nine authors out of 6208 fulfill the condition of collaborating on at least ten documents and having at least ten citations. Three clusters have been identified from the collaboration patterns of these nine authors. As..

Collaboration networks between social science researchers. Cont..

- In Cluster 1, Saha, Asish; Chowdhuri, Indrajit; and Chakrabortty, Rabin work together.

- In Cluster 2, Costache, Romulus; Pham, Quoc Bao; and Arabameri, Alireza work together. Another cooperative group

- In Cluster 3 is made up of Pham, Binh Thai; Prakash, Indra; and Al-Ansari, Nadhir. This classification helps standardize the analysis and understanding of collaboration networks among these authors

Major findings Cont..

- The field of computer science has the most documents (463,735), mathematics, and medicine.

- The social sciences, containing fewer papers (55,679), have a considerable impact on policy and societal issues.

- China creates the most research documents, with 203,990, followed by the United States (150,521) and India (87,241).

- India's academic production ranks among the top research nations. Conference papers and publications are the most preferred formats, demonstrating their relevance in knowledge dissemination

Major findings. Cont..

- Articles, particularly on AI and social sciences, are essential for obtaining precise study results.

- The number of published documents has steadily increased from 16 in 2014 to 662 in 2023, demonstrating expanding interest and developments. The largest increases happened after 2018.

- The best-known publications include "Sustainability Switzerland," "International Journal of Scientific and Technology Research," and "Artificial Intelligence Review."

Major findings

- Prominent Indian institutions include "Symbiosis International (Deemed University)" and "Vellore Institute of Technology."

- Notable writers such as Yogesh K. Dwivedi and Binh Thai Pham have a high citation count, suggesting substantial effect.

- Collaboration patterns differ across author with 3 clusters, with some actively cooperating in research.

- Total strength, which includes citations and publications, demonstrates total influence with nine authors matching the criterion for considerable collaboration and citation.

Limitation

- Firstly, when studying trends in AI progress across disciplines, it is crucial to look at how AI techniques are being integrated into less traditional social science fields such as anthropology and social work, where full application and understanding may be lacking. Secondly, identifying specific fields where India could fall short or flourish might reveal flaws in the country's status as an AI research leader. A comparative analysis of AI deployment strategies or instructional approaches in India and other leading countries might be useful for future study.

Limitation Cont..

- Furthermore, examining how alternative AI-based document formats influence research in social sciences may show anomalies in how these studies are used and conducted. Discovering weak or understudied relationships among researchers during cooperation network mapping might help to focus efforts on improving the strength and effect of collaborative activities. Filling these gaps may have a significant influence on how AI is understood and implemented in worldwide social science research.

Conclusion

- AI is transforming numerous sectors by assisting with activities that used to need human intelligence. This study shows how AI research has expanded globally, particularly in computer science, engineering, and the social sciences. India is an important contributor, demonstrating a good research presence. The study focuses on key publications, esteemed universities, and researcher cooperation. With rapid development, it is necessary to address ethical challenges and collaboration across disciplines. To maximize the value of AI research, we should further worldwide collaborations, support research institutes, and disseminate discoveries broadly. This will help AI research progress and benefit society.