3. Integrating Artificial Intelligence with Indian Knowledge Systems: A Bibliometric Study on Sustainable Management Practices

Khirod Chandra Maharana
Assistant Professor, School of Commerce, Gangadhar Meher University, Odisha, India
Email: khirod82@gmail.com
Binod Kumar
Associate Professor, Faculty of CSE & IT, Jharkhand Rai University, Ranchi, Jharkhand, India
Email: bit.binod15@gmail.com
Shivani Guru
Assistant Professor, Department of Management, Amity University, Raipur, Chhattisgarh, India,
Email: shibani_mba@yahoo.com
, Pravin Kumar
Assistant Professor, Department of Management, Brainware University, Kolkata, BW
Email: pravinon.email@gmail.com
Srikant Upadhyay
Associate Professor, Department of Electronics and Communication Engineering, MLR Institute
of Technology, Hyderabad, Email: shri.kant.yay@gmail.*com*

Abstract

The combination of AI and IKS opens a new dimension altogether for enhancing the practice of sustainable management. To achieve this objective, this paper adopts a bibliometric analysis to understand the convergence of these domains in responding to modern sustainable development dilemmas. With bibliometric data obtained from prominent academic databases, we explore directions, patterns, and significant works which advance AI, IKS, and sustainable management. This analysis shows the recent interest in using AI to improve traditional Indian perspectives to provide sustainable solutions such as resource management, agriculture, and ecology. Further, this study establishes and analyses areas of AI-driven innovation and IKS that can complement each other towards sustainability development. The study highlights key directions in the need to embrace a multidisciplinary approach in analyzing growth and development strategies and puts forward future research suggestions taken from merging the best of East and West with innovation in adopting new technologies.

Keywords: Indian Knowledge Systems, Information Technology (IT), Artificial Intelligence (AI), Sustainable Business Management
JEL Codes: M14, O33, Q01, L26, M15

1. Introduction

More recently, global campaigns for sustainability have disclosed how it is possible no longer to advance mere solutions from the conventional bodies of knowledge without considering holistic approaches that incorporate the advanced iPhones. Indian Knowledge Systems (IKS) based on traditional knowledge of several centuries are rich sources of information in sustainable practices with special reference to agriculture, natural and local resource management and environmental conservation. Therefore, Artificial Intelligence (AI) has become one factor that has revolutionized sustainability challenges by enabling tools for resource allocation, predicting environmental changes, and decision-making (Rajoura & Rajoura, 2022). This is the case with IKS and AI even though they both hold a lot of promise in facilitating sustainable innovation. The partnership between AI and IKS can help develop new and unique ways of achieving sustainability by putting creativity and advanced logical thinking collected by algorithms with the practicality of local knowledge passed from generation to generation. With the use of AI, new methods of using IKS in the current society can be developed to increase the existing practices. Therefore, this paper seeks to fill this research gap through a bibliometric analysis of the current literature on IKS, AI and sustainable management convergence. Its purpose is to identify common patterns, influences and thematic niches representing the increasing public interest in these intersecting fields. Through assessing the different research publications, we want to learn how AI may be used to advance sustainable management practices embracing IKS while pointing out the directions to other research that can further advance the use of AI for sustainable development. Because Bibliometrics is a quantitative and organized working method it can be interesting to map the intellectual roots and the most cited publications of a certain research area (Maharana & Acharya, 2024). This paper also provides a guide for scholars and practitioners who wish to study the liberatory possibilities of AI and IKS in supporting the sustenance of the environment. The bibliometric analysis method to be employed in this manuscript is outlined in the subsequent sections, followed by an overview of findings and trends in the literature; an agenda for future research into AI and IKS for sustainable management is also advanced.

2. Review of Literature

IKS and IT are coming into the center of focus gradually over the past few years majorly in the organization management and sustainability field. Drawing from the literature, this paper reviews research concerning integrating traditional knowledge systems with modern technological instruments, wherein the role and importance of IKS towards developing ethical IT processes and decisions, as well as resourcefulness and sustainable organizational or business models. (Sharma, 2024) opine that knowledge systems in the context of business and management education including traditional frameworks are key to addressing global issues such as sustainability. The authors discuss how incorporating first-hand experience together with developing sophisticated applications such as IT produces

far more robust and sustainable systems, especially in developing countries such as India. The paper concluded with a call to the highly integrated and cross-discipline method for traditional knowledge systems and modern IT solutions to get their best. In the same way, in their systematic review of knowledge management practices, (Gaviria-Marin et al., 2019) centre their analysis on how IT is incorporated into organizational knowledge. They argue that knowledge management is not only a question of implementing technology but also of integrating such concepts as IKS that embrace cultural methods of reasoning and are grounded in ethical values and sustainability. The study recognizes IT as the enabling factor towards knowledge sharing and management across various organizations. Additionally, (Mishra et al., 2024) extend the literature on IT adoption in Indian organizations to demonstrate how knowledge systems can complement IT systems for improving decision-making and organizational performance. Thus, they introduce the idea that including indigenous knowledge in IT models can enhance rural entrepreneurs and create a better approach to different business practices. Using Indian supply chains as a case, (Banerjee, 2022) discussed the use of blockchain technology and other forms of advanced technologies in supply chain management, creating the argument for a harmony between modern digitization and IKS. These studies demonstrate the importance of applying IKS in existing technologies, especially in areas such as agriculture and manufacturing where the core traditional knowledge is still valuable. With relevance to sustainability, (Amani, 2024) investigates how IT can be used to support sustainable business practices within organizations based in India. The authors believe that if ITP enhances the IT processes linked to conventional sustainability activities like IKS, it will result in effective resource management for ethical business. They have given empirical support for IT capability with sustainability, where it is aligned with traditional ethics. Lastly, (Mandavkar, 2023) on the shades of IT implementation failure and success from an Indian perspective emphasize that integrating traditional knowledge systems such as IKS diminishes possible risks in the techno-organization process. According to the authors, IKS provides a practical ethical base and long-term vision that is correlated with the positive integration of IT within large organizations.

3. Research Methodology

Research Design: Therefore, this study utilizes a bibliometric analysis technique to map the existing scholarly work on the relationships between IKS, AI and sustainable management comprehensively. Bibliographic analysis is a standard methodology used in bibliographic and document research to evaluate publications and determine trends, research patterns, and understanding of a given field of academic inquiry. It entails using citation information, keywords and authors' names and affiliations from published papers to categorize papers, and discover significant works and trending research topics. Its objective is to present a state-of-the-art analysis of the current literature and valuable suggestions for the expansion of the field.

Data Collection: The data used for bibliometric analysis is obtained from Scopus, Web of Science and Google Scholar databases. These databases were selected because of the broad representation

of peer-reviewed journals, conference papers and proceedings indexed in those fields of AI, IKS, and sustainability. The following keywords were used for the search query: Therefore, the keywords that were used for search included Indian Knowledge Systems, Artificial Intelligence, Sustainable Management, Sustainability, and Bibliometric Analysis along with the Boolean operators, to make sure that all the suitable publications are included in the study material. The study only focuses on publications that have been published between 2019 and 2024. This period is selected to include contemporary advances in AI for sustainable management and for the advanced scientific acceptance of traditional knowledge systems.

Limitations of the Methodology: The work presented here has certain limitations, primarily the quality and quantity of information in the databases used. There are literature reviews where important studies are not indexed in the selected databases. The results may only reflect practice in high-impact journals, disregarding other important research done and published in less prominent journals. The choice of keywords and the strings to be searched determine the range of the investigation. Some research can be rejected if they were conducted with different keywords than what was selected for the search. Nevertheless, bibliometric analysis is still a valuable technique for evaluating research patterns and for discovering areas of the literature that have been poorly addressed. The outcomes derived from this evaluation are informative to expanding the application of artificial intelligence and indigenous knowledge systems as approaches to sustainability management.

4. Result and Discussion

Table 1:   Annual Scientific Production

Year	Articles
2019	1
2020	5
2021	24
2022	24
2023	23
2024	50

Source: *Authors' Calculation*
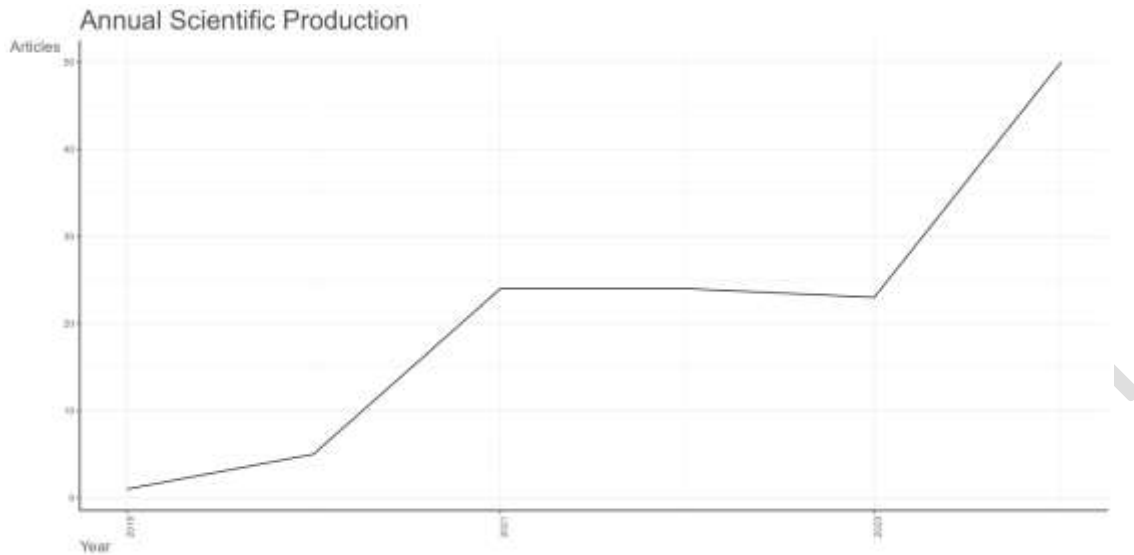
Figure 1: Annual Scientific Production

This figure perhaps shows the number of publications produced annually between 2019, 2020, 2021, 2022, 2023, and 2024. From this result, the trend analysis of the research output demonstrated that the research output has been gradually rising over the years with a sudden spurt in 2024. This trend denotes increasing scholarly works incorporating AI in Indian Knowledge Systems (IKS) and sustainable management. The drastic rise in 2024 shows that these areas are the future in addressing sustainability challenges through AI-engaged traditional knowledge systems.

Table 2: Most Relevant Authors

Authors	Articles	Articles Fractionalized
Abhay Joshi AJ	2	1.00
Arpan Kumar Kar AKK	2	0.67
Md Mohabir Alam MMA	2	0.45
Nripendra P Rana NPR	2	0.58
Ruba Priyadarshini RP	2	0.58
Sayan Das SD	2	0.45
Seema Mahlawat SM	2	0.58

Sumanjit Singh SS	2	0.31
Vimal Kumar VK	2	0.31

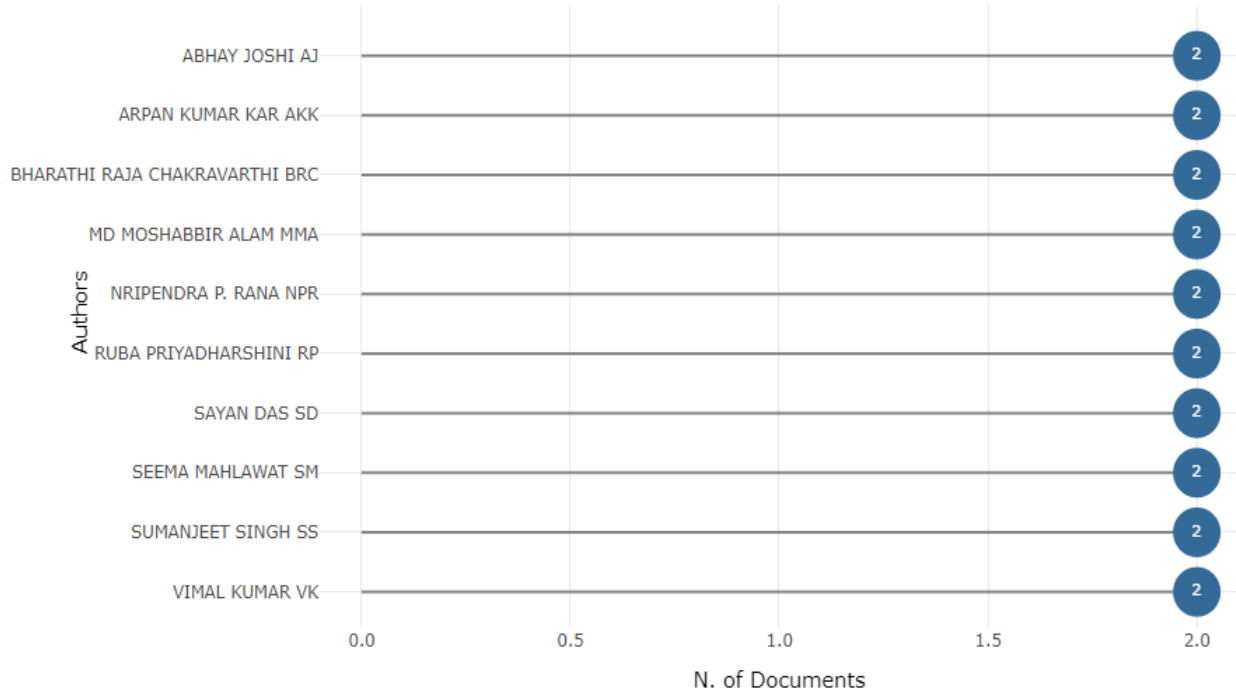**Source:** *Authors' Calculation*

Figure 2: Most Relevant Authors

This figure will represent all the authors most active in the area. Some authors such as AJ, AKK, and others have several articles on AI, IKS, and sustainability. The fractionalized data probably takes into account self-citation where authors share papers, thus giving an individual contribution. This suggests that much of the study is being focused on a selected few impressionable scholars who are shaping this field.
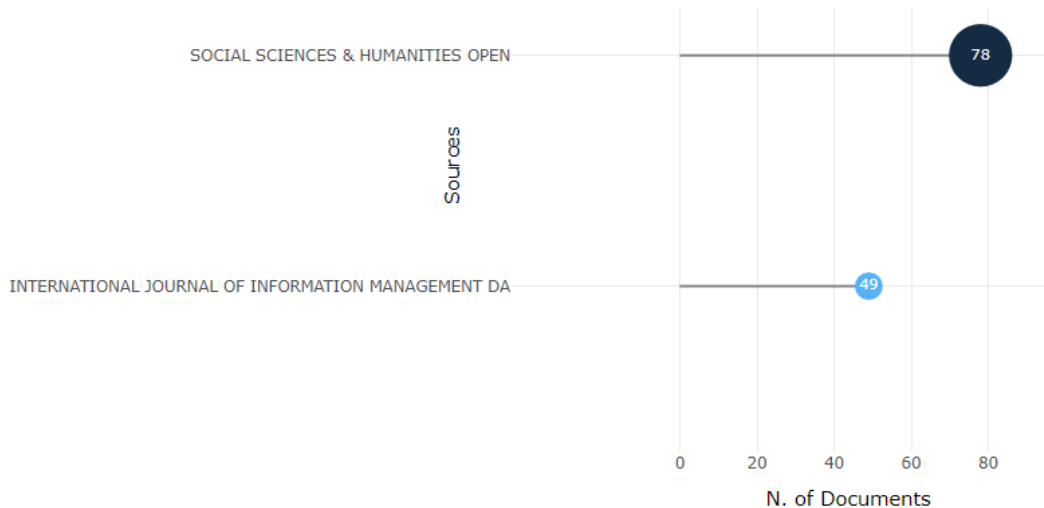
Most Relevant Sources

Figure 3: Most Relevant Sources

The publication that this figure denotes is the journal or conference that publishes most of the articles on artificial intelligence, IKS and sustainable management. This shows what the top journals are where researchers need to look for new and exciting developments in this multidisciplinary subject area. It also indicates which journals could be those that contribute to the formation of this discursive and academic practice about such topics.

Words Frequency over Time

Figure 4: Word Frequency over Time

This chart shows the level of occurrence of such terms over time as Artificial Intelligence, Sustainability, and Indian Knowledge Systems. The findings show which areas have emerged in the past few years based on the analysis of the data collected from the journals. An increase in the results concerning both sustainability and AI means that the attention to these problems in terms

The Asian Thinker
A Quarterly Bilingual Peer-Reviewed Journal for Social Sciences and Humanities
Year-7 Volume: IV (Special), October-December, 2025
Issue-28 ISSN: 2582-1296 (Online)
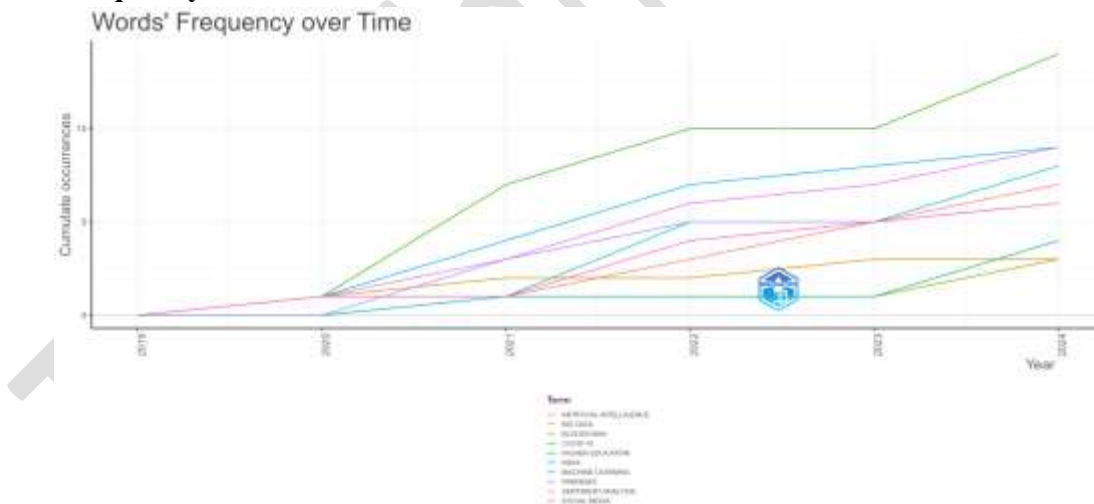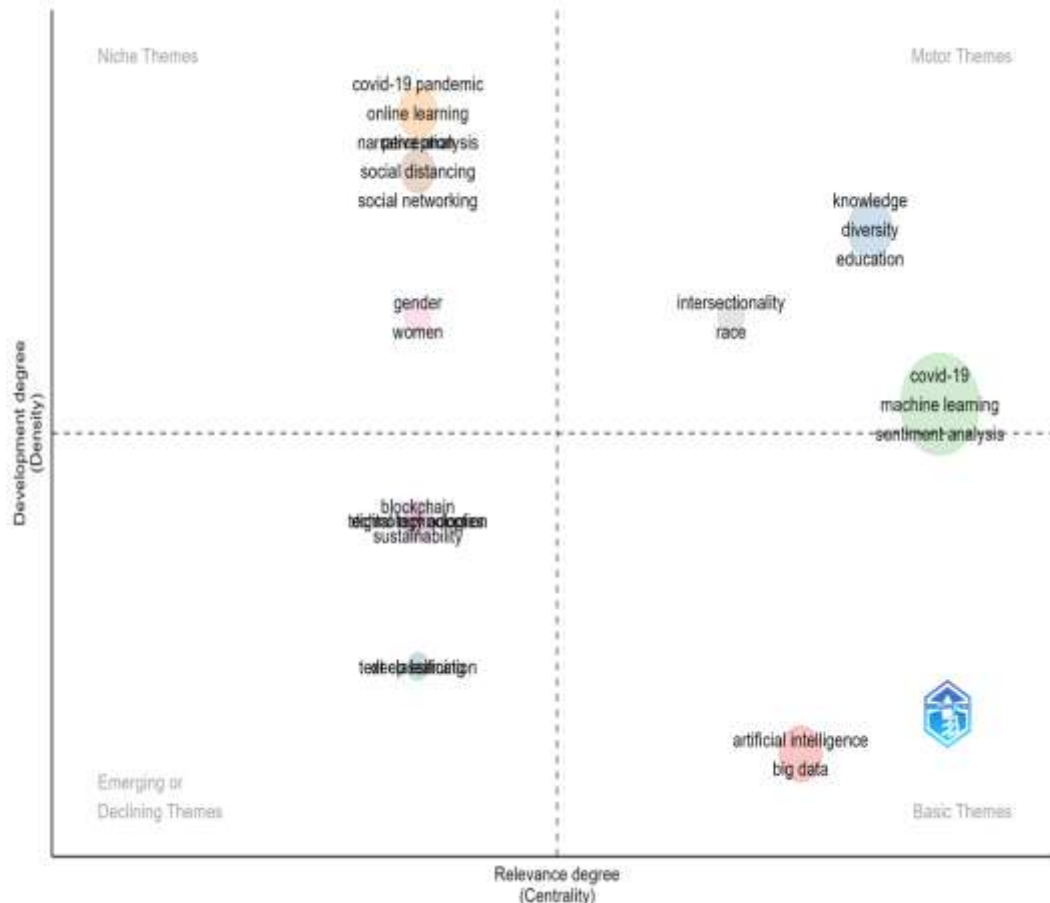**Website:** www.theasianthinker.com   **Email**: asianthinkerjournal@gmail.com

of literature increases, which means that the importance of the incorporation of technological solutions for SDGs grows.

Thematic Map

Figure 5: Thematic Map

On using a thematic map, one can identify numerous themes about a given area, and learn how all the various themes are affiliated. Here, it most probably outlines primary concepts like sustaining with the help of Artificial Intelligence, incorporation of IKS into contemporary management techniques and so on as well as the ethical use of Artificial Intelligence. The map makes it easier to understand the distribution of ideas in the field and where the most explored and the least explored areas are.

Collaboration Network
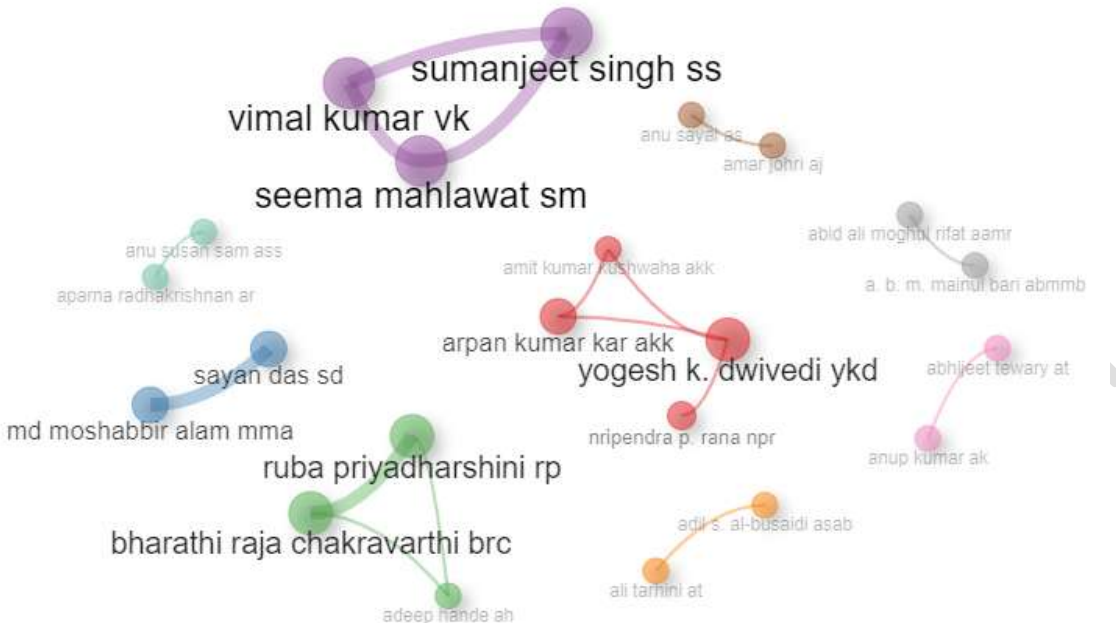
Figure 6: Collaboration Network

This figure also illustrates the interconnected relationship between authors, institutions or countries. That also points to the collaborations that are leading to the research on AI and IKS for management. Other positive factors may be found, such as local or global partnership mechanisms that indicate how this or that country or group of countries is contributing to the development of this sphere.

5. Findings and Implications

This paper offers a full bibliometric review that covers Artificial Intelligence (AI), Indian Knowledge Systems (IKS), and sustainable management. The bibliometric analysis illustrates that these diversified fields received increasing attention in recent years, and even more so in the years between 2019 and 2024. This upward trend reflects a growing trend of utilising AI in improving the functional utility of ancient Indian knowledge lists for contemporary sustainable problems. Consequently, the study indicates that AI has a strong prospect of enhancing the utilization of IKS particularly in areas such as agriculture, management of natural resources, and ecological preservation. The integration of AI in agriculture means that best practices based on IKS can be further advanced to respond to current challenges like climate change, resource use efficiency, SDs, etc. (Khan & Sharma, 2024). The work also provides an overview of the leading authors and organizations offering their input into this up-and-coming sector. The interconnectedness of academic researchers is intensifying, evidenced by this year's increasing interdisciplinary in which fields such as artificial intelligence, sustainability, and indigenous knowledge systems are more interconnected (Deepa Kumari, 2024). Such partnership is very important in moving forward

advancement and ensuring that the benefits of AI are properly harnessed when it comes to IKS. Moreover, the study reveals some recurrent themes that are appearing including the use of AI in the optimization of resources, in advancing sustainable practices in the agricultural sector, and in developing AI that can be informed by and aligned to indigenous people's sort of moral compass. Further, the study indicates that there is potential for the use of AI in IKS, but further research remains fruitful for exploration. For example, among other things, further research is required to determine how AI can help to integrate, record, and transfer the IKS into the digital form so that it would be a lively and continuously developing source. In addition, the study recommends that for IKS, Artificial intelligence can boost the totals, and cultural issues must be put into consideration to safeguard the traditional knowledge system. Applying AI in a way that disempowers Indigenous knowledge and jurisdiction to control those technologies can help integrate those technologies into developing nations and processes in ways that reflect more sustainable and culturally intelligent growth (Timane & Wandhe, 2024). By and large, this research identifies AI and IKS integration as a powerful combination to foster sustainability and advance innovation in the appropriate use of resources in agriculture, as well as in the protection of the environment. Thus, future studies and combined and integrated efforts are needed for the full realization of AI and IKS in support of sustainable development initiatives. AI has the capability of improving IKS-based sustainable practices to a very large extent. It is recommended that subsequent studies should aim at creating better outputs and environments for using Indigenous knowledge in running societies and fixing social issues affecting the environment in real-time (Dwivedi et al., 2015). The discussion underscores the importance of obtaining alliances between the AI domain gurus, traditional knowledge professionals and sustainability professionals. Setting up more interdisciplinary centres in undertaking AI and IKS can act as a boost to development in this field. Taking into account the further development of the cooperation between AI and IKS, governments and international organizations should pay attention to policy that involves traditional knowledge in the sustainable development processes (Lathwal, 2024). Such frameworks can then be greatly enhanced by the use of AI in terms of scalability and Optimisation. In addition to improving sustainability, AI carries the ability to not just advance IKS, but also document and share it, which may be useful in the future. This is most relevant for nations such as India because indigenous knowledge lies at the heart of agricultural growth.

6. Conclusion and Suggestions

The present research presents a comprehensive bibliometric analysis of the application of Artificial Intelligence (AI) and Indian Knowledge Systems (IKS) towards sustainable management. From the paper's results, more evidence exists concerning the prospects of applying AI to improve the use of IKS across disciplines, with a focus on the more sustainable sectors namely, agriculture, resource protection and the environment (K & Kalluraya, 2023). The method employed in the

present study underscores that the integration of AI and IKS provides a radical approach to solving global sustainability problems, intact with the advantages of AI flexibility and accuracy and IKS richness and flexibility. Despite the growing awareness and academic focus, however, there is still an important lack of knowledge concerning the full range of applications of AI regarding traditional knowledge systems. Additionally, the conclusion shows that there is a lack of interdisciplinary approaches to creating frameworks that would ensure the ethical and sustainable utilization of AI in this regard (Deepa Kumari, 2024). In general, the work shows that the combination of AI and IKS offers a highly potent perspective to explore sustainable development by integrating indigenous knowledge with sophisticated technologies. In the following, several recommendations can contribute to the future development of integrating AI and IKS. First, future research should be directed to the advancements of AI tools and platforms to seek solutions which can harmony Indian Knowledge Systems for sustainable management (Kumar & Bisht, 2024) these technologies in AI can be used in areas such as agriculture, water management, and the area of conservation of biodiversity to improve on conventional methods. Second, there is a strong need for interdisciplinary cooperation between AI scientists, environmentalists, sustainability professionals, and Indigenous people. The creation of cross-disciplinary research centres working on the integration of technology advancement with Indigenous practice in tackling sustainability issues would lead to innovation and idea generation for sustainability during practice and would make sure that the problems are viewed from a practical and realistic standpoint (Godavarthi, 2023). It is therefore the policy development that the various governments should come up with policies that institutionalize the use of AI in preservation and development of the traditional knowledge systems. Such frameworks have to incorporate procedural and substantive ethical concerns, namely, the indigenous knowledge IP protection, and cultural sensitivity of AI interventions. Further, policies should facilitate the use of AI to enhance local knowledge systems that make sustainable practices more practical and relevant to the contemporary world (Dwivedi et al., 2015). Another insightful area to be explored in successive interventions is the consolidation and virtual creation of the Indian Knowledge Systems. Machine learning and data archiving solutions, for example, are the ways that AI keeps track of and preserves traditional knowledge for future use. Two potential directions for further work could lie in applying the approaches described here to fields other than agriculture: for example, in healthcare and education. For example, the IKS could be blended with AI in healthcare for individualized treatments, as well as AI in the context of the implementation of IKS into smart city development for the improvement of the city's environmental conditions. Lastly, it will be required to consider the ethical concerns in integrating AI with IKS. Therefore, when AI is complemented by traditional knowledge systems, the cultures of the practices must be preserved rather than trivializing the technological applications. Therefore, if the present suggestion is followed to the latter, there would be

The Asian Thinker
A Quarterly Bilingual Peer-Reviewed Journal for Social Sciences and Humanities
Year-7 Volume: IV (Special), October-December, 2025
Issue-28 ISSN: 2582-1296 (Online)
Website: www.theasianthinker.com   **Email**: asianthinkerjournal@gmail.com

innovative utilization of AI and IKS, especially in bearing sustainability, and cultural heritage, as other ethical environmental challenges are effectively solved.

References

- Amani, S. (2024). Integrating Indian Knowledge System: Revitalizing India's Educational Landscape. *International Journal for Multidisciplinary Research*, *6*(3), 1–6. www.ijfmr.com
- Banerjee, S. (2022). Indian Knowledge Systems: The Central Plank of the New Education Policy. *Breakthrough*, *22*(3), 4–13.
- Blose, P., & Gumbo, M. T. (2024). Developing a Framework for Integrating IKS in Technology Education with Sustainable Development Principles. *African Journal of Research in Mathematics, Science and Technology Education*. https://doi.org/10.1080/18117295.2024.2356416
- Deepa Kumari, M. (2024). Indian Knowledge for Sustainable Futures. *International Journal of Novel Research and Development*, *9*(3). www.ijnrd.org
- Dwivedi, Y. K., Wastell, D., Laumer, S., Henriksen, H. Z., Myers, M. D., Bunker, D., Elbanna, A., Ravishankar, M. N., & Srivastava, S. C. (2015). Research on information systems failures and successes: Status update and future directions. *Information Systems Frontiers*, *17*(1), 143–157. https://doi.org/10.1007/s10796-014-9500-y
- Gaviria-Marin, M., Merigó, J. M., & Baier-Fuentes, H. (2019). Knowledge management: A global examination based on bibliometric analysis. *Technological Forecasting and Social Change*, *140*, 194–220. https://doi.org/10.1016/j.techfore.2018.07.006
- Godavarthi Assistant Professor, G. (2023). Indian Knowledge System in Indian English and Literature: A Critical Analysis of National Education Policy 2020. *International Journal of Research*. https://doi.org/10.5281/zenodo.7823715
- K, V. L., & Kalluraya, S. (2023). History of Indian Knowledge System. *International Journal of Multidisciplinary Research*, *9*(12), 352–355.
- Khan, S., & Sharma, M. (2024). An Overview on Indian Knowledge System. *Integrated Journal of Research in Arts and Humanities*, *4*(4), 42–46.
- Kumar, D., & Bisht, H. (2024). Indian Knowledge System: Post Colonialism and Globalisation Era. *Shodh Samarth*, *1*(2), 124–137.
- Kumar, M. J. (2024). Forging Connections: Integrating Indian Knowledge Systems in Higher Education. *IETE Technical Review*, *41*(3), 271–273. https://doi.org/10.1080/02564602.2024.2342625
- Lathwal, S. (2024). Integration of Indian Indigenous Knowledge System in Management: Prospects and Challenges the Creative Commons Attribution License (CC BY 4.0). In

International Journal of Trend in Scientific Research and Development (IJTSRD) (Issue 1). www.ijtsrd.com/papers/ijtsrd63500.pdf

- Maharana, K. C., & Acharya, S. (2024). Mapping the Research Landscape of Indian Handloom: A Bibliometric Analysis. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.4909087

- Mandavkar, P. (2023). Indian Knowledge System (IKS). *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.4589986

- Mishra, S., Tripathy, A. B., & Patro, R. (2024). Integrating Traditional Indian Knowledge System in Indian Higher Education. *International Journal of Current Science*, *14*(3), 346–352. www.ijcspub.orgwww.ijcspub.org

- Rajoura, M. C., & Rajoura, M. N. (2022). Corporate Lessons from Indian Knowledge System: Learning from the Glorious Past for Building a Strong India. *Sachetas*, *1*(3), 78–83. www.sachetas.in

- Sharma, P. (2024). Indian Knowledge System and Indian Political Philosophy - Contemporary. *Journal of Informatics Education and Research*, *4*(3), 1268–1275.

- Timane, R., & Wandhe, P. (2024). Indian Knowledge System. *Journal of Emerging Technologies and Innovative Research*, *11*(2), 512–529. www.jetir.orge512