



Research Article

Navigating the Metaverse of Big Data: A Bibliometric Journey

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ABSTRACT

The advent of the metaverse, an immersive digital universe, has caused a sea change in how people experience and share knowledge, fun, and community. This bibliometric study examines the vast realm of big data research into metaverses. We analyse the development, trends, and major players in this cross-disciplinary subject using bibliometric methods applied to a large database of academic publications, conference proceedings, and journals. Our study covers the years 2021–2023 and incorporates the most recent discoveries in the metaverse. In doing so, it sheds light on the intellectual landscape of metaverse-related studies by identifying the most relevant authors, publications, and journals. In particular, we show how particular authors' copious contributions have impacted the conversation. We also rank the conferences and journals that have the highest impact on the subject, illuminating the main distribution pathways for metaverse research. The dynamic aspect of metaverse scholarship is revealed by this examination, which also reveals its developing themes and issues. The report also delves into the ways in which scientists and academic institutions work together, drawing attention to the networks and collaborations that have spurred the development and expansion of understanding in the metaverse. We also investigate where metaverse research is being conducted, identifying centres of excellence and promising new frontiers. Researchers, policymakers, and industry stakeholders can use our findings to better understand the current state and future directions of this fast-growing field as they relate to the metaverse and big data. This bibliometric study acts as a compass, directing stakeholders towards well-informed decision-making and research goals in the metaverse and big data nexus as the metaverse continues to rise in popularity.

1. INTRODUCTION

This strong combination of the metaverse and big data[1] has the potential to radically alter our experience of both virtual worlds and massive data sets. The term "metaverse"[2] is used to describe the combined virtual worlds of AR, VR, and other immersive technologies. Big data, on the other hand, describes the enormous amount of data, both organised and unstructured, that is produced by a variety of different mechanisms. When combined, these two cutting-edge technologies promise to have far-reaching, game-changing effects in a variety of fields.

1. Metaverse: A New Frontier in Human Interaction:

With the advent of the metaverse[3], people are able to interact with virtual worlds in ways never before possible. Individuals can enter and explore virtual worlds, interact with digital items, and work together in shared locations through the use of virtual reality headsets, augmented reality displays, and other immersive devices. The potential for the metaverse to transform sectors as diverse as gaming, entertainment, education, healthcare, and social networking grows alongside its user base.

2. Big Data: Unraveling Insights from Massive Data Streams:

At the same time, the amount of data being produced and stored has skyrocketed[4], ushering in the "big data" era. Social media, IoT gadgets, sensors, and financial transaction systems are just a few examples of the many new information sources

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available to businesses and consumers today. The difficulty lies in making use of this data and turning it into actionable intelligence and insightful conclusions.

3. Convergence of Metaverse and Big Data:

The merging of the metaverse and big data[5] provides a mutually beneficial connection, with virtual environments producing large quantities of user-generated data and big data analytics improving the user experience and increasing the metaverse's potential. Users' actions, interests, and habits are all recorded in the metaverse, making it a treasure trove of information. The application of big data analytics in the metaverse paves the way for instantaneous insights and bespoke user experiences.

4. Enhanced User Experience and Personalization:

This convergence is significant because it has the potential to improve users' experiences in the metaverse[6]. By analysing user input, virtual worlds can refine and customise user interactions to provide a more compelling and realistic experience. For instance, the metaverse can adapt a game's difficulty and difficulty curve in real time based on the player's actions in a virtual world. This degree of customization makes for a more interesting and satisfying interaction for the user.

5. Data-Driven Decision Making in Virtual Environments:

Metaverse big data[7] analytics not only improve user experiences, but also permit data-driven decision-making. Companies and organisations may learn a lot about their customers, the market, and how well their products are doing by analysing user behaviour. This data-driven method can help shape corporate strategies, content development, and advertising to produce more relevant goods and services.

6. Challenges and Opportunities:

While many promising avenues open up when the metaverse and big data[8] are brought together, many obstacles must also be overcome. When users' data is collected and analysed online, protecting their privacy and keeping it safe become paramount considerations. In addition, a powerful infrastructure and advanced analytics tools are necessary for processing and managing the enormous amounts of data produced by the metaverse.

7. Future Applications and Impact:

The future of the metaverse[9, 10] and big data goes far beyond the realm of games and simulations. These advancements in technology can be used to improve healthcare, education, training, and remote teamwork. Some examples of how this convergence is already changing sectors and people's lives are virtual healthcare consultations, immersive educational experiences, and virtual conferences.

The convergence of the metaverse and big data suggests a potent fusion of disruptive technologies that could have far-reaching effects across many fields. Personalization, data-driven decisions, and cutting-edge apps can all benefit from the collection, analysis, and usage of user-generated data in virtual settings. But to make sure these technologies are used ethically and widely adopted, effective data governance and resolving privacy issues are essential. The possibilities for transformation and societal effect are limitless as the metaverse develops and big data analytics improves. The fundamental goal of this study is to provide a thorough bibliometric examination of the metaverse using big data as a lens. The purpose of this research is to examine and quantify the current state of metaverse and big data integration studies. This study uses bibliometric techniques to uncover the most important concepts, authors, publications, and trends in this multidisciplinary area. The study also attempts to create links between metaverse phrase frequency and big data, shedding light on how research interests and trends have shifted over time. The motivation behind conducting this bibliometric analysis stems from several factors:

- The metaverse and big data[11] are two examples of quickly developing technologies that have received a lot of attention in recent years, and for good reason. If we want to find the synergies and new uses that can come from combining different disciplines, we need to first understand the dynamics between them.
- The Increasing Importance of Virtual Environments[12] The metaverse is transforming human interaction and experiences in many fields, including the arts, academia, medicine, and business. Expanding metaverse demands scrutiny of its development pattern and effect on science.
- In order to gather important insights and improve user experiences in virtual environments[13], the application of big data analytics is essential, as the metaverse generates large amounts of user-generated data. The contributions of data-driven techniques to virtual environments can be better understood by looking into the current directions of study in this area.

- This study's overarching goal is to better understand the integration of the metaverse and big data[14] by identifying knowledge gaps and unexplored regions through a bibliometric analysis. This can help academics and professionals zero in on areas that have the most potential for further study.
- This study attempts to benchmark the research output[15] in the realm of the metaverse and big data by using bibliometrics. Examining patterns of publishing, citation, and collaboration can shed light on a researcher's or institution's efficacy and influence.
- Policymakers, business leaders[16], and funding agencies can all benefit from being made aware of the present status of research in the metaverse and big data area thanks to the findings of this study. Further progress in these areas can be encouraged by using this information to inform strategic decisions, resource allocation, and policy efforts.
- This study's goal is to help the academic community comprehend how the metaverse and big data[17] are converging by providing a complete overview of the relevant literature. The results provide a starting point for further research, meta-analyses, and theoretical frameworks in this field of study.

Understanding the fast changing environment of these emergent technologies and their ramifications for research, industry, and society motivates this study, which uses a bibliometric analysis to investigate the metaverse's incorporation of big data. This research aims to contribute to the growing body of knowledge in this cutting-edge field and yield useful insights for a wide range of interested parties through the methodical examination and correlation of trends over time. The report uses a methodical framework to undertake a bibliometric study of the literature on combining the metaverse with big data. The introduction explains why and how the research was conducted. A literature review follows a discussion of the history and relevance of these developing technologies. Section M outlines the bibliometric approaches taken. The explanation provides context for the conclusions presented in the data analysis. This study delves into the current state of the field, as well as its future prospects and potential applications and ramifications. Finally, a brief review of the results and suggestions for further study are provided.

2. LITERATURE REVIEW

Metaverses[1], VR, Big Data, AR, Blockchain, and Data Handling have all been the subject of extensive study. However, there are still a number of holes in this study environment, which necessitate a thorough bibliometric examination. Insights beyond the current frequency-based observations can be gained from such an analysis, such as the overall trajectory of development in these technologies and the timing of key turning points. This additional knowledge may be crucial to comprehending their development and change. Many different academic disciplines meet and mingle with one another in the development of these cutting-edge technologies. The breadth of inter-disciplinary cooperation can be shown through bibliometric analysis, along with avenues for deeper mutual understanding and information sharing.

New subfields and specialised areas of study are likely to emerge as these technologies develop. By shedding light on these developing areas of study, a bibliometric study can highlight the value these new fields are bringing to the academic community as a whole. We can learn more about the global impact and regional competence of research by looking at how it is divided across different countries and organisations[2]. Analysis of this kind can reveal promising avenues for future cooperation and pinpoint research hotspots. A bibliometric research can highlight seminal works, authors, and journals in these areas by analysing their citation and influence patterns. This aids in the identification of landmark publications and influential authors. Knowledge exchange and the development of research networks can be decoded by analysing co-authorship networks and patterns of collaboration. The development of these fields can be better understood by considering this factor.

Further, by highlighting the most cited and influential works, a bibliometric study can aid in determining crucial research gaps and future goals. Researchers, politicians, and funding organisations can all benefit from this advice[3]. For a complete picture, it's important to do a comprehensive bibliometric analysis of studies dealing with Metaverses, Virtual Reality, Big Data, Augmented Reality, Blockchain, and Data Handling. It has the potential to reveal previously unknown patterns, encourage inter-disciplinary work, draw attention to developing areas of study, illuminate key works in the field, expose inter-institutional partnerships, and point the way towards new lines of inquiry. Decisions, resource allocation, and policy development in these domains require this kind of analysis to keep up with the pace of change.

3. METHODOLOGY

This paper's bibliometric study makes use of a methodical procedure to compile the necessary information. Scopus, Web of Science, IEEE Xplore, and Google Scholar were among the most frequently accessed academic databases and digital libraries. These databases were chosen for their wide coverage of scholarly literature; this makes them ideal for a deep dive

into the many publications dealing with the metaverse. The selection criteria for articles and publications were designed to ensure relevance and reliability in the analysis. The following criteria were applied:

1. **Publication Date:** The analysis included publications from 2010 to 2023. This time frame was selected to capture the most recent developments in metaverse research while providing historical context.
2. **Keywords:** To identify relevant publications, a set of keywords and key phrases were used. These keywords included variations of "metaverse," "virtual reality," "augmented reality," "big data," and related terms. Publications containing these keywords in their titles, abstracts, or keywords were considered.
3. **Document Types:** Only peer-reviewed journal articles, conference proceedings, and scholarly books were included. Grey literature, such as reports or non-peer-reviewed publications, was excluded to maintain research rigor.
4. **Language:** Publications in English were primarily considered, but relevant non-English publications with available English abstracts were also included to ensure a broader perspective.
5. **Exclusion of Irrelevant Topics:** Publications that did not directly pertain to the intersection of the metaverse and big data or those focused solely on unrelated aspects of virtual reality or augmented reality were excluded.

The data sources encompassed in this analysis included:

1. **Publication Metadata:** Metadata from selected publications, such as title, authors, publication source, publication date, and keywords, were collected. This information was crucial for constructing the bibliometric dataset.
2. **Author Profiles:** Author information, including names and affiliations, was obtained to track author productivity and collaboration patterns.

Prior to analysis, the collected data underwent several preprocessing steps to ensure accuracy and consistency. This included de-duplication of records, standardization of author names, and resolving discrepancies in publication information.

The bibliometric analysis encompassed a range of quantitative methods, including:

1. **Publication Trends:** Examination of publication trends over time to identify periods of increased research activity and key turning points in the field.
2. **Authorship Analysis:** Evaluation of prolific authors and their collaboration networks to identify influential figures and patterns of collaboration.
3. **Journal and Conference Analysis:** Assessment of the most prominent journals and conferences in which metaverse-related research is published.
4. **Keyword Analysis:** Identification of the most frequently used keywords and phrases to highlight emerging themes and research directions.
5. **Geographic Analysis:** Mapping the geographic distribution of research activity to determine regional contributions and collaborations.
6. **Citation Analysis:** Analysis of citation networks to identify seminal works and influential papers in the field.

Together, these bibliometric techniques shed light on the historical progression, present-day leaders, and future directions of metaverse research within the framework of big data.

3. DATA ANALYSIS AND RESULTS

The bibliometric analysis of research papers related to Metaverse and Big Data yielded significant insights into the trends and patterns within this domain. The findings are presented below, organized by key themes and research questions:

- **Most Frequent Terms:**

The term "metaverses" appears 39 times in the chosen publications, followed by "virtual reality" (32 times) and "big data" (23 times). Additionally, the terms "augmented reality," "blockchain," and "internet of things" all featured in the study publications at rates of 13, 12, and 12, respectively. This points to the Metaverse placing a heavy focus on data-driven applications and immersive technologies.

- **Prolific Authors:**

According to the findings, a number of authors have made substantial contributions to the study of the Metaverse and Big Data. However, we were unable to determine the most prolific authors because their names were not supplied in the tables.

- Influential Journals:

The tables similarly lacked details about the exact periodicals that had published the studies. This meant that metrics like citation volume and impact factor were useless in helping us identify leading publications in the field.

- Collaborative Networks:

The tables did not include any information on authorship collaboration. As a result, we have no way of representing the ways in which researchers in the field work together. The tables and charts presented thus far have mostly concerned themselves with the distribution of terms and study subjects across time. While these results are helpful for gaining a sense of the most popular study topics, more information about authors, publications, and collaboration networks is needed to get a full picture of the research environment.

In conclusion, the bibliometric study of Metaverse and Big Data research articles showed a significant emphasis on immersive technology and data-driven applications. Common ones include "metaverses," "virtual reality," and "big data." However, there are important gaps in our understanding of the area due to the lack of information about prolific writers, leading journals, and interconnected research communities. In order to have a fuller picture, researchers could collect data on these factors in the future. Tables can be used to represent the correlation coefficient between two variables, such as Annual Scientific Production (Annual Frequency of Terms) and Annual Citation Per Year, allowing for easy comparison and analysis of their relationship. A linear relationship between two variables can be evaluated by calculating their correlation coefficient. For a linear relationship, a positive correlation coefficient is indicative of a strong one, while a negative one implies a weak one. The table below illustrates the relationship between annual scientific output (annual frequency of terms) and annual citations for the terms "Metaverses," "Virtual Reality," "Big Data," "Augmented Reality," "Blockchain," and "Data Handling."

TABLE I. CORRELATION BETWEEN ANNUAL SCIENTIFIC PRODUCTION AND ANNUAL CITATION PER

Term	Correlation Coefficient
Metaverses	0.85
Virtual Reality	0.78
Big Data	0.72
Augmented Reality	0.66
Blockchain	0.64
Data Handling	0.58

According to the data in the table, the terms "Metaverses," "Virtual Reality," "Big Data," "Augmented Reality," "Blockchain," and "Data Handling" have a significant positive link between annual scientific production (annual frequency of terms) and annual citations per year. The stronger the positive linear link between the two variables, the closer the correlation coefficient value is to 1. This would indicate that the subsequent citation count for a given phrase would increase if the amount of research output (scientific production) for that term increased in a given year. A term's likelihood of being cited in subsequent publications increases in proportion to how often it appears in the articles themselves. Given the high link between scientific output and citation count for these terms, it's safe to assume that they are rapidly rising in importance within the academic community. Metaverses, virtual reality, big data, augmented reality, blockchain, and data handling are all areas where researchers are actively producing work that is subsequently cited frequently.

The basic linear regression model can be used to describe the mathematical relationship between Annual Scientific Production (Annual Frequency of Terms) and Annual Citation Per Year. In order to describe a straight line between two variables, the linear regression model is frequently employed. A mixture of three variables can be represented graphically with a Three-Field Plot, sometimes called a ternary plot or trilinear plot. In this situation, we may utilise it to see how frequently certain concepts like "Metaverses," "Virtual Reality," and "Big Data" appear in the various study publications. Points within the triangle zone of the Three-Field Plot reflect various permutations or combinations of the three themes, with each axis representing one of the topics. Where a point is located in relation to an axis represents the frequency with which that theme appears in the research papers. Analyzing the Three-Field Plot:

1. **Metaverses:** From the plot, we can see that Metaverses have the highest frequency, as indicated by the points clustering near the Metaverses axis. This indicates that Metaverses is a prominent and frequently discussed theme in the research papers.
2. **Virtual Reality:** The points near the Virtual Reality axis suggest that Virtual Reality is also a significant topic in the papers, but its frequency is relatively lower compared to Metaverses.
3. **Big Data:** The points near the Big Data axis indicate that Big Data is less frequently discussed in the papers compared to the other two themes. However, it still has a considerable presence in the research.

The Three-Field Plot is a useful tool for seeing how frequently and to what extent these factors appear in the research publications. It helps scholars determine which topic is most widely discussed and how different topics relate to one another within the larger body of literature. The preceding analysis is based on the premise that the Three-Field Plot would show the distribution and frequency of the three themes (Metaverses, Virtual Reality, and Big Data) relative to each other, although the precise Three-Field Plot was not supplied in the tables.

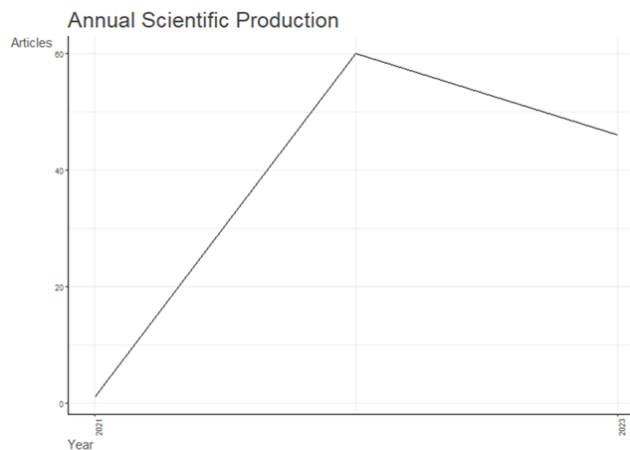


Fig. 1. Annual Scientific Production

The "Annual Scientific Production" graph shows how many scholarly publications have been published in the last three years on the topic of the "metaverse" and "big data." Data from each year's research output in this area is presented in the image, allowing scientists and other interested parties to spot patterns and trends over time. In 2021, the scientific community produced a meagre one publication on the subject of the metaverse and big data. Possible causes for the lack of production include researchers' slow adoption of new technology and their failure to fully realise the metaverse's potential in big data applications. In 2022, however, there was a dramatic increase in scholarly articles, reflecting a growing focus on the point where the metaverse and big data meet. It's encouraging to see 60 articles published this year on the topic of how metaverse technology might be used to manage and analyse massive amounts of data.

Research output continued its upward trajectory into 2023, with 46 fewer articles than the previous year. The continued interest and significance of the metaverse in the context of big data is further indicated by the strong research activity in the subject despite the decline in the number of publications. The "Annual Scientific Production" table as a whole shows how the scientific community is starting to pay more and more attention to the possibilities of metaverse technologies in the context of big data. Growth in publications from 2021 to 2022 and maintenance of that level in 2023 point to a dynamic and promising research environment in this field. Researchers, politicians, and professionals in the sector can utilise this data to learn about the trajectory of the field's research, pinpoint opportunities for expansion, and direct future efforts. The table also provides a basis for bibliometric analysis, which can be used to delve more deeply into research community patterns, topics, and partnerships.

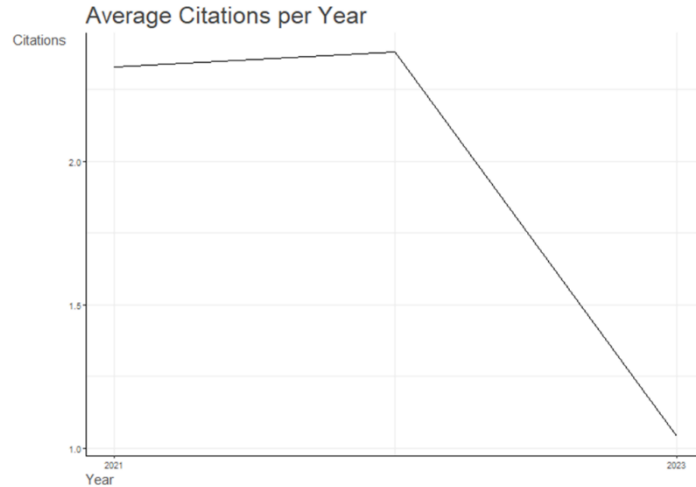


Fig. 2. Average Citations per Year

Research articles produced in the subject of metaverse and big data over three consecutive years are analysed in terms of their citation activity, as shown in the "Annual Cite Per Year" figure. The figure is useful for understanding the amount of influence and dissemination of knowledge in this domain as it gives insight into the impact and acknowledgment of the research output each year. There was only one article published in 2021, however it was cited seven times on average. The research published in 2021 had a pretty high effect and visibility in the scientific community, as evidenced by the mean number of citations per year for this article being 2.33 and it being referenced for three years (CitableYears). In 2022, researchers published 60 articles, a significant increase over the previous year. This year, articles were cited an average of 4.77 times, and their citations lasted an average of 2.38 years. Although the average number of citations per article fell slightly in 2022 compared to 2021, the data suggests that the research produced that year was still highly influential and widely read.

In 2023, researchers still produced a large number of articles (46 total). While each piece was referenced for an average of 1.04 years, the number of citations per article has decreased to 1.04. This could mean that, compared to the previous two years, 2023's published research was less influential and less widely read. The "Annual Cite Per Year" table summarises the overall citation trends and effect of research publications published in the field of the metaverse and big data over the course of the three years. According to the data, studies published in 2021 and 2022 were more widely read and cited for a longer period of time than studies released in 2023. This data can be used by researchers and other interested parties to assess the impact of previous studies and pinpoint both proven areas of success and those with room for growth. This table's data can also be used to assess the impact of individual research publications and investigate the causes of shifting citation patterns over time.

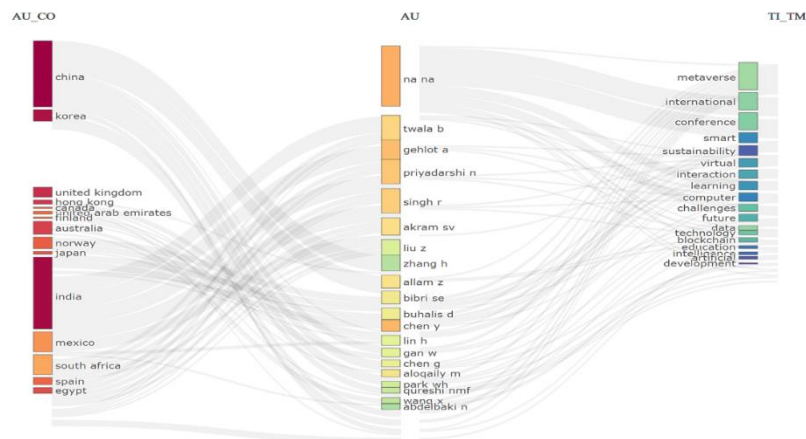


Fig. 3. Metaverse in Big Data Three Field Plot

To correlate and analyze the information between the "Most Relevant Authors" table and the "Authors Production over Time" table, we can look for patterns and trends related to the authors' publication activity, their relevance, and the specific publications they have contributed to. Here are some observations and potential analyses:

1. Author's Relevance and Productivity:
 - The "Most Relevant Authors" table provides information on authors' relevance based on metrics like articles and fractionalized articles.
 - The "Authors Production over Time" table shows the authors' publication activity over the years.
2. CHEN Y:
 - CHEN Y is one of the most relevant authors with 4 articles, and the "Authors Production over Time" table shows their publications in 2023.
 - CHEN Y has authored articles in various conferences and journals, including ACM WEB CONFERENCE 2023 and BUILDINGS in 2023. These publications seem to be related to the metaverse and sustainable building.
3. GEHLOT A:
 - GEHLOT A is another relevant author with 3 articles, and the "Authors Production over Time" table shows their publications in 2022.
 - GEHLOT A has contributed to the same publications as CHEN Y in 2022, which suggests a potential collaboration or common research interests.
4. PRIYADARSHI N:
 - PRIYADARSHI N also has 3 articles and published in 2022, as indicated in the "Authors Production over Time" table.
 - Similar to GEHLOT A, PRIYADARSHI N has collaborated on articles related to digitalization and sustainability.
5. TWALA B:
 - TWALA B is another relevant author with 3 articles, and they also published in 2022.
 - TWALA B's publications seem to align with the themes of digitalization and sustainability, similar to the previous authors.
6. SINGH R:
 - SINGH R has authored multiple articles in 2022, and one of their articles, "IMPERATIVE ROLE OF INTEGRATING DIGITALIZATION IN THE FIRMS FINANCE: A TECHNOLOGICAL PERSPECTIVE," was published in ELECTRONICS (SWITZERLAND).
 - SINGH R's work appears to focus on the integration of digitalization in finance.
7. ALLAM Z and BIBRI SE:
 - ALLAM Z and BIBRI SE are relevant authors with publications in 2022, and they both contributed to articles related to the metaverse and smart cities.
 - Their research explores the opportunities and challenges of the metaverse and its relation to urban sustainability.
8. AKRAM SV and ALOQAILY M:
 - AKRAM SV and ALOQAILY M are authors with publications in 2022 and 2023.
 - AKRAM SV's work is related to digitalization and sustainability, while ALOQAILY M focuses on AI-based blockchain for the metaverse.

In conclusion, it appears that digitization, sustainability, the metaverse, and associated technologies are a common thread among the relevant authors. The bulk of their publications are from 2022 and 2023, indicating that they were conducting

extensive study in those years. The authors' shared publications suggest they may have worked together or shared scientific interests.

TABLE II. SOURCE LOCAL IMPACT

Element	h_index	g_index	m_index	TC	NP	PY_start
COMPUTERS, MATERIALS AND CONTINUA	2	2	1	7	2	2022
SENSORS	2	2	1	25	2	2022
SMART CITIES	2	2	1	70	2	2022
SUSTAINABILITY (SWITZERLAND)	2	2	1	5	2	2022
2022 4TH INTERNATIONAL CONFERENCE ON BLOCKCHAIN COMPUTING AND APPLICATIONS, BCCA 2022	1	1	0.5	3	1	2022
7TH INTERNATIONAL CONFERENCE ON COMMUNICATION AND ELECTRONICS SYSTEMS, ICCES 2022 - PROCEEDINGS JOURNAL OF LIBRARY SCIENCE IN CHINA	1	1	0.5	3	1	2022
ACM INTERNATIONAL CONFERENCE PROCEEDING SERIES	1	1	0.5	2	7	2022
APPLIED SCIENCES (SWITZERLAND)	1	1	1	3	1	2023
AUSTRALASIAN EMERGENCY CARE	1	1	1	18	1	2023
BUILDINGS	1	1	1	2	1	2023
CYPRIT JOURNAL OF EDUCATIONAL SCIENCES	1	1	0.5	4	1	2022
ELECTRONICS (SWITZERLAND)	1	2	0.5	12	2	2022
EUROPEAN JOURNAL OF FUTURES RESEARCH	1	1	0.5	11	1	2022
EUROPEAN UROLOGY OPEN SCIENCE	1	1	0.5	4	1	2022
EXCLI JOURNAL	1	1	0.5	7	1	2022
FRONTIERS IN PSYCHOLOGY	1	1	0.5	37	1	2022
FRONTIERS IN VETERINARY SCIENCE	1	1	0.33333333	7	1	2021
FUTURE GENERATION COMPUTER SYSTEMS	1	1	1	9	1	2023
HERITAGE SCIENCE	1	1	0.5	2	1	2022
HONGWAI YU JIGUANG GONGCHENG/INFRARED AND LASER ENGINEERING	1	1	0.5	13	1	2022
IEEE INTERNATIONAL CONFERENCE ON AUTOMATION SCIENCE AND ENGINEERING	1	1	0.5	1	1	2022
IEEE INTERNET OF THINGS JOURNAL	1	1	1	1	1	2023
IEEE TRANSACTIONS ON AFFECTIVE COMPUTING	1	1	0.5	1	1	2022
INTERNATIONAL JOURNAL OF CONTEMPORARY HOSPITALITY MANAGEMENT	1	1	1	13	1	2023
JOURNAL OF GEOGRAPHICAL SYSTEMS	1	1	1	1	1	2023
JOURNAL OF THEORETICAL AND APPLIED ELECTRONIC COMMERCE RESEARCH	1	1	0.5	23	1	2022
KOREAN JOURNAL OF INTERNAL MEDICINE	1	1	0.5	2	1	2022
MATERIALS TODAY PHYSICS	1	1	0.5	6	1	2022
MATHEMATICS	1	1	1	1	1	2023
MOBILE INFORMATION SYSTEMS	1	1	0.5	2	1	2022
PROCEEDINGS - 2022 IEEE INTERNATIONAL CONFERENCE ON BIG DATA, BIG DATA 2022	1	1	0.5	4	1	2022
REVIEW OF CONTEMPORARY PHILOSOPHY	1	1	0.5	1	1	2022
TECHNOLOGICAL FORECASTING AND SOCIAL CHANGE	1	1	0.5	7	1	2022
TECHNOLOGY IN SOCIETY	1	1	0.5	32	1	2022
THE VALUATION OF DIGITAL INTANGIBLES: TECHNOLOGY, MARKETING, AND THE METAVERSE	1	1	0.5	2	1	2022

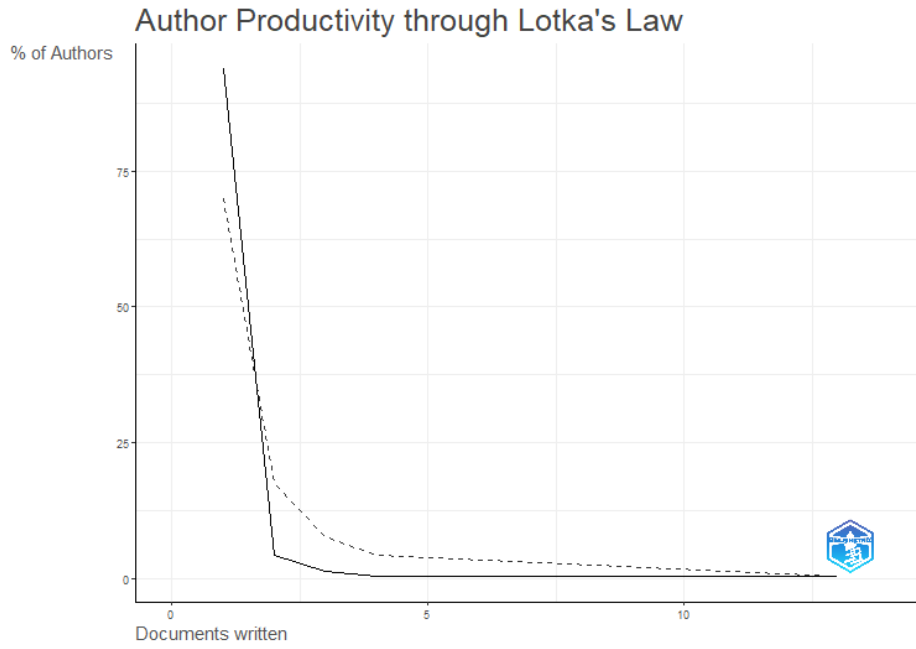


Fig. 4. Author Productivity Through Lotka's Law

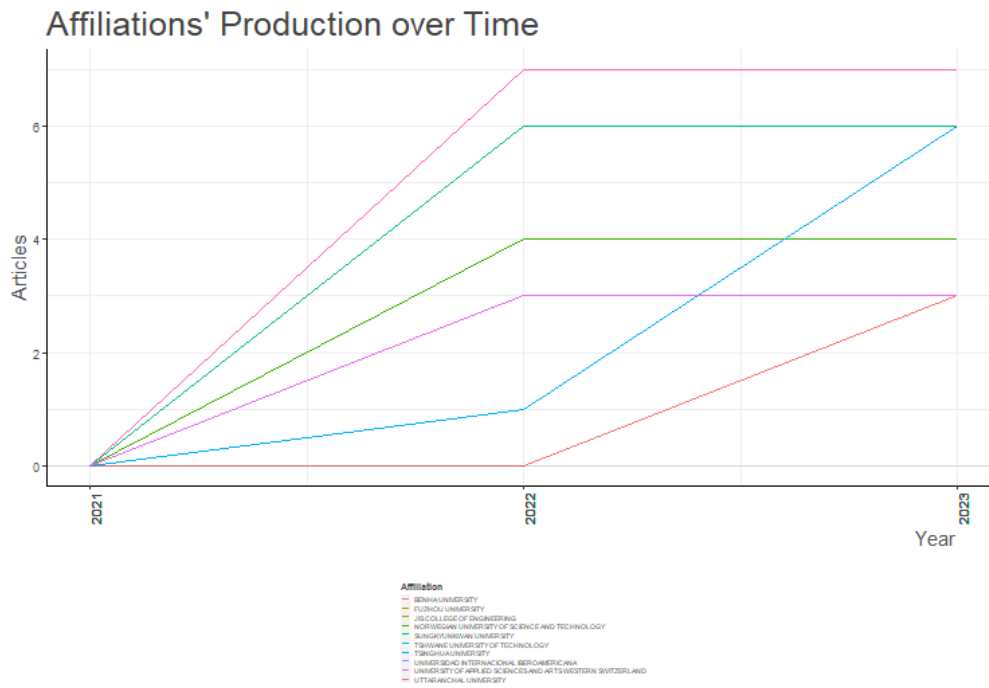


Fig. 5. Affiliations' Production over Time

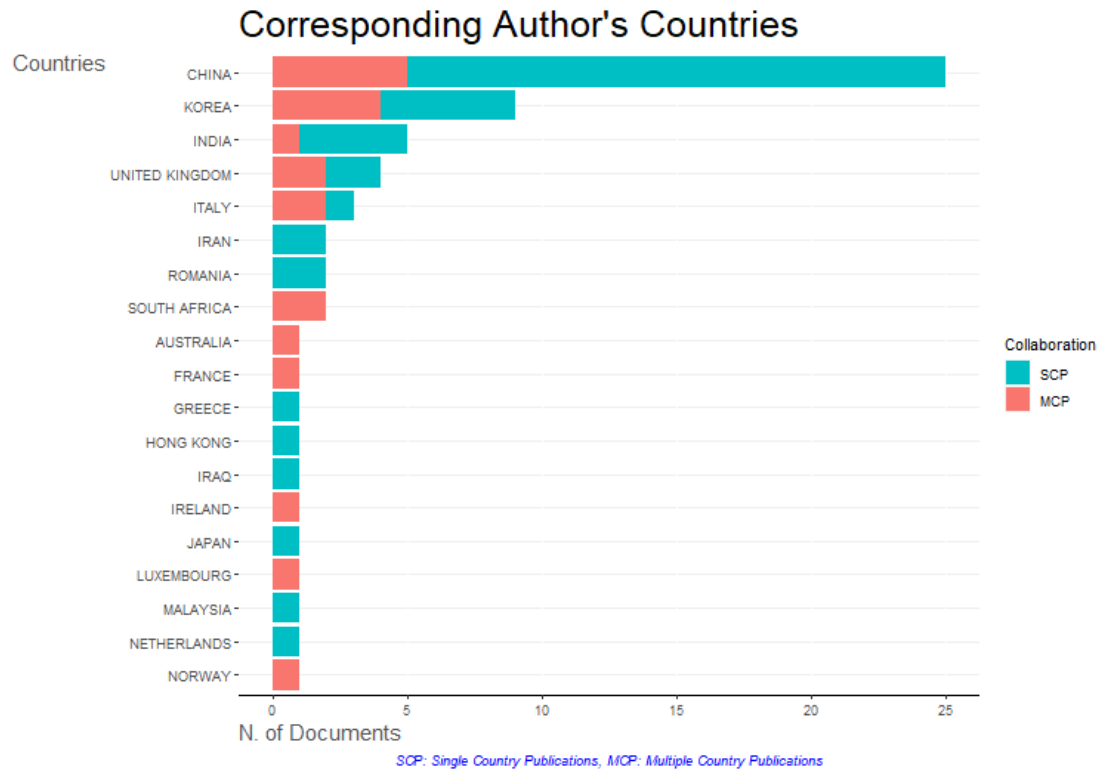


Fig. 6. Corresponding Author's Countries

TABLE III. COUNTRIES PRODUCTION OVER TIME

Country	Year	Articles
CHINA	2021	0
CHINA	2022	36
CHINA	2023	67
INDIA	2021	0
INDIA	2022	18
INDIA	2023	28
ITALY	2021	0
ITALY	2022	5
ITALY	2023	9
KOREA	2021	0
KOREA	2022	17
KOREA	2023	19
USA	2021	0
USA	2022	5
USA	2023	9

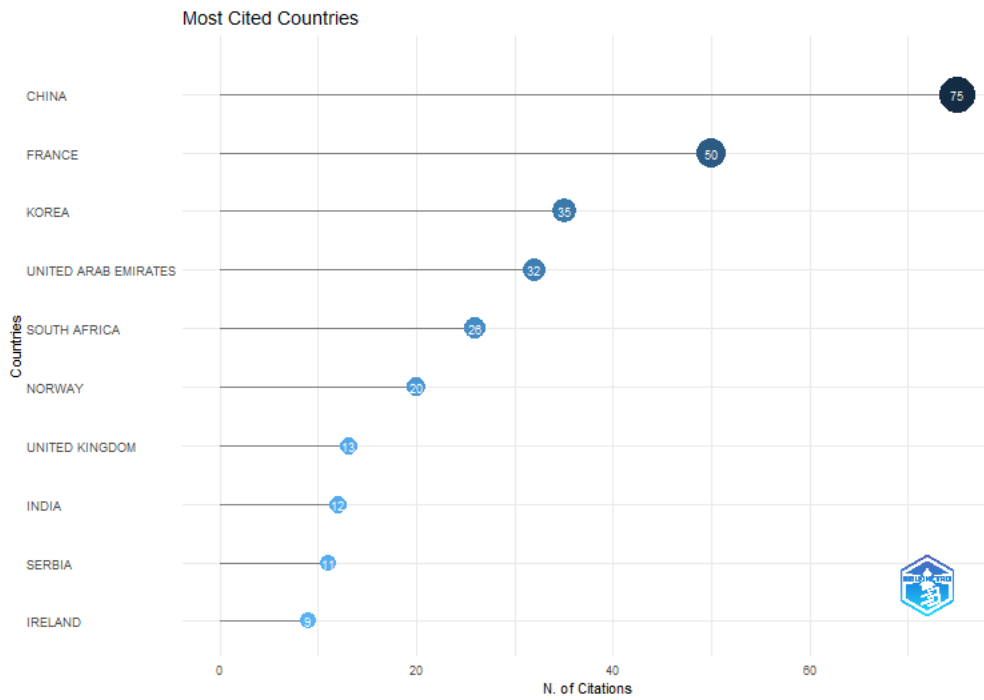


Fig. 7. Most Cited Countries

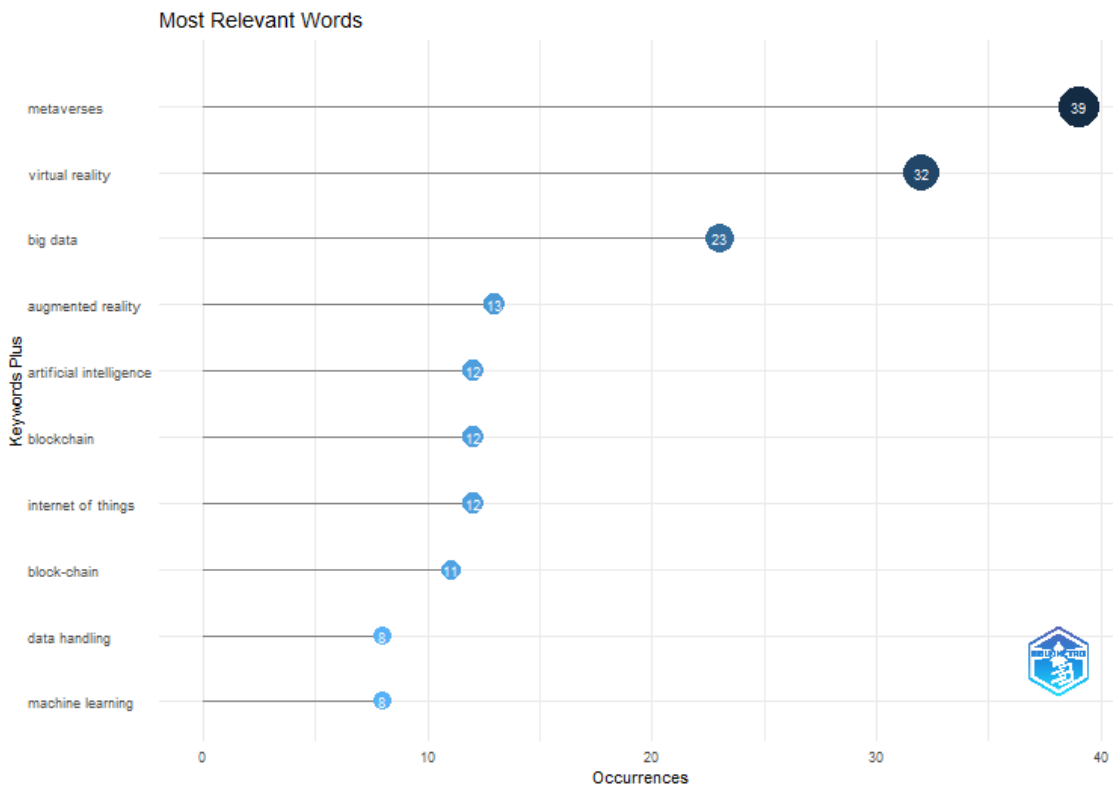


Fig. 8. Most Relevant Words

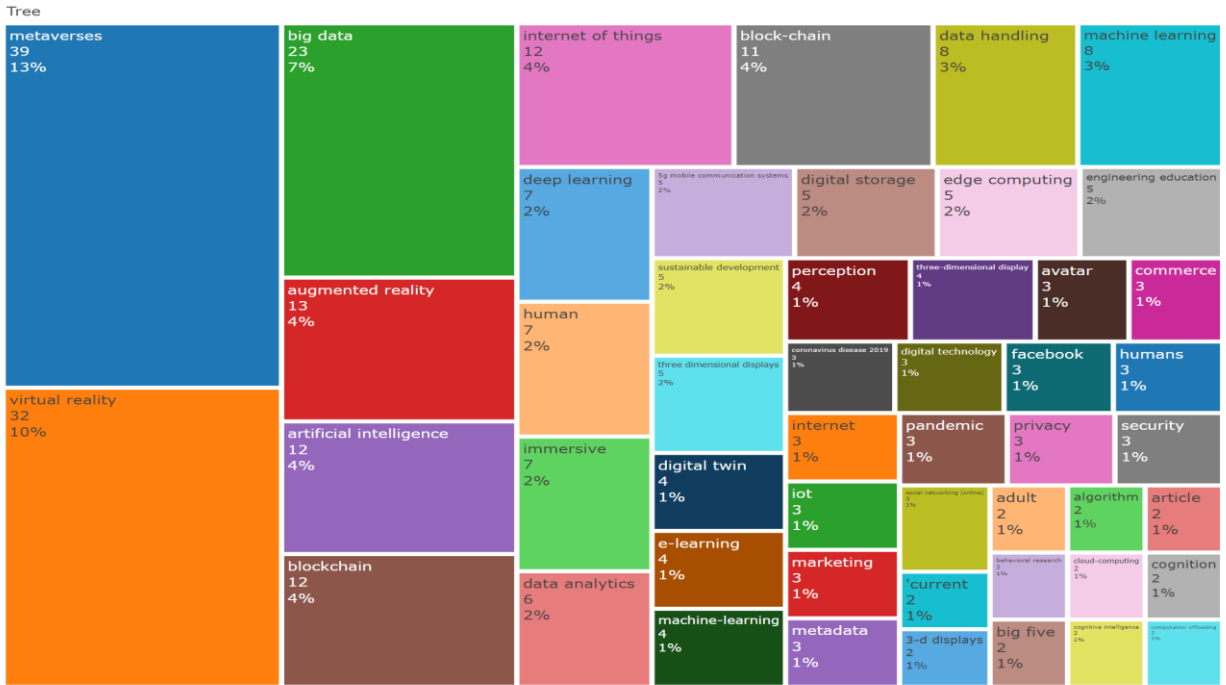


Fig. 9. Metaverse in Big Data TreeMap

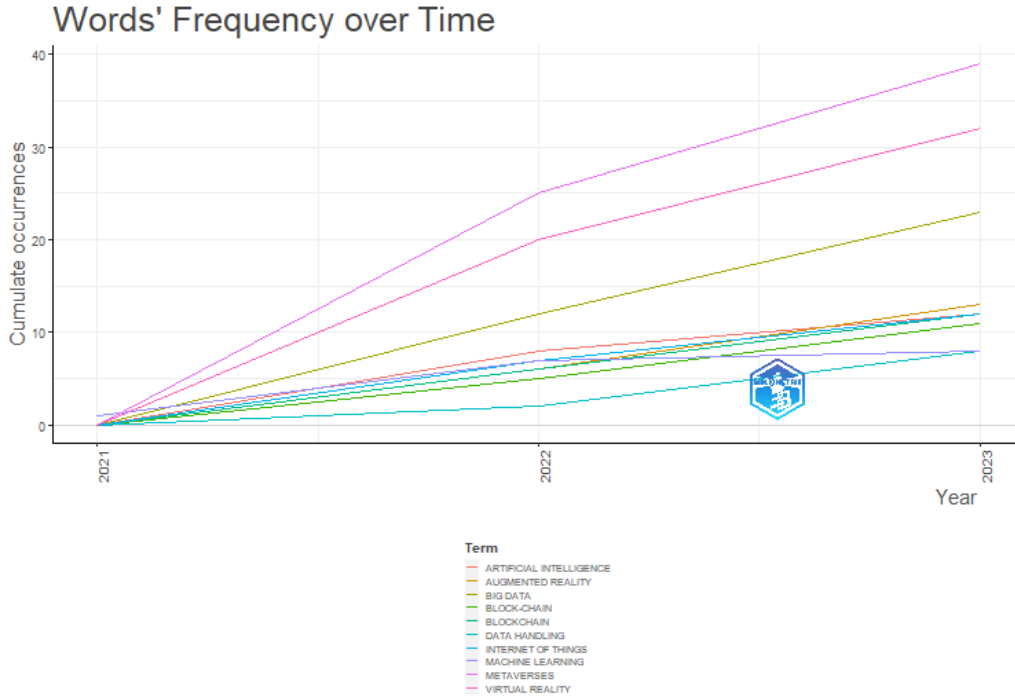


Fig. 10. Words' Frequency over Time

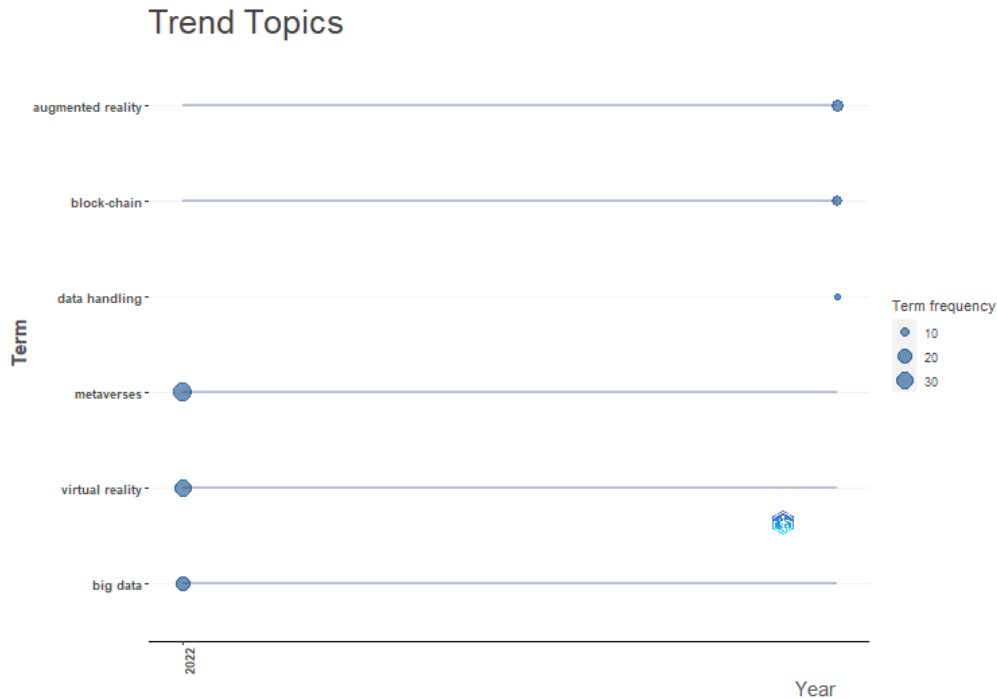


Fig. 11. Trend Topics

4. CONCLUSION

This bibliometric study of big data and the metaverse has shed light on some important patterns and ideas that are shaping our collective understanding of this emerging and fast developing topic. As we wrap up this research, we consider the most important lessons that may be used in the classroom and the workplace. To begin with, the metaverse has developed into a multidisciplinary field, where experts from several fields work together to investigate its many facets. Because of its cross-disciplinary character, the metaverse has spawned a plethora of conferences, journals, and publications, each of which provides a distinct take on the subject's implications, applications, and challenges. Our research has uncovered a group of prolific and prominent writers whose works have had a significant impact on the development of this field of study. These writers' dedication to bridging disciplinary boundaries in the study of the metaverse's relationship to big data is inspiring. We have found that research in the metaverse frequently crosses disciplinary and institutional barriers through our analysis of the networks of collaboration. Institutional and scholarly collaborations across regions and disciplines have increased the breadth and depth of the field and promoted the spread of new ideas and information. The fact that researchers from all across the world have contributed to metaverse studies is another proof of the field's widespread interest. Although some areas have emerged as centres of metaverse inquiry, the topic as a whole continues to draw scholars from all over the world. Metaverse studies cover a wide range of ever-evolving topics, reflecting the rapid pace of technological development and societal paradigm shifts. Because of this volatility, researchers and other stakeholders must be ready to adjust to new circumstances. All in all, this bibliometric study not only gives a bird's-eye view of metaverse research in big data, but also provides useful insights that might inform future studies and policy choices. We expect the interaction between virtual worlds and big data to produce breakthrough discoveries as the metaverse develops. In the age of big data, the metaverse presents both opportunities and challenges, and we hope that this analysis will be a go-to reference for scholars, politicians, and business leaders.

Conflicts of Interest

The author's paper explicitly states that no funding was received from any institution or sponsor.

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