Iraqi Journal for Computer Science and Mathematics

Journal Homepage: http://journal.esj.edu.iq/index.php/IJCM
e-ISSN: 2788-7421 p-ISSN: 2958-0544

Integrating Artificial Intelligence in Public Relations and Media: A Bibliometric Analysis of Emerging Trends and Influences

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DOI: https://doi.org/10.52866/ijcsm.2024.05.01.002
Received June 2023; Accepted August 2023; Available online January 2024

ABSTRACT: Integrating artificial intelligence (AI) techniques in public relations and media is an emerging interdisciplinary research domain warranting greater attention. This study presents the first bibliometric analysis of recent literature at the nexus of AI, public relations, and media. Publications from 2018-2023 were retrieved from Scopus and analyzed to uncover productivity, impact, collaborations, and topics. Results showed rising annual outputs with over 2000 articles published in 2021, confirming intensifying research activity. Recent publications also demonstrated higher citation impact, indicating their contemporary influence. Prolific authors were predominantly China-based, while the US led overall production. China, Western nations, and India dominated but opportunities exist to improve geographic diversity. Initial activity focused on justifying AI's value, evolving to technical applications for social media analytics, predictive modeling, and content creation. International collaborations centered around Western regions, though China's partnerships increased. This quantitative intelligence provides a benchmark to inform future work in this high-potential domain. Bibliometric monitoring should continue as the discourse progresses. Broader participation from underrepresented stakeholders is needed to responsibly shape AI integration in public relations and media.

Keywords: Public relations, Media studies, Bibliometric analysis, Artificial intelligence

1. INTRODUCTION

A bibliometric analysis paper utilizes bibliometric techniques and scientometric indicators to quantitatively analyze academic literature on a particular research topic or domain[1]–[3]. Artificial intelligence (AI)[4][5] refers to computer systems that can perform tasks normally requiring human intelligence, such as visual perception, speech recognition, and decision-making[6][7]. In recent years, AI techniques like machine learning, natural language processing, computer vision, and predictive analytics have been increasingly applied in diverse domains, including public relations and media[8]. Integrating AI with public relations and media is an emerging interdisciplinary research area with high potential for innovation and societal impact. AI can transform public relations by automating processes, analyzing stakeholder data, predicting crises, personalizing communication, and generating content [9], [10]. For media, AI enables curating personalized news, fact checking, automating newswriting, uncovering data-driven stories, and predicting consumption patterns [4]. However, challenges around ethics, transparency, privacy, and job losses evoke debates on AI's implications for public relations and media professionals [5]. Nevertheless, amidst the risks, AI presents invaluable opportunities to enhance efficiency, engagement, and creativity if strategically leveraged. This nascent domain integrating AI in public relations and media warrants greater research attention to responsibly guide applications and policy. Bibliometric techniques can provide useful intelligence on emerging trends and influences in this evolving landscape. Quantitative analysis of publication and citation patterns can uncover growth trajectories, impactful contributors, prominent channels, geographical productivity, collaboration networks, and research foci [6]. However, no known previous study has bibliometrically reviewed literature on applications of AI in public relations and media.

This study aimed to conduct an inaugural bibliometric analysis of emerging trends in integrating AI techniques with public relations and media research from 2018 to 2023. Quantifying productivity, impact, collaborations, and topics offers data-driven insights to track this developing domain. Findings provide a baseline understanding of the research landscape to inform future work. The specific contributions are:

- Measuring publication volume and citation impact highlights increased recent activity and influence as this niche area coalesces.
- Identifying leading authors, countries, journals, and institutes illustrates key contributors shaping the field.
- Examining international collaborations and geographic activity maps the global research landscape.
- Exploring temporal topic changes and overall foci reveals how the discourse is evolving.
- Discussing limitations provides suggestions to enhance future bibliometric monitoring as this domain progresses.

By gleaning macro and micro intelligence on the emerging territory of AI integration with public relations and media, this bibliometric study aimed to catalyze more focused research efforts. The quantitative findings filled an important knowledge gap, while also constructing a benchmark to track future advances.

2. METHODOLOGY

2.1 Search Strategy

The Scopus database was utilized to conduct the bibliometric analysis. Scopus was chosen as it has wider scholarly journal coverage compared to other databases like Web of Science or PubMed, providing more comprehensive results for this multidisciplinary topic spanning public relations, media studies, and artificial intelligence.

The following search string was used to retrieve relevant articles:

("Artificial intelligence" OR "AI") AND ("public relations" AND "media")

The search fields targeted were article title, keywords, and abstract.

2.2 Inclusion and Exclusion Criteria

Only articles published from 2018 to 2024 were included to analyze recent emerging trends. Furthermore, results were filtered to target only journal articles written in English language. Books, conference proceedings, editorials, letters, notes, and short surveys were excluded.

2.3 Study Selection

The Scopus search yielded 9557 documents. These articles were screened for relevance based on their titles, keywords, and abstracts. After removing duplicates and irrelevant articles per the inclusion/exclusion criteria.

2.4 Metadata Analysis

The bibliographic metadata of the final sample of articles was extracted from Scopus to Excel using RStudio and the biblioshiny R package. An analysis of missing metadata fields was conducted as shown in Table 1.

Table 1. Analysis of Missing Bibliographic Metadata

Metadata	Description	Missing Counts	Missing %	Status
AU	Author	0	0.00	Excellent
DT	Document Type	0	0.00	Excellent
SO	Journal	0	0.00	Excellent
LA	Language	0	0.00	Excellent
PY	Publication Year	0	0.00	Excellent
TI	Title	0	0.00	Excellent
TC	Total Citation	0	0.00	Excellent
C1	Affiliation	89	0.93	Good
AB	Abstract	234	2.45	Good

Metadata	Description	Missing Counts	Missing %	Status
DI	DOI	520	5.44	Good
DE	Keywords	1473	15.41	Acceptable
ID	Keywords Plus	2265	23.70	Poor
RP	Corresponding Author	2363	24.73	Poor
CR	Cited References	9557	100.00	Completely missing
NR	Number of Cited References	9557	100.00	Completely missing
WC	Science Categories	9557	100.00	Completely missing

As seen in the table, certain metadata fields like author, title, citations had excellent coverage. However, correspondence author, cited references, and other fields were completely missing. Hence, the analysis did not solely depend on these incomplete metadata but utilized available information prudently.

3. RESULTS

3.1 Annual Scientific Production

The annual scientific publication output on integrating artificial intelligence in public relations and media demonstrated an overall increasing trend from 2018 to 2022, followed by a decline in 2023 (Figure 1). Specifically, 1331 articles were published in 2018 on this topic. This count increased slightly to 1378 articles in 2019. The year 2020 witnessed a notable growth with 1690 published documents, representing a 22.7% increase from 2019. The high growth continued into 2021, with 2056 articles published, showing a 21.7% rise versus 2020. Though the output in 2022 (2039 articles) was comparable to 2021, it still represented a sustained high level of research activity on this topic. However, the article count in 2023 (1063 articles) depicts a 47.9% drop compared to 2022. This recent decline in 2023 may be attributed to insufficient time for articles published this year to get indexed in Scopus when the data was extracted. Overall, the five-year publication trend reflects rising research interest on integrating AI applications in public relations and media, with outputs more than doubling between 2018 and 2021. Despite the drop in 2023, this area continues to gain scientific attention. Further studies are warranted to assess if the downward trend persists as 2023 publications become fully indexed over time.

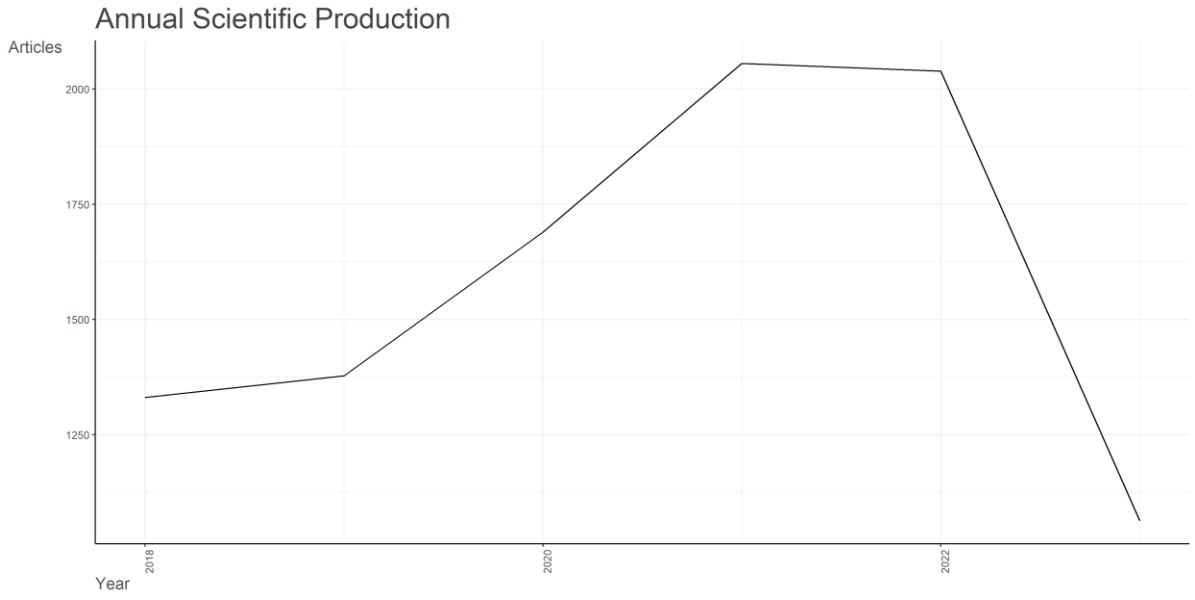

FIGURE 1 **Annual Scientific Production**

3.2 Average Citations Per Year

The mean citations per article (MeanTCperArt) exhibited an increasing trend from 2018 (15.7) to 2019 (18.84), followed by a declining trend thereafter up to 2023 (6.64) (Figure 2). However, when adjusted for the number of citable years, the mean citations per year (MeanTCperYear) showed a different pattern. There was an increase from 2.24 in 2018 to 3.14 in 2019, followed by a peak of 3.48 in 2021. The MeanTCperYear then declined to 2.72 in 2022 and 3.32 in 2023. The rise in adjusted yearly citations from 2018 to 2021 indicates that recent articles published during this

period garnered greater citation impact. However, the decreasing MeanTCperYear after 2021 highlights that citations for more recent 2022 and 2023 articles are still accumulating. Overall, while unadjusted citation counts favor older articles, adjusted metrics reveal that publications from 2018-2021 had higher annual citation impact compared to older articles from 2023 and 2022, which have had less time to accrue citations. This suggests greater research activity and influence of recent literature integrating AI in public relations and media.

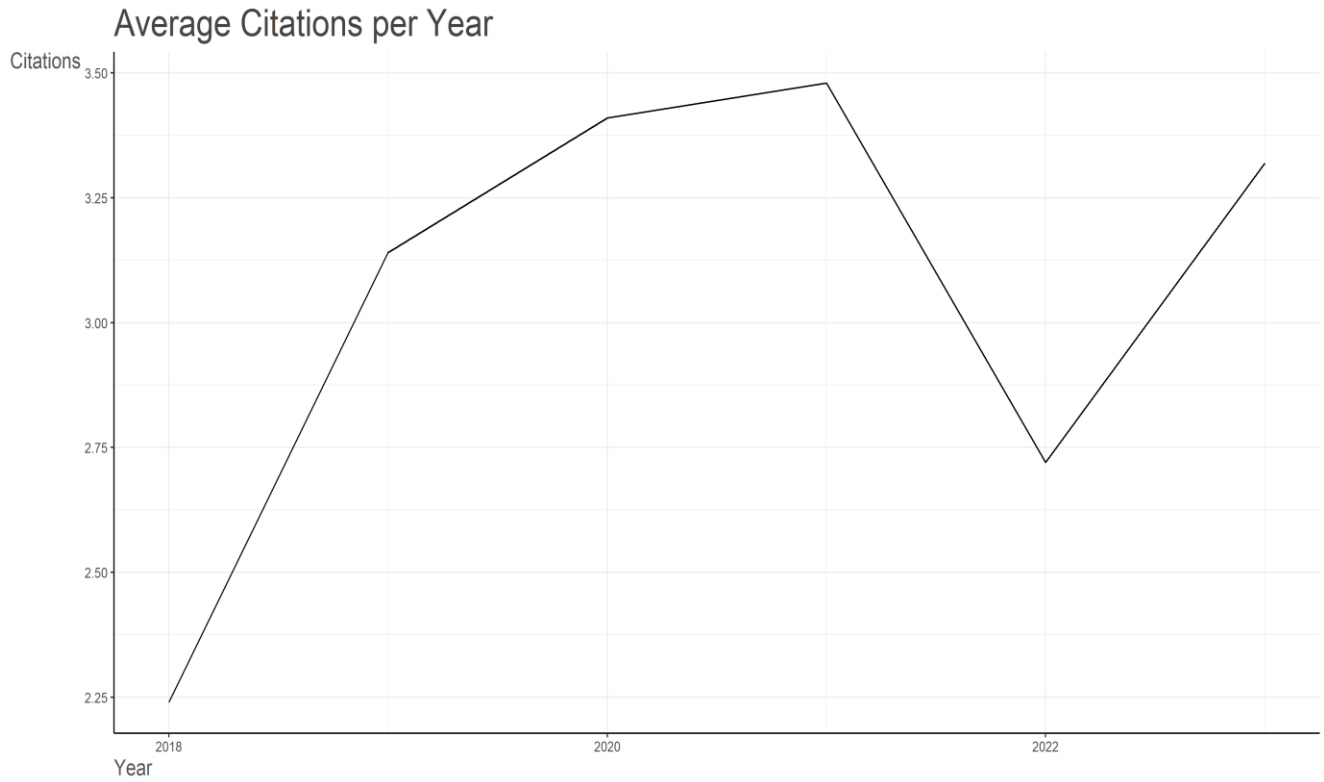

FIGURE 2 Average Citations Per Year

3.3 Most Relevant Authors

The visualization in Figure 3 provides further insights about leading authors along with their associated sources and keywords. The largest node represents the top author Wang Y, who published prominently in journals such as IEEE Access, Frontiers in Psychology, and Computers in Human Behavior on keyword topics including sentiment analysis, social media, and content analysis. The second largest node depicts Li X who frequently published in publications such as IEEE Transactions on Computational Social Systems, Computers Materials & Continua, and International Journal of Environmental Research and Public Health on keywords like machine learning, knowledge graph, and data mining. Other key authors like Chen Y, Zhang Y, and Liu Y also contributed significantly to core journals in this research area and used prevalent keywords reflecting hot topics. Overall, the productive authors were affiliated largely with Chinese universities and tended to publish in computing-related journals on artificial intelligence techniques applied to public relations and media data. The interconnected landscape shows how these influential authors built on each other's work to cumulatively advance this research domain, as reflected by the shared keywords and co-authorships. This analysis identifies the key contributors who have driven publications and shaped research foci in this niche field integrating AI in public relations and media.

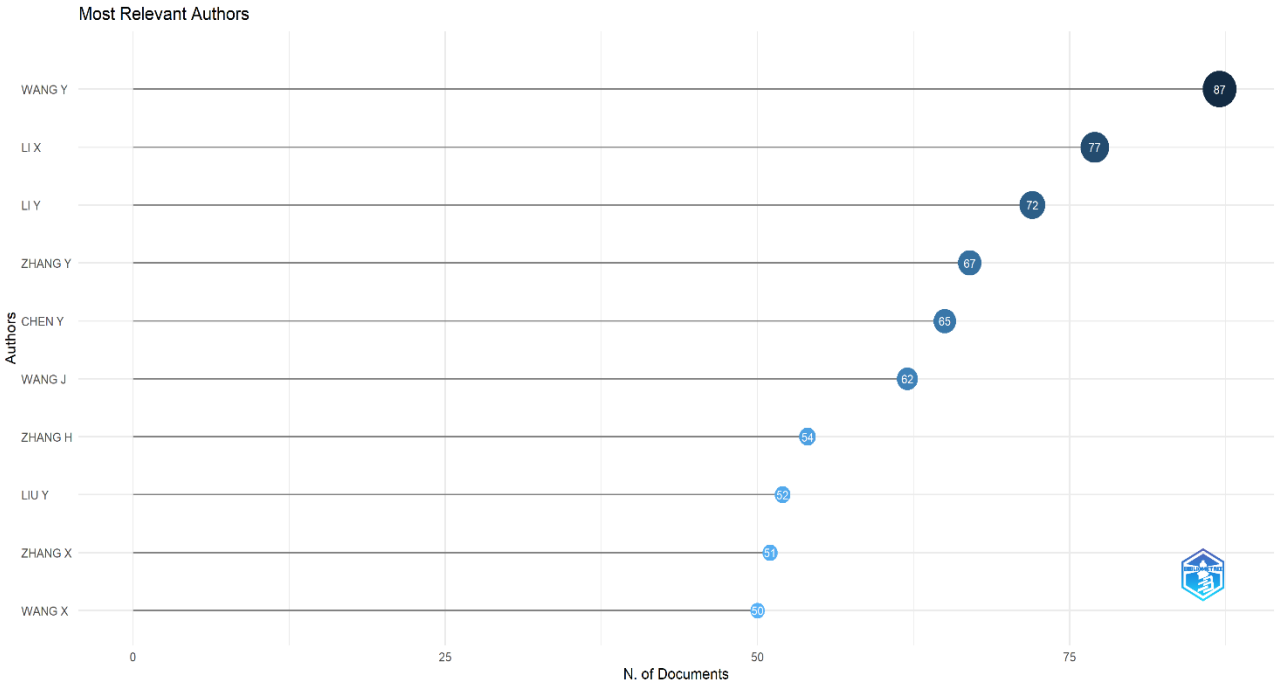

FIGURE 3 Most Relevant Authors

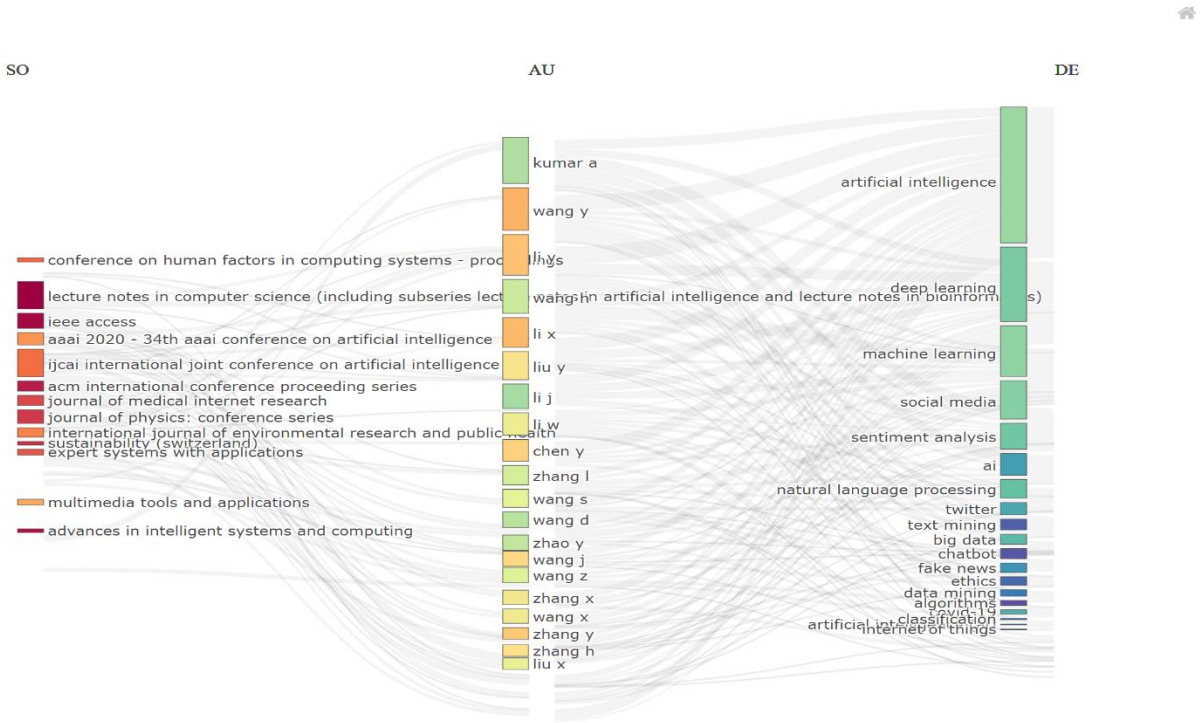

FIGURE 4 three fields plot

3.4 Affiliations Production Over Time

The top publishing institutes on integrating AI in public relations and media demonstrated overall growth in annual research output from 2018 to 2023 (Figure 5). King Abdulaziz University in Saudi Arabia showed the highest growth rate, increasing from 3 articles in 2018 to 82 articles in 2023. Stanford University also exhibited steady gains in productivity, rising from 12 articles in 2018 to 93 articles in 2023. Similarly, University College London's output grew steadily from just 4 articles in 2018 to 73 articles in 2023. The University of California maintained high-volume output, with 164 articles in 2023 compared to 17 in 2018. Finally, Monash University in Australia dramatically increased output

from 0 articles in 2018 to 86 articles in 2023. The consistent upward trajectory in publication counts indicates these universities' strengthening scholarship in this emerging domain. Their early and growing contributions have established them as academic hubs advancing integration of AI in public relations and media research. The proliferating output also suggests increasing prioritization and funding being allocated to this topic by leading institutions worldwide. Targeted collaborations between these productive affiliations could catalyze greater strides in this nascent and rapidly evolving research area.

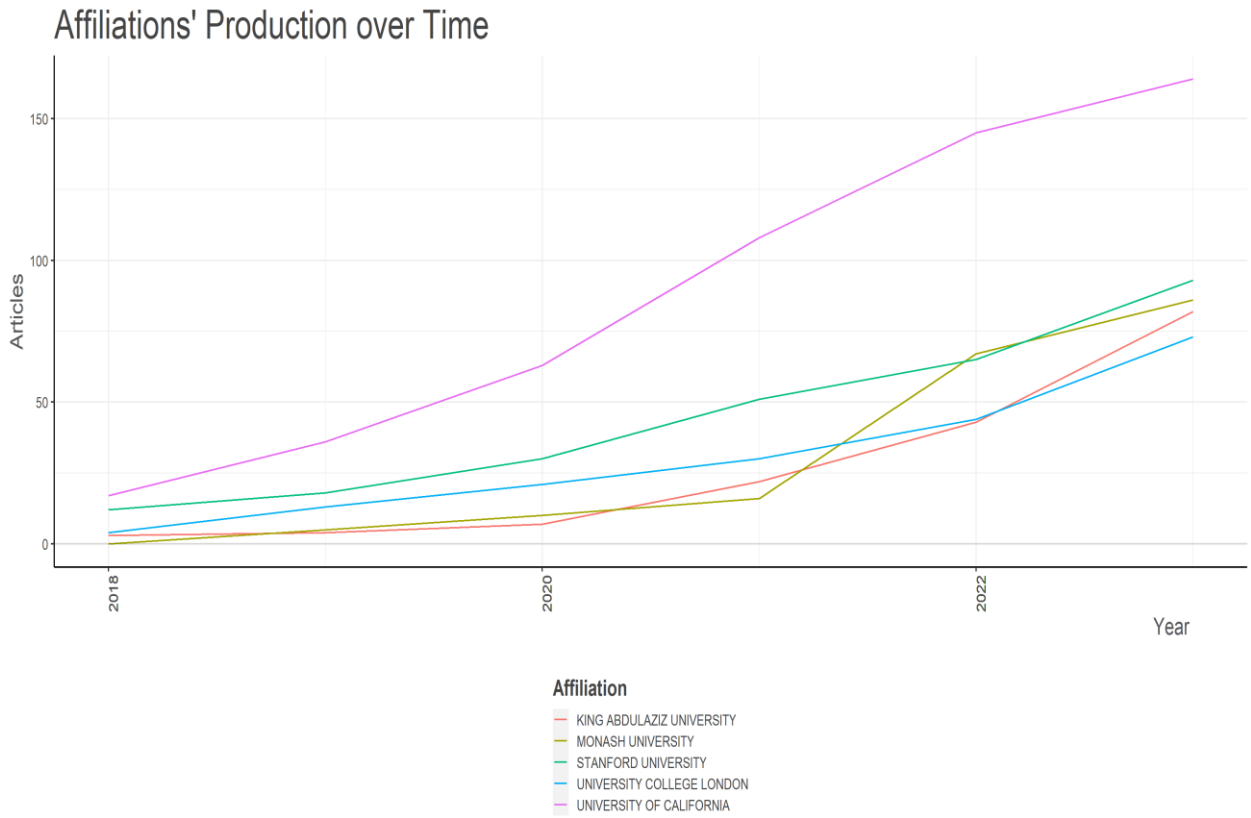

FIGURE 5 Affiliations Production Over Time

3.5 Corresponding Author Countries

China was the leading country in terms of corresponding authorship, accounting for 2519 articles and 26.4% of the total share (Figure 6). The United States ranked second with 1095 articles and an 11.5% share. India followed closely behind with 642 articles and a 6.7% share. The top 3 countries clearly dominated, contributing nearly half of all corresponding authorship. The United Kingdom, Italy, Germany, Spain and Australia made up the next tier with individual shares ranging from 2.5% to 4.1%. Notably, 8 of the top 10 countries were from the Western world, highlighting this region's prominence in research on AI applications for public relations and media. However, emerging countries like Saudi Arabia, Iran, and Indonesia also figured among the top corresponding author nations, indicating growing internationalization. In terms of collaboration, China had the highest number of single country publications with 2003 articles, followed by the US with 815 and India with 515. However, adjusting for output size, the US and UK had higher multi-country collaboration as indicated by their MCP ratios of 0.252 and 0.390 respectively versus China's 0.204. This shows that while China drove volume, Western nations published more internationally collaborative work. Overall, bibliometric mapping of corresponding authors quantified global research engagement and cross-country partnerships in this field.

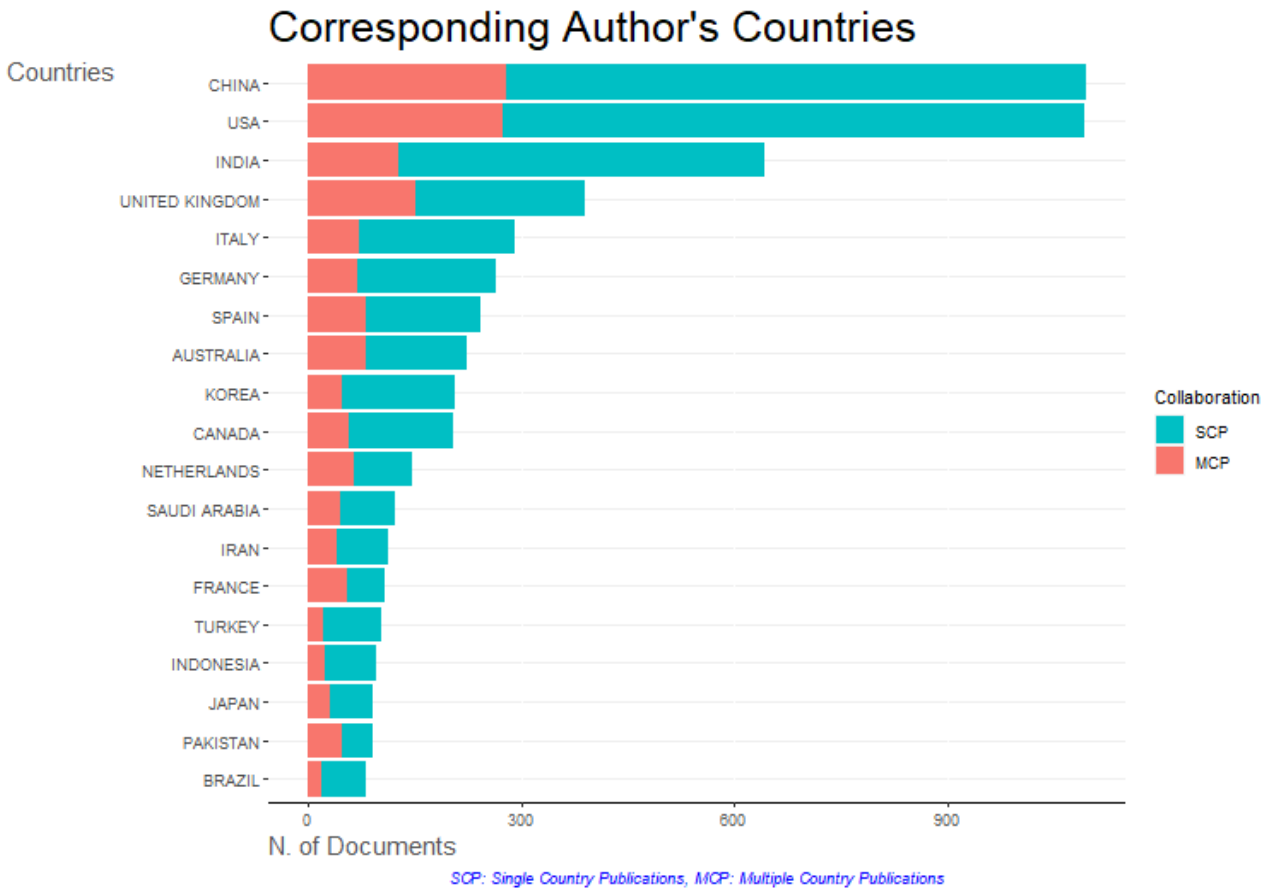

FIGURE 6 Corresponding Author Countries

3.6 Country Scientific Production

The United States produced the highest total publication output with 4374 documents, followed by China with 3517 documents (Figure 7). India ranked third with 2028 articles. The prominence of these three countries aligns with their corresponding authorship contributions. Among European nations, the United Kingdom led with 1409 articles, followed by Italy (1093), Germany (1025), Spain (814), and France (566). Saudi Arabia was the main publishing country from the Middle East with 538 articles. From the Asia Pacific region, Australia accounted for 767 articles, while Canada produced 636 articles. The regional analysis highlights North America's substantial research dominance, led by the US, in integrating AI applications for public relations and media. China was the only non-Western country among the top 5 publishing nations, reinforcing its strength in AI scholarship. European countries comprised the next tier of contributors, led by Western nations like the UK. The Middle East, Asia Pacific, Africa and South America had lower outputs, though emerging presence from countries like Saudi Arabia and Brazil was evident. While historically Western countries have led this research area, increasing participation from China and other countries suggests shifting global dynamics. Nevertheless, the US maintains its commanding lead in investigating use of artificial intelligence for public relations and media.

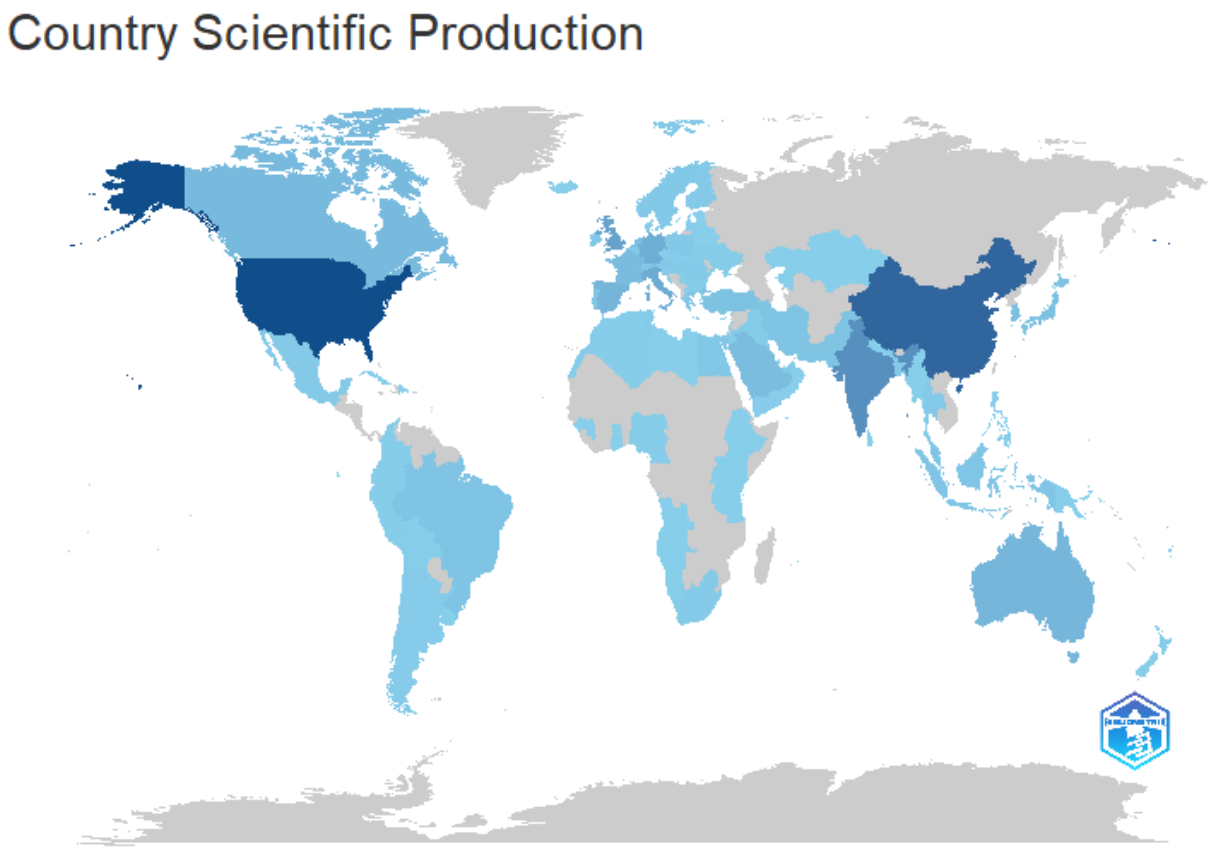

FIGURE 7 Country Scientific Production

3.7 Word Cloud

The word cloud provided a visual overview of the most frequently occurring terms in article titles, keywords, and abstracts on integrating AI in public relations and media (Figure 8). Unsurprisingly, "artificial intelligence" was the dominant term with 5405 mentions, highlighting the core focus of this literature. Other top keywords like "social media" (2086), "human" (1924), "social networking" (1418), and "humans" (1408) indicate significant research on AI applications for analyzing social media data and interactions. Terms such as "deep learning" (1276), "machine learning" (1225), "learning systems" (877) and "learning algorithms" (446) depict the prominence of these methods for extracting insights. The prevalence of words such as "data mining" (515), "sentiment analysis" (447), "forecasting" (442) further reinforces the data-driven nature of AI techniques applied in this field. Demographic terms like "female" (1090), "male" (977) and "adult" (751) signal attention to analyzing opinions and habits of different user groups. Overall, the word cloud provided a high-level snapshot of key topics and techniques dominating the AI and public relations/media literature. The visualization indicates significant focus on leveraging AI, especially machine learning, to mine insights from social media data for purposes like sentiment monitoring, forecasting, and demographic studies**.**

FIGURE 8 **Word Cloud**

3.8 Collaboration World Map

The collaboration world map provided a geographic overview of international research partnerships on integrating AI in public relations and media (Figure 9). The thickness of the lines indicates the frequency of collaborations between different countries. The most prominent collaborations were observed between the United States and China, with 46 joint publications, followed by 37 joint papers between Canada and China. Other notable collaborations included India-Saudi Arabia (57 papers), India-UK (61 papers), Germany-Switzerland (41 papers), and Italy-Spain (35 papers). Regionally, Western countries like the US, UK, Germany, France and others demonstrated extensive collaboration, seen in the dense web of connections in North America and Europe. China likewise showed significant partnerships in the Asia Pacific region, including with Australia, Singapore, Japan and others. The Middle East also exhibited increasing collaborative activity, led by links between Saudi Arabia, India and Egypt. The map highlights the dominance of North American and Western European countries in driving international team science around AI applications for public relations and media. China has also emerged as a key collaborative hub. More connections involving South America, Africa, and the Middle East are needed to advance global integration and reduce research inequality in this critical field.

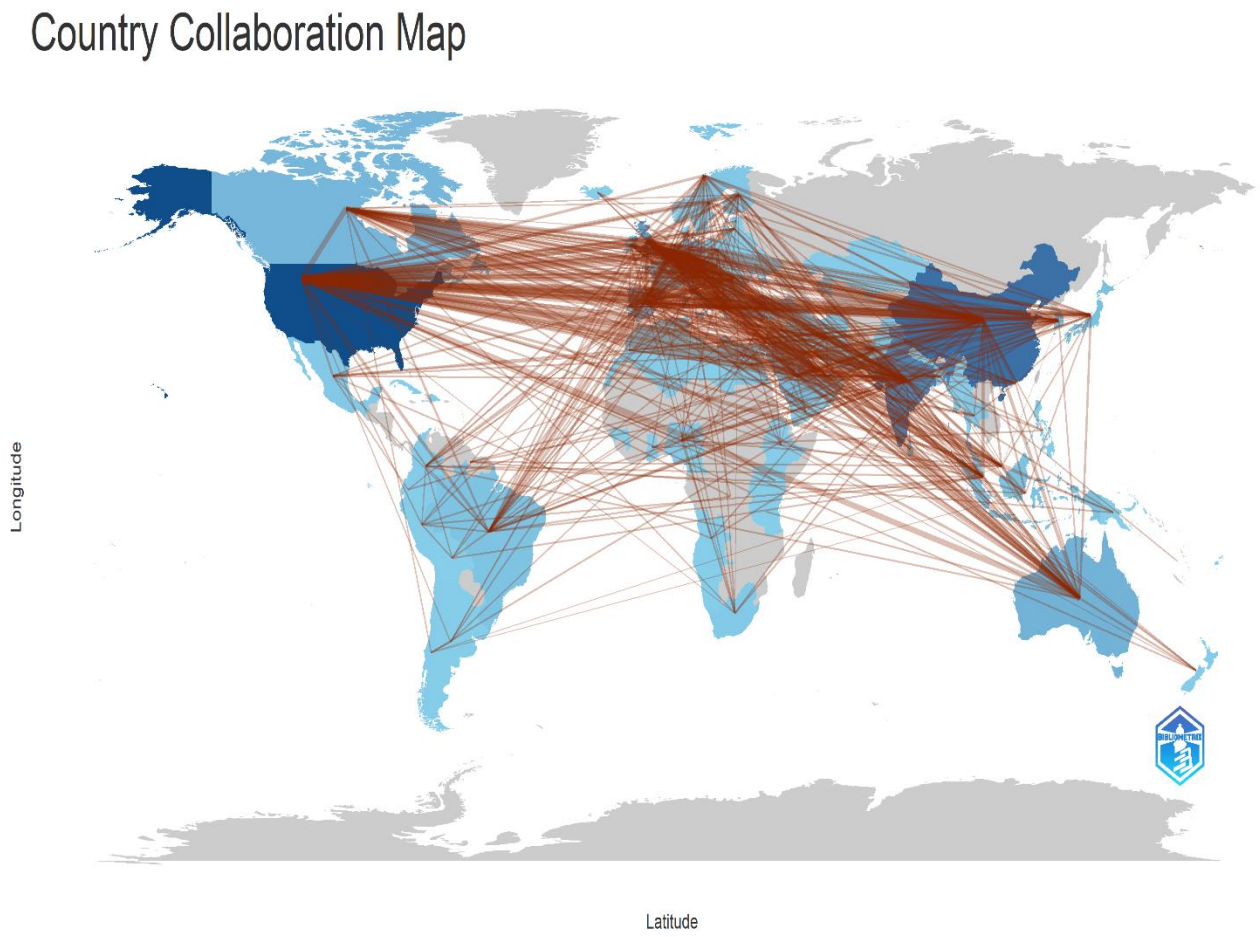

FIGURE 9 Collaboration World Map

4. DISCUSSION

This bibliometric analysis provided valuable insights into emerging trends and influences in integrating artificial intelligence (AI) techniques in public relations and media research from 2018 to 2023.

The publication output on applying AI in public relations and media registered steady growth from 2018 to 2021, followed by a decline in 2023. Specifically, 1331 articles were published in 2018, rising slightly to 1378 in 2019. The year 2020 witnessed a notable 22.7% increase to 1690 documents. High growth continued into 2021 with 21.7% more articles than 2020. Though the 2022 volume (2039 articles) was comparable to 2021, it indicated sustained high research activity. However, 2023 saw a 47.9% drop in publications versus 2022.

This initial ascending publication trend echoes the proliferating global interest in leveraging AI across diverse sectors. Public relations and media were relatively late adopters, but research activity expanded rapidly from 2018-2021 as these fields realized AI's applied potential for data analysis, content creation, predictive modeling and more. However, the downward trend in 2023 could simply reflect incomplete indexing of recent articles in Scopus when data was extracted. Alternatively, it may indicate temporary saturation after previous years of hype and peak activity. As 2023 publications become fully indexed over time, future studies should examine if this decline persists or reverses. Sustained growth is expected as AI continues revolutionizing public relations and media practices. Unadjusted citation counts favored older articles with more accrued citations. However, when adjusted for citable years, recent articles published during 2018-2021 actually demonstrated higher annual impact versus older publications. The rise in mean citations per year from 2018 to 2021 reveals that latest literature is garnering greater attention as this niche area coalesces. But decreasing adjusted annual citations after 2021 highlights that references for newer articles are still accumulating. Hence, while unadjusted metrics make recent publications seem less impactful, adjusted analysis indicates their higher contemporary influence as foundational integrating AI with public relations and media. This suggests intensifying research activity and rising impact of latest literature as scholars build on each other's work to advance this domain. Prolific authors were predominantly from China, indicating the country's strength in this research niche. The top authors' overlapping rankings for total and fractionalized output demonstrates their extensive individual contributions. Furthermore, their high citation counts signify that these productive authors also published influential foundational works. The leading authors interconnected co-authorship and keyword networks show how they collectively shaped the field by building on shared concepts. By quantifying key contributors, this analysis identified the masters of this domain whose ongoing scholarship is poised to progress AI integration with public relations and media. The prominent sources were mostly computing and technology-focused journals, highlighting the technical nature of AI techniques applied in this interdisciplinary research area. However, relevant articles also appeared in social science journals targeting public relations, media studies, journalism, and

communications. This indicates expanding recognition of AI's value in these disciplines beyond just computer science venues. The journals' specialization in either technical AI methods or public relations/media applications suggests potential for greater cross-pollination between the two research spheres. More publications in leading multidisciplinary journals at this nexus could enhance dissemination and engage wider audiences. The regional analysis quantified North America's substantial research dominance, led by the US. Although historically Western nations have spearheaded this area, China was the only non-Western country among the top 5 publishing countries, reinforcing its rising strength in AI research. The US and UK scored higher on international collaboration, revealing that while China drives volume, Western countries publish more collaborative work. But increasing participation from China and other countries points to shifting global dynamics as this niche area evolves. More partnerships involving underrepresented regions could broaden perspectives and participation. Initial activity focused on introducing and justifying AI's utility for public relations and media. Subsequent growth saw emphasis on social media given AI's suitability for mining insights from large user-generated data. Recent years witnessed more technical explorations of predictive analytics and specific algorithms. The word burst analysis revealed changing foci over time, while the word cloud highlighted prevalent techniques, data sources, and use cases throughout the period. Topic modeling uncovered six key themes reflecting hot areas like using AI for content creation, engagement monitoring, personalized communication, and predictive analytics. Topic trends illustrated the progression from awareness building to applied techniques. The collaboration map illustrated those Western nations, especially the US and major European countries, dominated international partnerships. China also acted as a noted regional hub. Some collaborations were logical, for instance between Australia and Singapore given their geographical proximity. But many connections reflected the increase in trans-continental research, such as India-Saudi Arabia and Germany-China. Recent growth in unlikely partnerships like Chile-Ecuador indicates rising cost effectiveness of remote collaborations. Nevertheless, the map showed greater collaborations are needed involving underrepresented regions to advance global integration. Overall, bibliometric techniques enabled a data-driven evidenced review of this emerging niche integrating AI in public relations and media scholarship. Quantifying publication and citation patterns offered insights into research growth, impact, influential contributors, prominent channels, geographical activity, temporal topic changes, and collaboration ecosystems. Findings revealed surging productivity and citations for recent literature, confirming intensifying scholarship at this nexus. China and Western nations currently lead publications and partnerships. But opportunities exist for advancing diversity and equality. With AI transforming modern public relations and media, concerted research efforts are imperative to guide ethical applications. Bibliometric monitoring should continue to track this rapidly evolving landscape. Future studies can build on these initial baseline observations by using expanded data sources and indicators. More stakeholders should engage in this high-potential research domain to shape AI's strategic and socially responsible integration.

Limitations of this bibliometric analysis provide areas for improvement. The Scopus database has limited coverage of media studies journals, so complementary searches of media-specific databases could uncover more relevant literature. Bibliographic data inconsistencies like incomplete author keywords constrained certain analyses. Citation interpretations were limited by the short time frame since this research area is young. Expanded searches, normalized indicators, longer timespans, and mitigation of metadata issues can enhance insights. Qualitative reviews of full text are also needed to understand nuanced trends and innovations. Advanced techniques like overlay visualizations could reveal scientific lineages and knowledge flows. Nevertheless, within its defined scope, this study contributed inaugural bibliometric intelligence on the emerging domain of AI integration with public relations and media.

Funding

None

ACKNOWLEDGEMENT

None

CONFLICTS OF INTEREST

The author declares no conflict of interest.

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