Original Article
ISSN (Online): 2582-7472

ShodhKosh: Journal of Visual and Performing Arts
May 2024 5(5), 313–324

DIGITAL TOOLS AND HISTORICAL INQUIRY: A BIBLIOMETRIC STUDY OF DIGITAL HISTORY RESEARCH

Ashok Kumar D[1]

[1] Assistant Professor of History, Government College, Kottayam

ABSTRACT

This bibliometric study explores the evolving field of digital history, focusing on its scholarly trends, key contributors, and thematic developments. Digital history involves the study and presentation of historical narratives using digital tools and technologies to enhance interpretation, collaboration, and accessibility. The analysis uses data from the Scopus database, processed with Biblioshiny and VOSviewer software, to examine 458 documents spanning 1998–2024. Key findings include annual scientific production trends, identification of the most relevant authors, and analysis of prominent sources such as Lecture Notes in Computer Science and CEUR Workshop Proceedings. A three-field plot illustrates the relationships between sources, authors, and keywords, highlighting the interdisciplinary nature of the field. Thematic analysis using a thematic map and keyword co-occurrence network categorizes topics into foundational, emerging, niche, and motor themes, revealing methodological innovations such as text mining and data visualization. Bibliographic coupling and co-authorship analyses showcase collaborations among researchers and nations, emphasizing the global and collaborative nature of digital history. The study identifies gaps in foundational theoretical development, the limited integration of niche themes, and the underutilization of computational methodologies across subfields. Practical implications include recommendations for strategic resource allocation, curriculum development, and the creation of user-friendly digital tools for historians. Overall, this research provides a comprehensive overview of the field's current landscape and suggests pathways for its future growth and interdisciplinary integration.

DOI
10.29121/shodhkosh.v5.i5.2024.3711

Funding: This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

1. INTRODUCTION

Digital history is the intersection of historical inquiry and digital technology, representing a transformative approach to how history is studied, taught, and disseminated [1], [2], [3]. Traditionally, history relied on physical archives, printed materials, and in-person collaborations, limiting the scope and accessibility of historical research [4]. However, the digital revolution has reshaped these practices, enabling historians to access vast datasets, digitized archives, and interactive tools that broaden the horizons of historical scholarship [1], [5]. This evolution is not merely technological; it reflects a paradigm shift in how we conceptualize, analyze, and engage with the past [6], [7].

The field of digital history employs a range of digital tools and methodologies, from data visualization and geographic information systems (GIS) to text mining and network analysis [8], [9]. These tools allow historians to uncover patterns and connections that would otherwise remain hidden in traditional analyses [8]. For instance, mapping the migration patterns of historical populations or visualizing trade networks over time offers new insights into historical dynamics

[10]. Such innovations have democratized access to historical knowledge, enabling collaboration across disciplines and fostering public engagement with history through interactive digital platforms and open-access archives [9], [11].

Despite its advantages, digital history is not without challenges. The reliance on digital technologies raises questions about data reliability, digital preservation, and accessibility [12], [13]. Digitization projects often exclude marginalized voices due to the unequal distribution of resources and existing biases in historical records [12], [14]. Moreover, the rapid pace of technological change creates issues of sustainability, as software and formats become obsolete [13]. Ethical concerns also arise regarding the use of personal or sensitive data from digitized records, necessitating critical frameworks to ensure inclusivity and integrity in digital historical practices [15].

Digital history is more than a methodological shift; it is a means of reimagining the past for contemporary audiences [16]. By integrating multimedia elements such as virtual reality and interactive storytelling, historians can create immersive experiences that bring history to life in compelling ways [17]. This approach not only enriches historical understanding but also makes history more accessible and engaging for diverse audiences, including students, researchers, and the general public [18]. As digital tools and technologies continue to evolve, the future of history lies in leveraging these innovations to foster a deeper connection between the past and the present [8], [19].

Digital history, as an academic discipline, has gained prominence with the integration of digital tools into historical research [20], [21]. By leveraging technologies such as digitized archives, data visualization, and computational analysis, digital history has transformed how historical data is analyzed and presented. As the field grows, researchers have increasingly turned to bibliometric analysis to explore trends, identify key contributors, and map the intellectual landscape of digital history [22]. Bibliometric tools like Biblioshiny and VOSviewer provide powerful frameworks for analyzing scholarly output, offering insights into publication patterns, citation networks, and thematic clusters within the discipline [23], [24].

Biblioshiny, an R-based application, and VOSviewer, a network visualization tool, are widely used in bibliometric analysis to uncover research trends and relationships [23], [23]. Biblioshiny facilitates descriptive and analytical visualizations, enabling researchers to examine metrics such as keyword co-occurrence, author productivity, and journal impact [25], [26], [27], [28]. VOSviewer complements this by creating detailed network maps that visualize connections between authors, institutions, and research topics [29], [30], [31], [32]. Together, these tools enable a deeper understanding of how digital history has evolved as a scholarly field, highlighting influential works, emerging themes, and gaps in the literature that warrant further exploration [24], [33].

Bibliometric analysis using Biblioshiny and VOSviewer not only sheds light on the development of digital history but also informs future research directions. By analyzing citation patterns and thematic trends, scholars can identify the foundational theories and methodologies driving the field. Moreover, these insights help bridge interdisciplinary gaps, encouraging collaboration between historians, computer scientists, and data analysts. As digital history continues to expand, bibliometric tools provide a systematic approach to evaluating its academic impact and ensuring its relevance in the broader landscape of digital humanities.

2. MATERIALS AND METHODS

In this study, Scopus was selected as the primary source of bibliographic data due to its extensive coverage of high-quality journals, providing a wider range of materials compared to other databases [34], [35], [36]. We conducted a search using specific keyword such as “Digital History”. The search was not restricted to any particular language, and the data included articles from peer-reviewed journals, book chapters, and conference papers. We collected 458 articles from 300 different sources, spanning 1998 to 2024. To ensure accuracy, we screened the Scopus records to remove any duplicates. The results were saved as a "CSV" file, and we performed bibliometric analysis on the data using VOSviewer version 1.6.19, and Bibloshiny software.

3. RESULTS AND FINDINGS

Critical Aspects of the Investigations

Table 1 provides an overview of the bibliometric analysis on digital history covering a 26-year period from 1998 to 2024. It includes a total of 458 documents from 300 different sources, demonstrating an annual growth rate of 10.98%. The average age of the documents is 5.46 years, suggesting that the research is fairly recent. On average, each document has received 4.714 citations, with a cumulative total of 15,858 references, indicating significant academic engagement in the field.The dataset contains 983 indexed keywords and 1,350 author-provided keywords, illustrating the thematic diversity of the field. Contributions involve 834 authors, with 197 single-author documents and an average of 2.2 co-

authors per document, highlighting a balance between independent and collaborative research. International collaborations make up 9.607% of the documents, suggesting moderate cross-border cooperation. The majority of publications are journal articles (306), complemented by book chapters (60) and conference papers (92), indicating varied dissemination formats.

Table 1. Critical aspect of the investigation

Description	**Results**
MAIN INFORMATION ABOUT DATA	
Timespan	1998:2024
Sources (Journals, Books, etc)	300
Documents	458
Annual Growth Rate %	10.98
Document Average Age	5.46
Average citations per doc	4.714
References	15858
DOCUMENT CONTENTS	
Keywords Plus (ID)	983
Author's Keywords (DE)	1350
AUTHORS	
Authors	834
Authors of single-authored docs	197
AUTHORS COLLABORATION	
Single-authored docs	227
Co-Authors per Doc	2.2
International co-authorships %	9.607
DOCUMENT TYPES	
article	306
book chapter	60
conference paper	92

Annual Scientific Production

Figure 1 demonstrates the annual scientific production in the field of digital history from 1998 to 2024, revealing a significant upward trend over time. Initial research activity was minimal, with sporadic publications during the early years, such as 2 articles in 1998 and no publications in 1999, 2002, and 2003. From 2011 onward, a consistent increase in output is evident, with a notable jump in 2011 to 11 articles. This upward trajectory accelerated further after 2015, reaching a peak of 59 articles in 2023, reflecting a growing interest and investment in this field. The recent decline to 30 articles in 2024 may be attributed to incomplete data for the year. Overall, the data highlights the evolving prominence of digital history as a research domain, with sustained growth in scholarly contributions over the past decade.

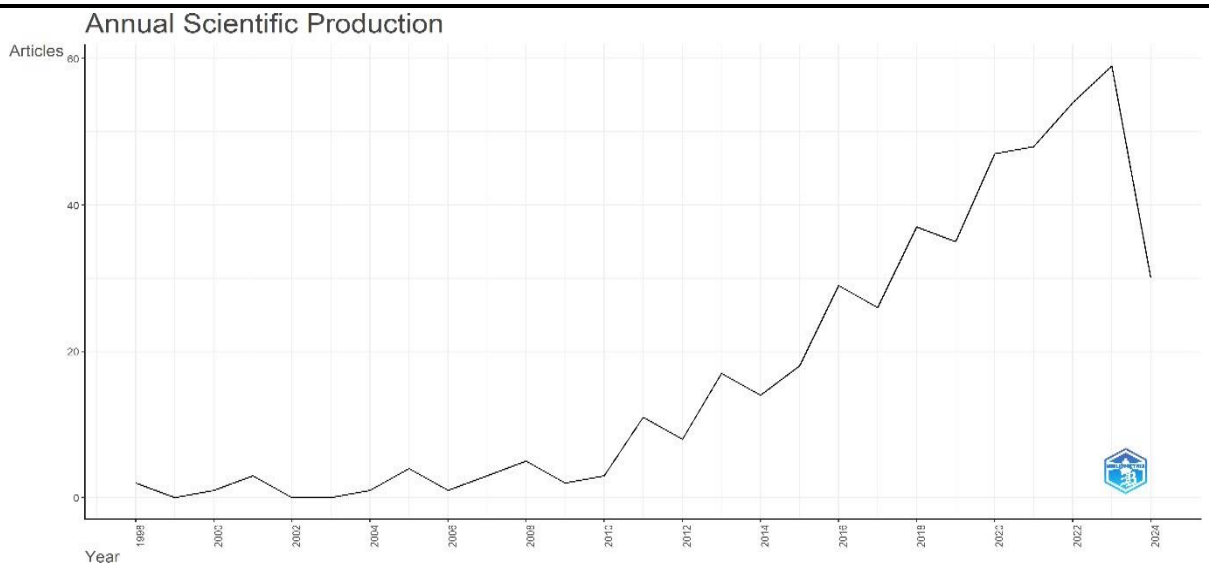

Figure 1. Publication trends in digital history research

Most Relevant Authors

Figure 2 presents the most relevant authors contributing to the field of digital history, with Adam Jatowt emerging as the most prolific author, contributing 11 articles. This highlights his significant role in advancing research in this domain. Christopher D. Green follows with 6 articles, reflecting his substantial contribution to the field. Ian Milligan and Yasunobu Sumikawa have each authored 5 articles, indicating their active involvement in shaping the discourse of digital history. Other authors, including Frederike Buda, Adam Crymble, Victor De Boer, Yijun Duan, Marten Düring, and Rik Hoekstra, have each contributed 4 articles. This data suggests a collaborative and growing scholarly community, with key individuals making notable contributions to the advancement of digital history.

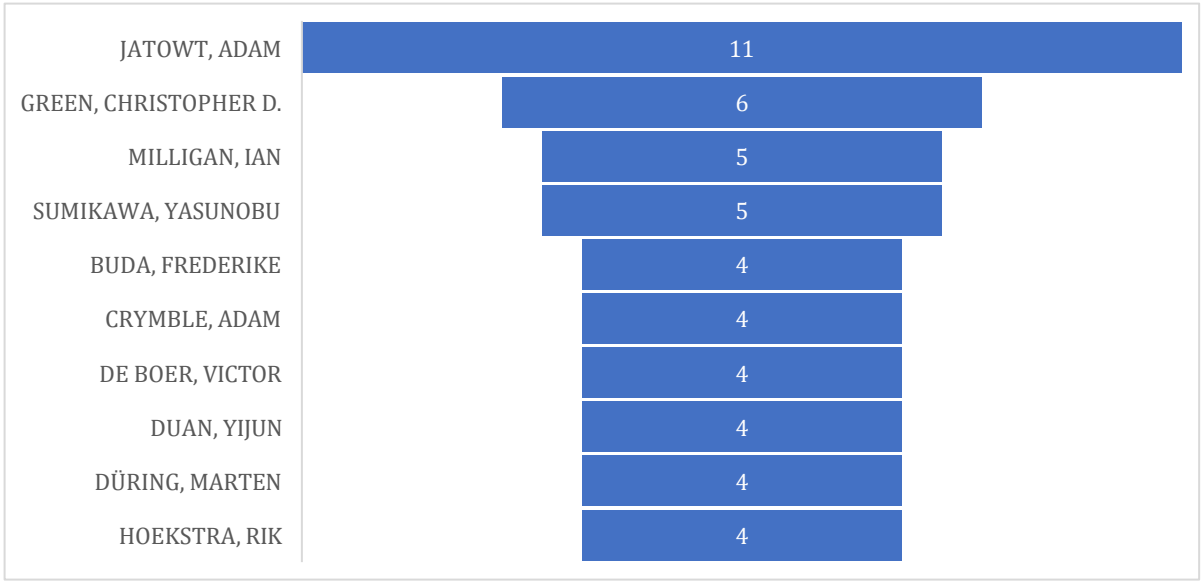

Figure 2. Most relevant authors

Most Relevant Sources

Table 2 lists the most relevant sources contributing to research on digital history. The Lecture Notes in Computer Science series stands out as the most significant contributor with 16 articles, reflecting the integration of computational methods into historical research. CEUR Workshop Proceedings follows with 11 articles, emphasizing its role in disseminating conference findings related to digital tools and history. History of Psychology (8 articles) and Handbook of Digital Public History (7 articles) highlight the interdisciplinary nature of digital history, connecting it to psychology and public

engagement. Several other sources, such as History and Theory, Journal of Sport History, Umanistica Digitale, and Zoomland, each contributing 6 articles, underscore the diversity of themes, ranging from theoretical approaches to digital humanities applications. Lastly, Internet Histories and Proceedings of the ACM/IEEE Joint Conference on Digital Libraries each provide 5 articles, illustrating the technological and internet-focused dimensions of this field. This variety of sources reflects the broad and multidisciplinary scope of digital history.

Table 2. Most relevant journals

Sources	Articles
LECTURE NOTES IN COMPUTER SCIENCE (INCLUDING SUBSERIES LECTURE NOTES IN ARTIFICIAL INTELLIGENCE AND LECTURE NOTES IN BIOINFORMATICS)	16
CEUR WORKSHOP PROCEEDINGS	11
HISTORY OF PSYCHOLOGY	8
HANDBOOK OF DIGITAL PUBLIC HISTORY	7
HISTORY AND THEORY	6
JOURNAL OF SPORT HISTORY	6
UMANISTICA DIGITALE	6
ZOOMLAND: EXPLORING SCALE IN DIGITAL HISTORY AND HUMANITIES	6
INTERNET HISTORIES	5
PROCEEDINGS OF THE ACM/IEEE JOINT CONFERENCE ON DIGITAL LIBRARIES	5

Three-Field Plot

Figure 3 illustrates the interconnected relationships between sources, authors, and keywords in digital history research. Prominent sources like *Lecture Notes in Computer Science* and *CEUR Workshop Proceedings* are central to disseminating research, often linked with influential authors such as Adam Jatowt, Ian Milligan, and Christopher D. Green. These authors contribute to diverse themes, showcasing their pivotal roles in advancing the field. The dominant keywords, including "digital history," "digital humanities," and "cultural heritage," highlight the field's focus on integrating technology into historical research, while terms like "data visualization," "distant reading," and "crowdsourcing" reflect methodological and collaborative priorities. This visualization underscores the interdisciplinary and collaborative nature of digital history, where a wide range of topics is explored across prominent journals and by key contributors.

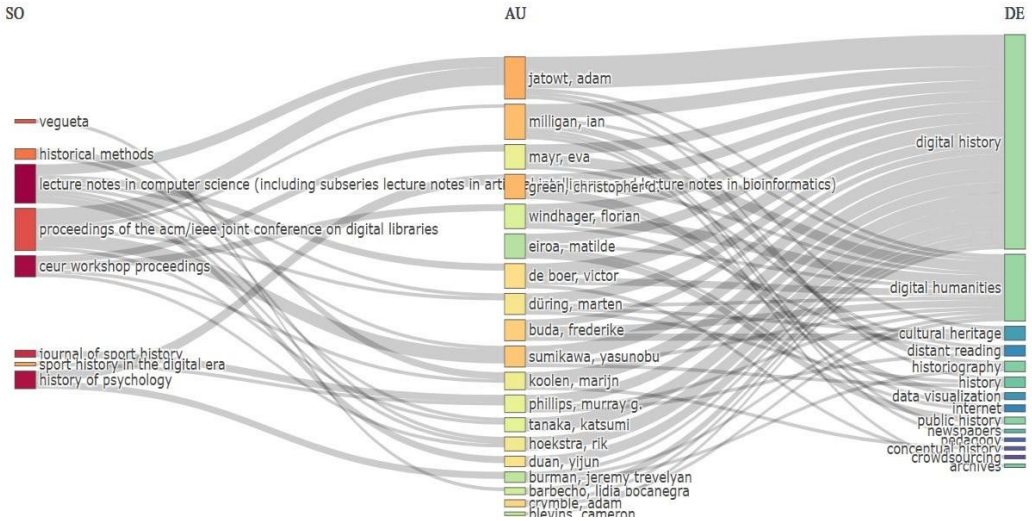

Figure 3. Interconnected relationships between sources, authors, and keywords

Trend Topics

Figure 4 depicts the trend topics in digital history research, illustrating how the prominence of various terms has evolved over time based on their frequency. Terms such as web archives, distant reading, and social media have gained consistent

attention in recent years, reflecting the increasing importance of digital tools and platforms in historical research. Core themes like digital history and digital humanities dominate the field, demonstrating their foundational role in this area of study. Emerging methodologies like text mining, data visualization, and crowdsourcing highlight the growing use of computational and collaborative approaches in historical analysis. Additionally, topics such as memory, oral history, and conceptual history underscore the continued focus on interpretive and thematic aspects of history. The sustained frequency of terms like archives and digitization suggests an ongoing interest in preserving and making historical materials accessible through digital means. This visualization provides a comprehensive overview of the field's dynamic development and its engagement with evolving technological and thematic trends.

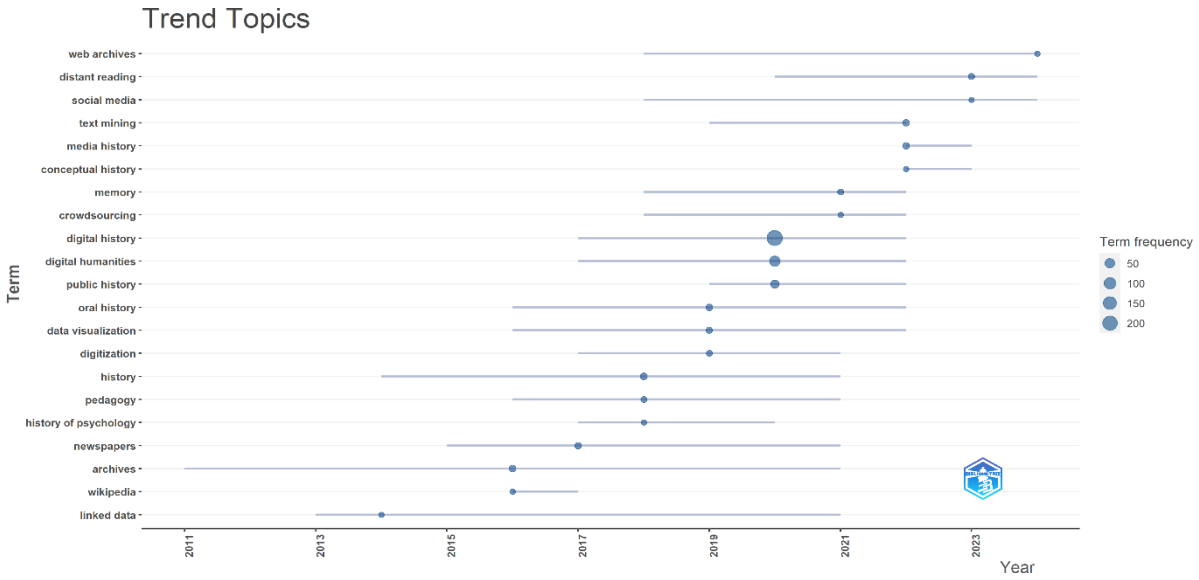

Figure 4. Evolution and trending topics in digital history

Thematic Map

Figure 5 illustrates the thematic map of digital history research, categorizing topics based on their development degree (density) and relevance (centrality). The map divides themes into four quadrants:

Motor Themes (High Centrality, High Density): These are well-developed and central to the field. Topics like data, microhistory, crowdsourcing, and digital hermeneutics fall here, indicating their importance as driving forces in digital history research. These themes combine methodological innovation with practical application.

Basic Themes (High Centrality, Low Density): Topics such as digital history, digital humanities, archives, and history are foundational but less developed in terms of complexity. These are essential for the field and widely applicable but may require further exploration to deepen their theoretical frameworks

Niche Themes (Low Centrality, High Density): Themes like game-based learning, conceptual history, and big data are specialized and highly developed but have limited broader impact or connections to other areas. These topics represent focused research areas that contribute depth to specific aspects of digital history.

Emerging or Declining Themes (Low Centrality, Low Density): Topics like history of psychology, digital historiography, and cultural heritage are either emerging areas of interest or declining in relevance. These themes may need renewed focus to remain significant or may represent niche studies.

The map provides a strategic overview of the research landscape, highlighting core areas like digital humanities and emerging trends such as crowdsourcing and microhistory, while also identifying areas that could benefit from further investigation or integration into the broader field.

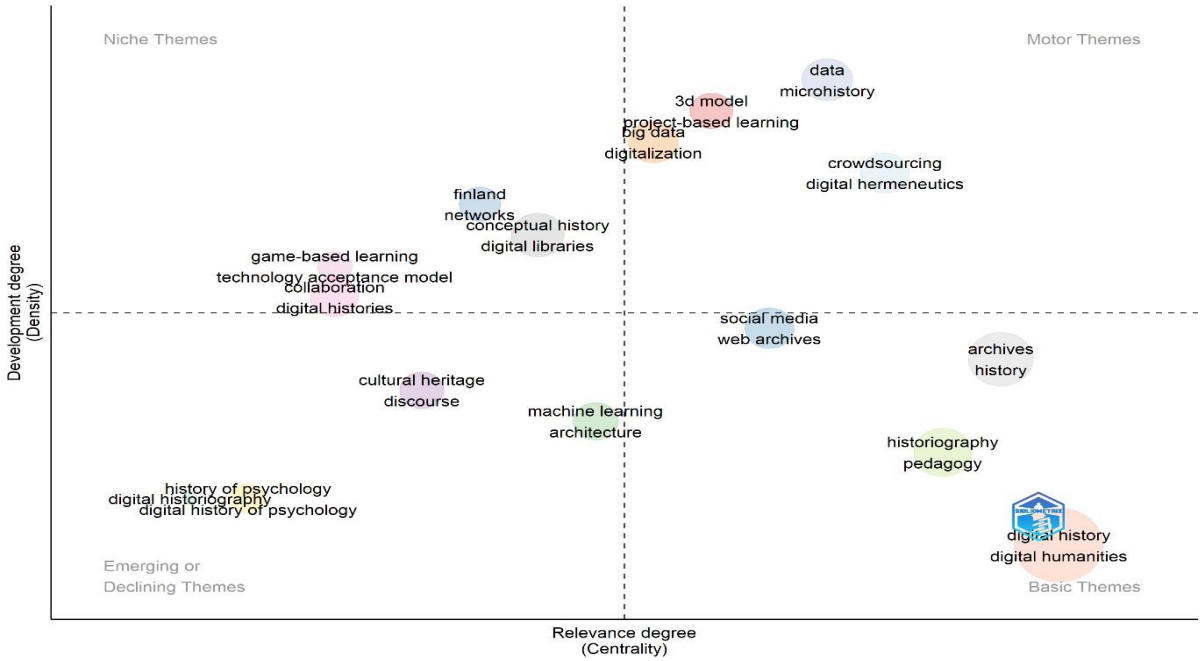

Figure 5. Thematic visualisation of keywords

Bibliographic Coupling of Documents

Figure 5 illustrates the bibliographic coupling network for digital history, visualized using a minimum citation threshold of 10. This method identifies relationships among documents based on shared references, and the resulting network consists of 39 items grouped into 9 clusters from an initial dataset of 458 documents. Each node represents a research document, and the size of the node indicates the document's significance in the network, often reflecting the number of shared references and citations. The connections (edges) between nodes demonstrate the degree of bibliographic coupling, with thicker edges indicating stronger relationships. Notable works such as Hitchcock (2013), Milligan (2016), and Brügger (2012) appear central in their respective clusters, highlighting their foundational role in the discourse on digital history. The clusters represent distinct thematic or methodological focuses in the field. For instance, Cluster 1 (red) may reflect a focus on historiography and theoretical frameworks, while Cluster 3 (blue) could emphasize archival practices or digital preservation. The interconnections across clusters suggest an interdisciplinary approach, with topics like digital humanities, crowdsourcing, and text mining overlapping between groups. This network highlights the collaborative and cumulative nature of research in digital history, showcasing how shared references underpin thematic cohesion and intellectual development within the field. It underscores the field's rich diversity and the foundational role of key works in shaping the discourse.

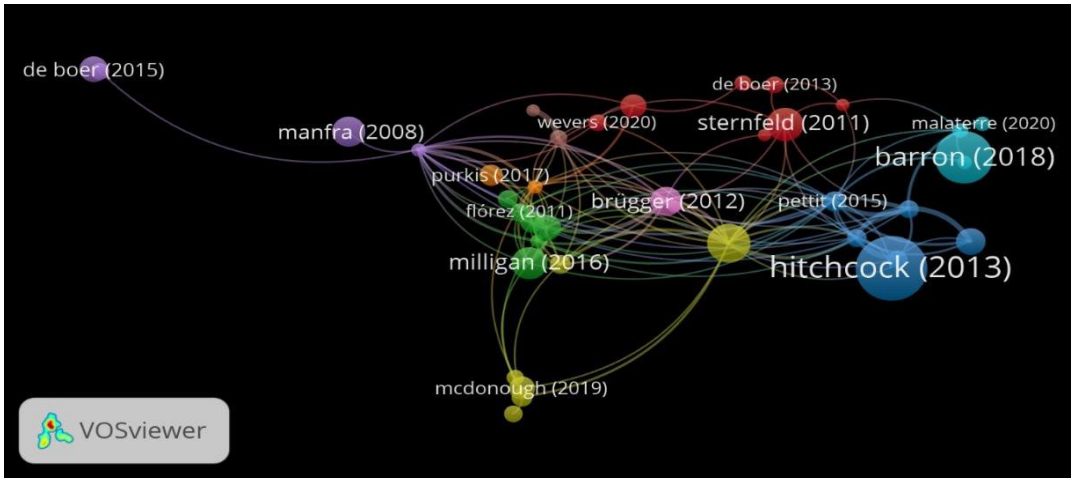

Figure 6. Bibliographic coupling of documents

Co-occurrence of Keywords

Figure 6 visualizes the co-occurrence of keywords in digital history research, highlighting thematic connections based on frequently appearing terms. Out of 2057 total keywords, 58 met the minimum occurrence threshold of 5, and these are categorized into 8 distinct clusters of varying sizes and colors. The largest cluster, Cluster 1 (Red), includes 11 keywords, with "digital history" as the central term, underscoring its foundational role in the field. Related terms such as "web archives" and "historic preservation" emphasize methodological and archival themes. Cluster 2 (Green), consisting of 10 keywords like "data mining," "text mining," and "crowdsourcing," reflects a focus on computational and collaborative methodologies. Similarly, Cluster 3 (Blue), with 9 keywords including "digitization," "media history," and "newspapers," underscores the role of digital technologies in media and archival studies. Cluster 4 (Yellow), with 9 keywords, connects "digital humanities," "history," and "education," highlighting the intersection of digital tools with teaching and historical scholarship. Cluster 5 (Purple) focuses on cultural aspects, with terms like "cultural heritage" and "cultural heritages," emphasizing preservation and representation. Cluster 6 (Cyan) explores data-driven methodologies with 7 keywords such as "big data" and "information retrieval," reflecting the use of large datasets in advancing historical research. Smaller clusters like Cluster 7 (Orange) and Cluster 8 (Brown) focus on specific topics, including "visualization" and "data visualization" in Cluster 7, and a single niche term in Cluster 8. This network analysis highlights the interdisciplinary nature of digital history, emphasizing its reliance on computational tools, cultural preservation, and educational applications, while showcasing the diversity and interconnectedness of research themes in the field.

Figure 7. Co-occurrence of all keywords

Co-Authorship Countries

Figure 7 visualizes country collaborations in digital history research, showcasing relationships among 24 countries from a total of 44 that meet a minimum document threshold of 2. These countries are organized into 7 distinct clusters, reflecting their collaborative ties and thematic overlaps. The United States is the most prominent node, indicating its central role in driving scholarly discourse in digital history. It exhibits strong collaborations with other leading contributors such as the United Kingdom, Netherlands, and Germany, which form key hubs within their clusters. These partnerships suggest active international collaboration, particularly in regions with advanced digital infrastructure and established research networks. The clusters highlight regional and global connections. For instance, Cluster 1 (Green) includes countries like Germany, Finland, and Austria, emphasizing European collaboration in digital humanities and archival studies. Cluster 2 (Blue) features the Netherlands, Japan, and Ireland, showcasing cross-continental research activities. Similarly, Cluster 3 (Purple), centered around the United Kingdom, highlights its strong ties with the United States and other English-speaking countries. The temporal gradient (2017–2022) indicates that these collaborations are evolving, with increasing contributions from emerging players like China, Italy, and Brazil. This network underscores the

interdisciplinary and international nature of digital history, with robust collaboration among researchers from both established and emerging academic centers.

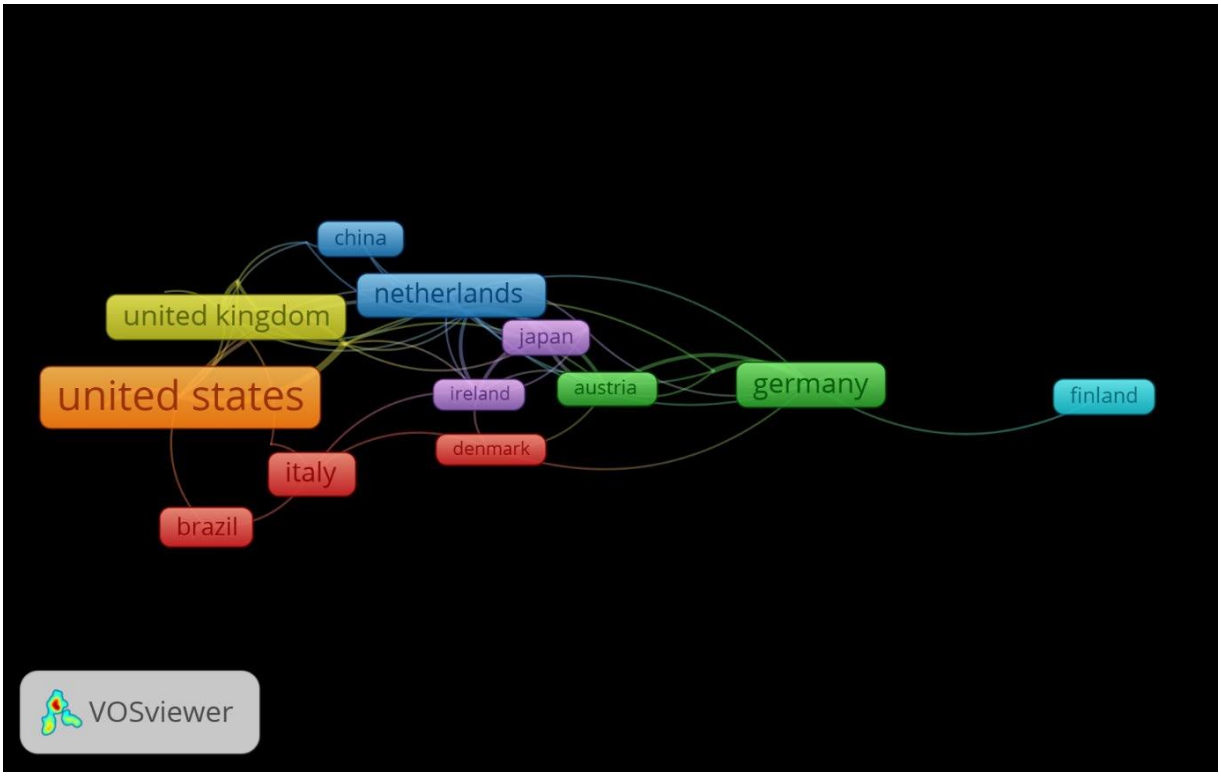

Figure 8. Countries collaborations

4. DISCUSSIONS

The bibliometric analysis of digital history research reveals key findings that demonstrate the field's dynamic growth and interdisciplinary nature. First, the study identified significant growth in publication trends, with an annual growth rate of 10.98% and a notable peak in 2023. This upward trajectory underscores the increasing prominence of digital history as a research domain, driven by advancements in digital tools and the integration of computational methods into historical inquiry. Moreover, the analysis highlighted a diverse range of publication formats, including journal articles, book chapters, and conference papers, reflecting varied approaches to disseminating knowledge within the field.

The analysis of author contributions and source relevance underscored the collaborative and interdisciplinary nature of digital history. Key authors such as Adam Jatowt, Ian Milligan, and Christopher D. Green emerged as pivotal figures, contributing significantly to the field's development. Similarly, prominent sources like Lecture Notes in Computer Science and CEUR Workshop Proceedings demonstrated their centrality in integrating computational approaches with historical research. These findings emphasize the foundational role of influential authors and sources in shaping the intellectual landscape of digital history and fostering collaboration across disciplines.

Thematic mapping and keyword co-occurrence analyses revealed the diversity of topics and methodologies within digital history. Foundational themes like "digital history," "digital humanities," and "archives" dominate the discourse, while emerging topics such as "crowdsourcing," "data visualization," and "microhistory" highlight innovative and computational approaches. The thematic map further identified specialized areas, such as "conceptual history" and "big data," which offer depth but require broader integration. This thematic diversity underscores the field's adaptability and responsiveness to technological advancements and evolving research priorities.

Finally, the analysis of country collaborations demonstrated the global reach of digital history research. The United States, the United Kingdom, and Germany emerged as central hubs for international collaborations, with active partnerships extending to emerging contributors like China, Italy, and Brazil. These collaborations highlight the interdisciplinary and international nature of digital history, where robust research networks facilitate knowledge exchange and the development of innovative methodologies. Together, these findings showcase digital history as a thriving, evolving field that continues to expand its boundaries and impact.

5. RESEARCH GAPS AND PRACTICAL IMPLICATIONS

The study reveals several research gaps that need attention to advance the field. Foundational themes like "digital history," "digital humanities," and "archives," hile widely researched, remain underdeveloped in terms of theoretical depth and complexity, indicating a need for more nuanced explorations and frameworks. Similarly, niche themes such as "game-based learning," "conceptual history," and "big data," though well-developed within specific subfields, lack integration into mainstream digital history research. This limits their broader impact and interdisciplinary potential. Furthermore, emerging or declining themes, including "history of psychology," "digital historiography," and "cultural heritage," require renewed focus, potentially through innovative applications of digital tools to re-establish their relevance. The limited adoption of advanced computational methodologies like "text mining" and "crowdsourcing" across diverse subfields highlights a gap in training, accessibility to digital resources, and interdisciplinary engagement. Addressing these gaps has practical implications for the field of digital history. Strategic resource allocation is essential to strengthen both foundational themes and specialized areas, fostering their theoretical and practical development. Enhanced interdisciplinary collaboration with fields such as data science, cultural studies, and education could expand the application of niche themes and computational methodologies. Insights from these gaps could inform the development of academic curricula and training programs, equipping researchers with the skills to adopt and integrate advanced methods like data visualization and crowdsourcing. Additionally, the development of user-friendly digital tools tailored to the needs of historians could facilitate the adoption of emerging methodologies, making advanced techniques more accessible. Together, these efforts could enhance the field's theoretical richness, methodological diversity, and broader societal impact.

6. CONCLUSION

This bibliometric study underscores the rapid growth and interdisciplinary nature of digital history, driven by the integration of computational tools and digital methods to enhance historical research and accessibility. Despite these advancements, gaps remain in the theoretical development of foundational themes, the broader integration of niche areas, and the widespread adoption of emerging methodologies. To address these challenges, fostering interdisciplinary collaboration between historians and technology experts is essential for bridging methodological gaps. Additionally, developing user-friendly digital tools can facilitate the application of advanced techniques like text mining and data visualization, even for researchers with limited technical expertise. Enhancing academic curricula by incorporating training in digital tools and computational methods will further equip historians with modern research skills. These strategies will ensure digital history continues to evolve, expand its impact, and remain relevant in both scholarly and public domains.

ACKNOWLEDGEMENT

None.

CONFLICT OF INTEREST

None.

REFERENCES

D. L. Andersen, “Benchmarks: Defining digital history,” *J. Assoc. Hist. Comput.*, vol. 5, no. 1, 2002, [Online]. Available: https://www.scopus.com/inward/record.uri?eid=2-s2.0-3042836114&partnerID=40&md5=68e416c77316b7ee1174b10aca8c4de9

J. Hart, “Introduction: Digital History in African Studies,” *Hist. Afr.*, vol. 47, pp. 269–274, 2020, doi: 10.1017/hia.2020.5.

H. Salmi, *What is digital history?* John Wiley & Sons, 2020.

T. L. Barnett, “The Age Old Question: A Review of What is Digital History? by Hannu Salmi,” *Digit. Humanit. Q.*, vol. 15, no. 4, 2021, [Online]. Available: https://www.scopus.com/inward/record.uri?eid=2-s2.0-85130285588&partnerID=40&md5=10e2a3992f30def69a752fa568dc6581

D. Arigo, D. E. Jake-Schoffman, K. Wolin, E. Beckjord, E. B. Hekler, and S. L. Pagoto, "The history and future of digital health in the field of behavioral medicine," *J. Behav. Med.*, vol. 42, no. 1, pp. 67–83, 2019, doi: 10.1007/s10865-018-9966-z.

G. da Silva Prado, "For a digital history: the profession of historian in the Internet age," *Tempo E Argum.*, vol. 13, no. 34, 2021, doi: 10.5965/2175180313342021E0201.

M. Jones and A. Piper, "Digital History," *Aust. Hist. Stud.*, vol. 55, no. 1, pp. 178–203, 2024, doi: 10.1080/1031461X.2023.2267586.

B. Heuwing, T. Mandl, and C. Womser-Hacker, "Methods for user-centered design and evaluation of text analysis tools in a digital history project," *Proc. Assoc. Inf. Sci. Technol.*, vol. 53, no. 1, pp. 1–10, 2016, doi: 10.1002/pra2.2016.14505301078.

D. C. Hidalgo, J. C. Martínez, and B. H. Martos, "Digital History and the Question of Palestine: Developing Tools to Fight Memoricide," *Vegueta*, vol. 22, no. 1, pp. 137–156, 2022, doi: 10.51349/veg.2022.1.08.

B. Heuwing and C. Womser-Hacker, "Between Observation and Participation - Application of User Centered Methods for a Requirements Analysis in a Digital History Project," *Inf.-Wiss. Prax.*, vol. 66, no. 5–6, pp. 335–344, 2015, doi: 10.1515/iwp-2015-0058.

F. A. dos Santos Ribeiro, J. R. Sales, A. P. do Nascimento, and A. Fortes, "Exploring the potentials of digital history: The experience of the Documentary and Image Center of the Federal Rural University of Rio de Janeiro – Nova Iguaçu campus," *Estud. Hist.*, vol. 33, no. 69, pp. 153–172, 2020, doi: 10.1590/S2178-14942020000100009.

S. Lssig, "Digital history challenges and opportunities for the profession," *Gesch. Ges.*, vol. 47, no. 1, pp. 5–34, 2021, doi: 10.13109/gege.2021.47.1.5.

I. Gregory, "Challenges and opportunities for digital history," *Front. Digit. Humanit.*, vol. 1, p. 1, 2014.

G. Zaagsma, "On digital history," *BMGN-Low Ctries. Hist. Rev.*, vol. 128, no. 4, 2013.

H. L. Crossen-White, "Using digital archives in historical research: What are the ethical concerns for a 'forgotten'individual?," *Res. Ethics*, vol. 11, no. 2, pp. 108–119, 2015.

R. Albrecht, J. Hulstijn, I. Tchappi, and A. Najjar, "Towards Interactive and Social Explainable Artificial Intelligence for Digital History," presented at the Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics), 2024, pp. 189–202. doi: 10.1007/978-3-031-70074-3_11.

F. Armaselu and A. Fickers, *Zoomland: Exploring scale in digital history and humanities*. in Zoomland: Exploring Scale in Digital History and Humanities. 2023, p. 481. doi: 10.1515/9783111317779.

H. B. K. Marodin, "The History of Digital History: A Review of Crymble (2021)," *Digit. Humanit. Q.*, vol. 17, no. 1, 2023, [Online]. Available: https://www.scopus.com/inward/record.uri?eid=2-s2.0-85162789001&partnerID=40&md5=605f3cc4cb03698eeb6ceb7072f906e9

C. A. Romein *et al.*, "State of the field: digital history," *History*, vol. 105, no. 365, pp. 291–312, 2020.

N. Brügger, "When the present web is later the past: Web historiography, digital history, and internet studies," *Hist. Soc. Res.*, vol. 37, no. 4, pp. 102–117, 2012.

C. Brennan, "Digital humanities, digital methods, digital history, and digital outputs: History writing and the digital revolution," *Hist. Compass*, vol. 16, no. 10, p. e12492, 2018.

Q. Wang, "Distribution features and intellectual structures of digital humanities: A bibliometric analysis," *J. Doc.*, vol. 74, no. 1, pp. 223–246, 2018.

F. Husain and M. S. Mustafa, "A Decade of Islamic Banking Research: Bibliometric Review with Biblioshiny and Vosviewer," *Jambura Sci. Manag.*, vol. 5, no. 2, pp. 67–85, 2023.

D. Kumar, A. K. Shandilya, and S. Choudhuri, "Artificial Intelligence-Enabled Bibliometric Analysis in Tourism and Hospitality Using Biblioshiny and VOSviewer Software," in *AI-Centric Modeling and Analytics*, CRC Press, 2023, pp. 260–291.

M. H. Fahamsyah, I. Mawardi, N. Laila, and M. S. Shabbir, "Global Islamic Banking Development: A Review and Bibliometric Analysis Using R-Biblioshiny Application," *Muqtasid J. Ekon. Dan Perbank. Syariah*, vol. 14, no. 1, pp. 69–92, 2023.

P. Thangavel and B. Chandra, "Two Decades of M-Commerce Consumer Research: A Bibliometric Analysis Using R Biblioshiny," *Sustainability*, vol. 15, no. 15, p. 11835, Aug. 2023, doi: 10.3390/su151511835.

P. Waghmare, "Bibliometric Analysis of Global Research Trends on E-Waste Management from Scopus Database seen through Biblioshiny," *Library Philosophy and Practice*, vol. 2021. pp. 1–16, 2021.

D. Guleria and G. Kaur, "Bibliometric analysis of ecopreneurship using VOSviewer and RStudio Bibliometrix, 1989–2019," *Libr. Hi Tech*, vol. 39, no. 4, pp. 1001–1024, 2021.

A. F. Abbas, A. Jusoh, A. Masod, and J. Ali, "A Bibliometric Analysis of Publications on Social Media Influencers Using Vosviewer," *J. Theor. Appl. Inf. Technol.*, vol. 99, no. 23, pp. 5662–5676, 2021.

R. Kumar, S. Saxena, V. Kumar, V. Prabha, R. Kumar, and A. Kukreti, "Service innovation research: a bibliometric analysis using VOSviewer," *Compet. Rev. Int. Bus. J.*, vol. 34, no. 4, pp. 736–760, 2024.

A. Kuzior and M. Sira, "A bibliometric analysis of blockchain technology research using VOSviewer," *Sustainability*, vol. 14, no. 13, p. 8206, 2022.

N. J. Van Eck and L. Waltman, "Software survey: VOSviewer, a computer program for bibliometric mapping," *Scientometrics*, vol. 84, no. 2, pp. 523–538, Aug. 2010, doi: 10.1007/s11192-009-0146-3.

Z. Guofang, M. S. Rasul, and M. Omar, "A Bibliometric Analysis of Publications on University-Industry Collaboration Using VOSviewer and R-biblioshiny," *Multidiscip. J. Educ. Soc. Technol. Sci.*, vol. 11, no. 2, pp. 26–50, 2024.

J. Baas, M. Schotten, A. Plume, G. Côté, and R. Karimi, "Scopus as a curated, high-quality bibliometric data source for academic research in quantitative science studies," *Quant. Sci. Stud.*, vol. 1, no. 1, pp. 377–386, Feb. 2020, doi: 10.1162/qss_a_00019.

Y. Gavel and L. Iselid, "Web of Science and Scopus: a journal title overlap study," *Online Inf. Rev.*, vol. 32, no. 1, pp. 8–21, 2008.

A.-W. Harzing and S. Alakangas, "Google Scholar, Scopus and the Web of Science: a longitudinal and cross-disciplinary comparison," *Scientometrics*, vol. 106, pp. 787–804, 2016.