

RESEARCH ARTICLE

Research Trends in Social Media Communication and Big Data: A Bibliometric Analysis of Google Scholar Publications (2019–2023)

Sultan Sahrir^{**}, Nuzul Syarbini, Adelia, Syafira Faradiba Syahrudin, Nita Nurhalifah

Received: June 25, 2026 / Revised: August 19, 2026 / Accepted: August 21, 2026

Abstract

The rapid growth of big data has transformed social media into a major source of communication data and research. This study aims to map publication trends, identify the most influential publications, and examine the major research themes in social media communication and big data research. A descriptive quantitative method with a bibliometric approach was employed. Data were retrieved from Google Scholar using Publish or Perish, with an initial retrieval of 1,000 documents. After metadata validation and screening in Mendeley Desktop, 156 publications from 2019 to 2023 were included for analysis. Bibliometric mapping was performed using VOSviewer. The findings indicate a consistent increase in publications, peaking at 53 (34%) in 2023. Citation analysis identified the ten most influential publications, with the highest-cited article receiving 15 citations. Keyword co-occurrence analysis revealed four major thematic clusters. At the same time, “social media” emerged as the dominant keyword with 82 occurrences and a total link strength of 91, followed by “big data” (34 occurrences) and “communication” (34 occurrences). The visualisation also highlights the growing prominence of themes such as sentiment analysis, Twitter, digital communication, Industry 4.0, and artificial intelligence. These findings demonstrate that research on social media communication and big data has expanded substantially and provide a comprehensive overview of the intellectual structure and emerging research directions in this field.

Keywords Research trend; Big data; Communication; social media; Google scholar

* Sultan Sahrir, Nuzul Syarbini, Adelia, Syafira Faradiba Syahrudin, Nita Nurhalifah. Department of Communication Science, Hasanuddin University Makassar, Indonesia. Corresponding author: sultansahrir23456@gmail.com

Abstrak

Pesatnya pertumbuhan big data telah mengubah media sosial menjadi sumber utama data komunikasi dan penelitian. Studi ini bertujuan untuk memetakan tren publikasi, mengidentifikasi publikasi yang paling berpengaruh, serta mengkaji tema-tema penelitian utama dalam bidang komunikasi media sosial dan penelitian big data. Metode kuantitatif deskriptif dengan pendekatan bibliometrik digunakan dalam penelitian ini. Data diperoleh dari Google Scholar menggunakan perangkat lunak Publish or Perish, dengan pengambilan awal sebanyak 1.000 dokumen. Setelah melalui validasi metadata dan penyaringan menggunakan Mendeley Desktop, sebanyak 156 publikasi dari rentang tahun 2019 hingga 2023 dipilih untuk dianalisis. Pemetaan bibliometrik dilakukan menggunakan VOSviewer. Hasil penelitian menunjukkan adanya peningkatan jumlah publikasi yang konsisten, dengan angka tertinggi mencapai 53 publikasi (34%) pada tahun 2023. Analisis sitasi mengidentifikasi sepuluh publikasi paling berpengaruh, di mana artikel dengan jumlah sitasi terbanyak memperoleh 15 sitasi. Analisis kemunculan bersama kata kunci (keyword co-occurrence) mengungkapkan empat kluster tematik utama. Pada saat yang sama, “social media” (media sosial) muncul sebagai kata kunci dominan dengan 82 kemunculan dan total kekuatan tautan sebesar 91, diikuti oleh “big data” (34 kemunculan) dan “communication” (34 kemunculan). Visualisasi data juga menyoroti semakin menonjolnya tema-tema seperti analisis sentimen, Twitter, komunikasi digital, Industri 4.0, dan kecerdasan buatan (artificial intelligence). Temuan ini menunjukkan bahwa penelitian mengenai komunikasi media sosial dan big data telah berkembang secara signifikan, serta memberikan gambaran komprehensif mengenai struktur intelektual dan arah penelitian yang sedang berkembang di bidang ini.

Kata kunci *Tren riset; Big data; Komunikasi; Media sosial; Google scholar*

Introduction

Indonesia is currently facing increasingly complex communication challenges as social media becomes the primary arena for information exchange, public participation, and digital interaction, requiring a more comprehensive scientific understanding than merely describing its widespread adoption. Humah and Hi Hi Abdullah (2023) explain that Indonesia guarantees freedom of expression through Article 28E paragraph (1) of the 1945 Constitution, allowing citizens to communicate and express opinions through digital platforms within the applicable legal framework. Kusuma and Rahmani (2022) state that the implementation of social media is inseparable from communication and information regulations that govern the operation of digital platforms while ensuring responsible use in public communication. Sahib et al. (2023) further emphasise that electronic system providers are required to protect users' security and privacy, as increasing digital interactions have simultaneously heightened risks to personal data protection and digital trust. These conditions indicate that the current challenge of social

media in Indonesia is no longer limited to expanding access to communication but has shifted toward ensuring secure, ethical, and accountable digital communication practices, which warrant more comprehensive scholarly attention.

Communication activities on social media continue to generate massive digital footprints that offer strategic opportunities to analyse communication behaviour using big data approaches. Thoha et al. (2023) argue that advances in information and communication technology have fundamentally transformed the way individuals interact, exchange information, and participate in digital communication ecosystems. Septa and Hoirul (2022) explain that the rapid growth of digital activities continuously produces enormous volumes of big data, creating opportunities to understand social behaviour and communication dynamics more comprehensively than conventional communication research approaches. Marin-Marín et al. (2019) state that one of the principal objectives of big data analysis is to transform diverse digital data into meaningful information that can support evidence-based decision-making and the development of scientific knowledge. These developments demonstrate that communication research increasingly requires analytical approaches capable of interpreting large-scale digital interactions rather than relying solely on descriptive explanations of social media growth.

The integration of social media and big data has expanded communication research beyond message dissemination to encompass understanding behavioural patterns, public opinion, and strategic decision-making across various sectors. Ifadhila et al. (2024) explain that big data enables organisations to identify audience preferences, behavioural patterns, and communication needs through comprehensive analysis of digital interactions, thereby improving the effectiveness of communication and marketing strategies. Sandra et al. (2023) emphasise that technological developments in artificial intelligence, machine learning, sentiment analysis, and text mining have significantly improved the ability to derive valuable insights from large-scale social media data for communication. Lubis and Nasution (2023) further argue that social media data help organisations evaluate consumer responses, identify emerging issues, and develop more responsive communication strategies grounded in empirical digital evidence. These findings confirm that the convergence of social media and big data has transformed digital communication into an increasingly data-driven field, creating an urgent need to understand how this research area has evolved and what thematic directions dominate current scientific publications.

Scientific investigations into social media communication and big data have expanded across numerous disciplines, demonstrating that digital communication has become an important research domain that requires systematic knowledge mapping. Jin

et al. (2024) explain that big data-driven communication strategies enable media organisations to analyse audience characteristics quantitatively while strengthening interaction between content producers and information consumers through digital technologies. Lai (2023) argues that continuous technological innovation has transformed social networking platforms into essential communication infrastructures. However, these developments simultaneously create new challenges related to information isolation, radicalisation, and declining face-to-face interaction. Saito and Gupta (2022) demonstrate that integrating social media indicators into analytical models improves decision-making accuracy across business and financial sectors by incorporating digital communication data into organisational strategies. These studies collectively indicate that social media has become an increasingly important subject of scientific investigation. However, existing research remains concentrated on specific application contexts rather than on a comprehensive examination of the field's evolution.

Previous studies have provided valuable contributions to understanding the practical utilisation of social media and big data, yet their findings reveal that scholarly attention remains fragmented across different disciplinary perspectives. April et al. (2024) explain that previous investigations have predominantly focused on specific industries, including journalism, hospitality, and financial services, leaving broader communication contexts insufficiently explored. Hamali et al. (2023) emphasise that many existing studies offer theoretical discussions without providing practical guidance for organisations to utilise social media and big data effectively while addressing ethical considerations and privacy protection. Rini et al. (2024) state that interdisciplinary collaboration among communication, information technology, and data science has become increasingly important because digital communication problems require integrated analytical approaches to produce innovative solutions. These findings demonstrate that existing scholarship has generated important theoretical and practical knowledge but has not yet established a comprehensive understanding of the development of publications, intellectual structure, and thematic evolution in social media communication research.

Bibliometric analysis is an appropriate methodological approach for synthesising the rapidly growing body of literature on social media communication and big data, as it enables researchers to simultaneously identify publication patterns, scientific influence, and emerging research themes. Nugroho et al. (2019) explain that advances in big data analytics have created new opportunities to examine communication phenomena through more comprehensive and timely analyses than conventional literature reviews can provide. Kurdi and Kurdi (2021) argue that bibliometric studies facilitate the identification of collaboration networks, research trends, and thematic

relationships, thereby supporting the formulation of future research agendas in rapidly evolving scientific fields. Krishna et al. (2023) further state that bibliometric analysis, an important branch of scientometrics, enables researchers to understand the development, structure, and evolution of scientific knowledge from published literature. These perspectives confirm that bibliometric mapping is a rigorous approach to systematically evaluating the development of social media communication and big data research, while providing stronger academic evidence on the direction of future studies.

Current studies have demonstrated the use of social media and big data across sectors such as journalism, hospitality, finance, marketing, education, and public communication. Existing publications have predominantly examined the effectiveness of digital communication strategies, sentiment analysis, consumer behaviour, digital marketing, and technological implementation within specific organisational contexts. Limited scholarly attention has been paid to understanding how this body of knowledge has evolved into an integrated research field. Comprehensive evidence regarding publication growth, influential scientific works, thematic relationships, keyword evolution, and emerging research directions remains fragmented across disciplines. Systematic bibliometric mapping is therefore required to provide a holistic understanding of the intellectual structure of social media communication and big data research rather than continuing to examine isolated application areas.

This study offers several distinctive contributions that differentiate it from previous investigations. Comprehensive bibliometric mapping is conducted using Google Scholar publications covering the period 2019–2023, providing broader multidisciplinary coverage than studies that focus exclusively on particular industries or databases. Scientific development is evaluated using publication trends, citation performance, keyword co-occurrence, network relationships, temporal evolution, and density visualisation, all within a single analytical framework, with Publish or Perish, Mendeley Desktop, and VOSviewer. Integrated analysis enables the identification of dominant research themes, intellectual relationships among topics, and emerging directions not comprehensively presented in previous studies. Novel findings generated through this approach provide a clearer representation of the development of social media communication and big data research while strengthening the scientific foundation for future investigations.

Understanding the evolution of scientific publications concerning social media communication and big data has become increasingly important because digital communication continues to influence public policy, business innovation, education, governance, and community interaction in Indonesia and globally. Reliable bibliometric evidence can help researchers identify mature research areas, emerging themes, and

promising opportunities for future interdisciplinary collaboration. Practical findings may also assist academics, policymakers, communication practitioners, and organisations in developing more evidence-based digital communication strategies aligned with contemporary technological developments. Based on these considerations, this study addresses three research questions: How have publication trends related to social media communication and big data developed during 2019–2023? Which scientific publications have demonstrated the greatest influence based on citation analysis? What dominant research themes and keyword relationships can be identified through bibliometric mapping using VOSviewer? Answering these questions is expected to strengthen theoretical understanding while providing strategic directions for future research on social media communication in the big data era.

Methods

This study employed a descriptive quantitative research design using a bibliometric analysis approach. Bibliometric analysis is a quantitative method that applies statistical techniques to scientific publications to evaluate publication productivity, citation performance, collaboration patterns, and the intellectual structure of a particular research field (Herawati et al., 2022). Muhammad and Triansyah (2023) define bibliometric analysis as the application of mathematical and statistical methods to scientific literature to collect, calculate, analyse, and interpret publication and citation data, thereby identifying influential publications and research trends. Accordingly, this study applied bibliometric analysis to examine the development of publications, citation performance, and thematic relationships in research on social media communication and big data.

The unit of analysis consisted of journal articles indexed in Google Scholar and published between 2019 and 2023. The study used predefined eligibility criteria rather than purposive sampling. The inclusion criteria were: (1) publications published between 2019 and 2023; (2) publications retrieved from Google Scholar using the combined keywords “Big Data” AND “Social Media” AND “Communication”; (3) documents classified as journal articles; (4) publications relevant to social media, big data, and communication; and (5) records containing sufficient bibliographic information for bibliometric analysis. The exclusion criteria consisted of duplicate records, records with incomplete or invalid bibliographic metadata, records containing problematic URLs, documents that were not journal articles, and publications that were not relevant to the research topic. Google Scholar was selected as the data source for its broad, multidisciplinary coverage of scholarly publications. The 2019–2023 period was established as a five-year observation window to provide a consistent temporal basis for

examining the development of research on social media communication and big data. The bibliographic data included publication year, authors, citation counts, journal information, and author keywords.

Data collection was conducted on 15 January 2026 using three sequential stages. First, publication retrieval was conducted using Harzing's Publish or Perish (PoP) with Google Scholar as the primary database. The search employed the Boolean combination "Big Data" AND "Social Media" AND "Communication", with a maximum retrieval limit of 1,000 records. The search was restricted to publications from 2019 to 2023. The initial search retrieved 1,000 records, which were subsequently screened and metadata-validated.

The screenshot displays the Harzing's Publish or Perish (PoP) application interface. The main window shows a list of search results with columns for Cites, Per year, Rank, Authors, Title, Year, Publication, Publisher, and Type. The results are sorted by citation count, with the top entry having 15 citations. The interface also includes a sidebar with search filters and a right-hand panel showing citation metrics and paper details.

Cites	Per year	Rank	Authors	Title	Year	Publication	Publisher	Type
15	7.50	91	Devi Hermita Kus...	Penggunaan Media Sosial terhadap Pencegahan Penyebaran HIV/AIDS	2022	Jurnal Kepersawatan Slatam...	jurnal.igpm2020.id	JOUR
11	3.67	52	Livia Tamarsani, K...	Peran Komunikasi Media Sosial Yang Dibuat Perusahaan, Komunikasi Media Sosial Yang Dibuat Pengguna Terhadap Niat Beli Dimediasi Brand Passion	2021	Jurnal Ilmiah Manajemen ...	jurnal.umsu.ac.id	JOUR
10	3.33	35	Muhammad Rach...	Dialektika Hegel (Tesis-Antitesis-Sintesis) Dalam Etika Dan Filsafat Berkomunikasi Era Kontemporer	2021	Jurnal Komunikasi	researchgate.net	PDF
9	3.00	42	Hasan Asnari Ba...	Kompetensi Widyaiswara di Era Digital dan Media Sosial	2021	PNUGS: Jurnal Penelitian L...	ojs.umpkedi.ac.id	JOUR
7	1.75	12	Nurul Fikriati Ayu...	Big Data Dan Pemanfaatannya Di Perpustakaan	2020	Jurnal Ilmu Perpustakaan ...	jurnal.ummat.ac.id	JOUR
7	1.75	28	Khairil Anam, Laia...	The Effectiveness of Social Media Usage within Social Movement to Reject the Reclamation of the Jakarta Bay, Indonesia	2020	Sodaligy: Jurnal Sosiologi ...	academia.edu	PDF
4	4.00	112	Neng Susi, Susila...	Big Data Sebagai Referensi Trend Fashion: Strategi Dalam Inovasi Pemasaran	2023	Jurnal Ilmiah Teknologi ...	ojs.stmik-banjarnegara.ac.id	JOUR
4	4.00	117	Stepanus Angga...	Etika Komunikasi Netizen Indonesia di Media Sosial sebagai Ruang Demokrasi dalam Telaah Ruang Publik Jürgen Habermas	2023	Jurnal Filsafat Indonesia	ejournal.undiksha.ac.id	JOUR
3	0.75	20	Ghozali Ghazali	Jaringan Internet Dan Sosial Media Dalam Rantai Pasokan Dan Logistik	2020	Media Mahardhika	ojs.stiemahardhika.ac.id	JOUR
3	1.00	45	Sucilo Adji Purnam...	Media Sosial: Peran dan Kiprah dalam Pengembangan Wawasan Kebangsaan	2021	Jurnal Lembangan Ri	jurnal.lembangan.go.id	JOUR
3	1.50	89	M Yusuf Samad, F...	Persebaran Propaganda di Media Sosial Twitter Guna Menyebarkan Informasi Terkait Covid-19	2022	Jurnal Riset Manajemen K...	journals.uniba.ac.id	JOUR
3	1.50	92	Andri Nur Rahma...	Peningkatan Pengetahuan Dengan Sosialisasi Mengenai Pentingnya Merajaga Kesehatan Sertifikat Vaksin Melalui Media Sosial	2022	Dharma Pengabdian Perg...	jurnal.labb.ac.id	JOUR
2	0.67	40	Leena Elsa N, Anis...	Information Security Awareness and Privacy Protection Behavior in Using Social Media	2021	Seminar Nasional Teknol...	statis.upjatim.ac.id	JOUR
2	1.00	73	Ayu Kinasari Ni...	Classification of Public Figures Sentiment on Twitter using Big Data Technology	2022	Journal of Informatics an...	ojs.uma.ac.id	JOUR
2	2.00	121	Erwin Ginting, Yo...	Kesadaran Keamanan Informasi Data Pribadi Terhadap Pengguna Media Sosial	2023	TUNESJournal of Informat...	fe.eksabaki.org	JOUR
2	2.00	140	Dian Setiabudi Ku...	Peran Kepemimpinan Suatu Institusi dalam Mengakselerasi Penanganan Korupsi di Era Digitalisasi 5.0 dan Sosial Media dengan Kepemimpinan Manajemen ...	2023	Anuarul	ejournal.ain-mandao.ac.id	JOUR
1	0.20	1	Abdillah Nurshafa	Analisis Pelekat Brand Pada Jejaring Sosial Perilaku Menggunakan Metode Social Network Analysis (Studi Kasus Brand Alfamart dan Indomaret pada ...	2019	e-Proceeding of Manage...	ajel.telkomuniversity.ac.id	JOUR
1	0.50	65	Eric Christian Lum...	Analisis Jejaring Komunikasi German Digital #PERCUMALAPORPOLISI di Twitter	2022	Jurnal Nomosofia	scholar.archive.org	PDF
1	0.50	85	Anyelin Rahmi Jun...	Metode Analisis Wacana Dalam Media Sosial	2022	Dakwatulrobb: Journal of ...	ummasgul-e-journal.id	PDF
1	1.00	113	Valentino Prasetyo...	Deteksi Anxiety Disorder Pengguna Sosial Media Menggunakan Deep Transfer Learning untuk Percepatan Pemulihan Pasca Pandemi	2023	The Journal on Machine L...	jmlc.kominfo.go.id	JOUR
1	1.00	125	Pratama Waisito ...	Manajemen Privasi Generasi Z Menghadapi Komersialisasi Data Pribadi di Media Sosial	2023	JURNAL IPTEKXKOM Jurnal ...	jurnal.kominfo.go.id	JOUR
1	1.00	135	Erin Tamara Hutu...	Pengaruh Sosial Media Marketing Dan Electronic Word of Mouth Terhadap Keputusan Pembelian Produk Maybeline Pada Mahasiswa Universitas Hibit No...	2023	Jurnal Bisnis Corporate	jurnal.dharmawangsa.ac.id	JOUR
1	1.00	155	Dwi, Tri Asmoro, B...	Systematic Literature Review: Peningkatan Daya Saing Industri Kreatif Kerajinan Dan Batik dengan Memanfaatkan Teknologi Informasi Dan Komunikasi (TIK) ...	2023	Prosiding Seminar Nasion...	proceeding.batik.go.id	JOUR
0	0.00	2	Christiany Juditha	Agenda Setting Penyebaran Hoaks di Media Sosial	2019	Jurnal Penelitian Komunik...	jpk.kominfo.go.id	JOUR
0	0.00	3	Dina Mirena, Iwa...	Pemanfaatan Media Sosial Sebagai Strategi Kesehatan Digital Di Era Revolusi Industri 4.0	2019	Jurnal Komunikasi	eco-entrepreneurstrunjo...	JOUR
0	0.00	4	Isyathul dan M. Fa...	Penerapan Teknologi Informasi Berbasis Media Sosial Pada Pembelajaran Writing for Professional Context	2019	1st National Seminar of E...	proceeding.unikal.ac.id	JOUR
0	0.00	5	Nova Indit Wijay...	Pengaruh sosial media terhadap user engagement pada akun facebook perpustakaan perguruan tinggi	2019	Berkala Ilmu Perpustakaan...	jurnal.ugm.ac.id	JOUR
0	0.00	6	Arlina Permanasari	Relevansi Prinsip Perbedaan Dan Big Data Dalam Perang Siber Pada Era Revolusi Industri 4.0	2019	Hukum Pidana dan Pemb...	e-journal.trisakti.ac.id	JOUR
0	0.00	7	Zulfantri Nursani...	Understanding Big Data and Digital Business	2019	Mimbar Pendidikan	ejournal.upi.edu	JOUR
0	0.00	8	Emyana Ruth Endu...	Implementasi Teknologi Big Data Di Lembaga Pemerintahan Indonesia	2019	Jurnal Penelitian Pos dan L...	ejournal.universitasmend...	JOUR
0	0.00	9	Shelly Kurniawan...	Pengembangan Artificial Intelligence Terhadap Telah Masyarakat dalam Konten di Media Sosial Berdasarkan Perundangan-Undangan di Indonesia	2019	Correspondence & An...	uia-e-journal.id	JOUR
0	0.00	10	Raymond Damara E...	Analisis Kelayakan Kredit Pada Peer To Peer Lending Menggunakan Data Sosial Media (Studi Kasus: LinkedIn)	2020	e-Proceeding of Manage...	ajel.telkomuniversity.ac.id	JOUR
0	0.00	11	Paisal Paisal	Analisis Sentimen Masyarakat Berdasarkan Opini dari Sosial Media Menggunakan Metode Naive Bayes Classifier (Studi Kasus: Universitas Sjakhyatun)	2020	Jurnal Ilmiah Informatika ...	ejournal.ugm.ac.id	JOUR

The right-hand panel shows citation metrics: Citation years: 2019-2023, Citation years: 5 (2019-2024), Papers: 156, Citations: 94, Cites/year: 18.80, Cites/paper: 0.60, Cites/author: 43.77, Papers/author: 84.94, Authors/papers: 2.56. It also includes a 'Copy Results' button and a 'Save Results' button. The 'Paper details' section shows the title 'Penggunaan Media Sosial terhadap Pencegahan Penyebaran HIV/AIDS' by Devi Hermita, Kuslan Drahni, and Urip Rahayu (2022), with a link to the full text.

Figure 1. Harzing's Publish or Perish application.

Source: Secondary data processing result, 2026

Second, the retrieved records were exported in RIS format and imported into Mendeley Desktop for reference management, metadata verification, and data cleaning. Mendeley Desktop was not used as a bibliometric analysis tool but served exclusively to organise references, verify bibliographic metadata, identify and remove duplicate records, eliminate incomplete or invalid metadata, remove problematic URLs, and exclude documents that were not journal articles or were irrelevant to the research topic.

The screening process removed 844 records from the initial 1,000 retrieved. The exclusion process removed 214 duplicate records, 173 records with incomplete or invalid metadata, 97 records with problematic or unusable URLs, 186 records that were not journal articles, and 174 records that were not relevant to the research topic. After all screening stages had been completed, 156 valid journal articles remained for subsequent bibliometric analysis.

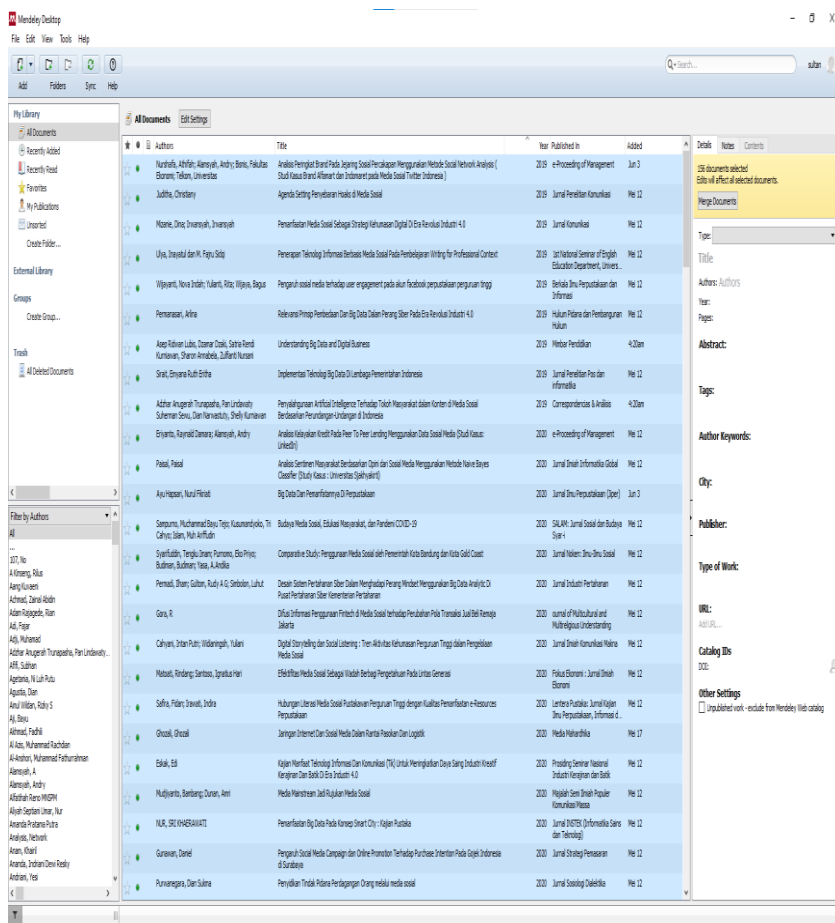


Figure 2. Mendeley Desktop Metadata Application.
Source: Secondary Data Processing Results, 2026

Third, the validated dataset, comprising 156 publications, was imported into VOSviewer for bibliometric analysis. VOSviewer was used to generate keyword co-occurrence networks, keyword clustering, network visualisation, overlay visualisation, and density visualisation to identify thematic relationships, research trends, and the intellectual structure of the field (Muhammad & Triansyah, 2023). The VOSviewer analysis employed full counting as the counting method and association strength as the normalisation method. A minimum occurrence threshold of two (2) was applied to author keywords, resulting in the inclusion of keywords that occurred at least twice in the dataset. This threshold is consistent with the keyword results reported in the manuscript, where the lowest reported occurrence was two.

Table 1. Main Data Information

Results	Explanation
Publication Year	2019-2023
Document Type	Article
Citation Year	5 (2019-2023)
Number of Papers	156
Number of Citations	94
Citations Per Year	18.80
Per-Paper Citations	0.60
Per-Author Citations	43.77
Articles Per-Author	84.94
Author Per Paper	2.56
H Index	6
G Index	8
Individual H Index	4
Index H Year	0.80
hA index	4

Source: Secondary Data Processing Results, 2026

Prior to VOSviewer analysis, equivalent terms and minor variations in keyword terminology were standardised to improve consistency in the mapping process. A thesaurus file was not used because keyword standardisation was conducted during the metadata-cleaning stage before the final dataset was imported into VOSviewer. The final dataset was then analysed through co-occurrence, network, overlay, and density visualisation. The resulting network identified four thematic clusters, while the overlay visualisation was used to examine the temporal development of research topics.

The combination of Publish or Perish for data retrieval, Mendeley Desktop for reference management and metadata verification, and VOSviewer for bibliometric mapping provided a systematic analytical workflow from data retrieval and screening to bibliometric visualisation. The procedure resulted in a final dataset of 156 journal articles published between 2019 and 2023 for subsequent analysis.

Discussion

The Publish Or Perish (PoP) application is software designed to assist in the analysis and visualisation of scientific publication data (Machmuda et al., 2022). This application takes data from various scientific databases, such as Google Scholar, to provide comprehensive information about publications in a particular field. In this study, PoP will be used to analyse the growth in publications on social media communication opportunities in the big data era during 2019-2023.

PoP will help identify the number of publications per year, the most productive authors, the journals or conferences that most frequently publish articles on the topic, and other metrics such as the h-index and number of citations. These can be seen in the table below (see Table 2).

Table 2 shows that, in the Google Scholar database, publications on social media communication opportunities in the big data era during 2019-2023 increased significantly each year. The highest number of publications on social media communication opportunities in the big data era was in 2023, with 53 articles, accounting for 34% of the total.

This shows that the topic of social media communication opportunities in the big data era is increasingly receiving significant attention from academics and researchers. The significant increase in the number of publications each year reflects that this issue is increasingly considered relevant in the context of the development of information and communication technology. In 2023, the number of articles reached 53, accounting for 34% of the total data, indicating a peak in academic interest and exploration of this topic. This could be due to the increasing number of big data applications in social media analysis, as well as the increasing awareness of the importance of understanding the dynamics of digital communication in the modern era.

In addition, this increase indicates rapid development in research methodologies and analytical tools that enable more in-depth and comprehensive studies of social media communication. With the increasing sophistication of big data technology, researchers

can explore the opportunities and challenges of social media on a larger scale and in greater detail. This not only contributes to the academic literature but also offers practical insights for developing communication strategies across sectors, including business, government, and education. Thus, this trend reflects the growing dynamics in communication and information technology studies, which continue to adapt to rapid changes in the digital landscape.

Table 2. Development of Publication of Social Media Communication Opportunities in the Big Data Era in the Period 2019-2023.

Publication Year	Number of Articles	Percentage (%)
2019	9	6%
2020	20	13%
2021	35	22%
2022	39	25%
2023	53	34%
Total	156	100%

Source: Secondary Data Processing Results, 2026

There is a positive trend and continued interest from the scientific community in exploring and utilising big data in the context of social media. The consistent upward trend in the number of publications may indicate that this topic is considered a vital field with much potential that has not been fully explored. The research itself is increasingly relevant amid the paradigm shift in communication and business towards digital, accelerated by technological innovation and the need to understand user behaviour in real time and at scale.

The continued attraction of research on social media communication opportunities in the big data era underscores the importance of big data as a key element in contemporary social media communication strategies and the need to understand its impact on global social, political, and economic life. The results of this study are in accordance with research published by Peng & Ye (2021), which concludes that publications over the past ten years (2010–2019) with the keywords “big data”, “social media”, “data collection”, “Twitter”, “Facebook”, and “privacy” are attracting increasing attention and increasingly reflect research trends. In addition, this is in line with the results of research by Subekti (2022), who found that global research on the use of social media to distribute COVID-19 vaccines, both positive and negative, saw increasing interest from 2020 to 2021.

The big data era has revolutionised various aspects of life, including communication. Social media, as the primary communication platform in the digital era, is increasingly relevant given the rise of big data. Research on social media

communication opportunities in the big data era continues to grow rapidly, producing various valuable findings and insights. Through bibliometric analysis using Publish Or Perish (PoP) in the period 2019-2023, the ten most cited scientific works were identified. These works are important for understanding the development and direction of research in this field. Below is a table of the top 10 most cited:

Table 3. Ten Articles With the Most Citations.

No.	Writer	Title	Year	Source	Publisher	Citation
1.	Harmita et al., (2022)	Use of Social Media to Prevent the Spread of HIV/AIDS	2022	journal.ipm2kpe.or.id	Silampari Nursing Journal	15
2.	Tamarasari et al., (2021)	The Role of Company-Generated Social Media	2021	jurnal.umsu.ac.id	Scientific Journal of Management and Business	11
3.	Al Aziz (2021)	Communication Hegel's Dialectic (Thesis-Antithesis-Synthesis) In Ethics And Philosophy Of Communication In The Contemporary Era	2021	researchgate.net	Journal of Communication	10
4.	Hasan Ashari & Sancoko (2021)	Widyaiswara Competence in the Digital and Social Media Era	2021	ojs.unpkediri.ac.id	PINUS: Journal of Learning Innovation Research	9
5.	Ayu Hapsari (2020)	Big Data and Its Utilization in Libraries	2020	journal.ummat.ac.id	Journal of Library Science (Jiper)	7
6.	Anam et al. (2020)	The Effectiveness of Social Media Usage within Social Movement to Reject the Reclamation of the Jakarta Bay, Indonesia	2020	academia.edu	Sodality: Journal of Rural Sociology	7
7.	Susi et al. (2023)	Big Data as a Reference for Fashion Trends; Strategy in Marketing Innovation	2023	ojs.stmik-banjarbaru.ac.id	Justisi: Scientific Journal of Informatics Engineering and Information Systems	4
8.	Angga et al. (2023)	Communication Ethics of Indonesian	2023	ejournal.undiksha.ac.id	Indonesian Journal of Philosophy	4

		Netizens on Social Media as a Democratic Space in Jurgen Habermas's Public Space Study				
9.	Ghazali (2020)	Internet Networks And Social Media In Supply Chain And Logistics	2020	ojs.stiemahardhika.ac.id	Mahardhika Media	3
10.	Purwantoro et.al (2021)	Social Media: Role and Role in Developing National Insight	2021	journal.lemhannas.go.id	Journal of the Indonesian National Resilience Institute	3

Source: Secondary Data Processing Results, 2026

Table 3 above shows that the authors named Devi Harmita, Kusman Ibrahim, and Urip Rahayu are the authors with the highest number of citations, with 15 citations, with a scientific work in the form of an article entitled “Use of Social Media to Prevent the Spread of HIV/AIDS” published in the Silampari Nursing Journal in 2022. Furthermore, scientific works that were published in full ranked 2 to 10 between 2019 and 2023 are shown in Table 3 above.

This indicates that, when associated with the research topic “Social Media Communication Opportunities in the Big Data Era,” highly cited scientific works demonstrate significant relevance and influence in the context of digital communication and health. For example, the article “The Use of Social Media to Prevent the Spread of HIV/AIDS” by Devi Harmita, Kusman Ibrahim, and Urip Rahayu demonstrates how social media is used effectively to convey important and urgent health information. In the big data era, social media serves as a powerful tool for reaching a wide audience quickly, enabling the dissemination of information that can directly impact public health behaviour.

Furthermore, Table 3 shows that from 2019 to 2023, many scientific papers focus on social media communication and how this platform can be utilised in various fields, including health, education, and politics. The increase in publications and citations shows that this topic is not only popular among academics but also relevant to practitioners in the field. Communication via social media in the era of big data offers opportunities for deeper data analysis, allowing researchers to identify trends, patterns, and communication effectiveness that were previously difficult to measure.

Finally, the relationship between high citations and research topics confirms that the use of social media in the era of big data not only expands the reach of

communication but also improves the quality and impact of scientific research. Researchers can leverage data from social media platforms to inform policies, develop more effective intervention programs, and improve digital literacy among the public. Thus, research on social media communication opportunities in the era of big data is important not only for understanding current digital dynamics but also for developing more efficient and impactful communication strategies in the future.

The ranking of other works in the table can provide additional insights into specific aspects of social media communication and its relationship to the big data era, such as social media's influence on the identification and dissemination of character values in society. The results of this study are consistent with research published by Parlina et al. (2020), which concludes that the most cited articles focus on comprehensive surveys and reviews of emerging technologies, methodologies, and applications in the field of big data. This trend underscores the importance of synthesising existing knowledge and identifying future research directions in this rapidly evolving field. Internet of Things (IoT) and Big Data are the most cited articles by Al-Fuqaha et al., showing important intersections between IoT and big data, covering supporting technologies, protocols, applications, challenges, and synergies with cloud computing.

Amid the growth of IoT and ever-increasing data collection, social media platforms are becoming a major source of big data (Aulia et al., 2023). Integrating IoT data with social media data provides a deeper understanding of user behaviour, preferences, and current trends. By combining data from IoT and social media, companies can understand their customers better (Hartatik et al., 2023). They can track user behaviour from many sources, such as online shopping patterns, social interactions, and stated or implied product preferences.

The map of scientific publications on social media communication opportunities in the big data era (2019-2023) can be analysed using VOSviewer to identify key topics, research trends, and relationships among them. VOSviewer is a visualisation software that enables bibliometric analysis of scientific publication data (Fathurrahman & Fitrah, 2023). The 156 article data were visualised through the Vos Viewer application to produce several analyses, namely: Part One, Analysis of Frequency of Appearance and Total Link Strength, as in the table and graph below:

Table 4. Frequency of Occurrence and Total Link Strength

No.	Keyword	Occurrences	Total Link Strength
1	Social media	82	91
2	Big Data	34	37
3	Communication	34	41
4	Digital	29	38
5	Information	11	18
6	Twitter	10	15
7	Sentiment Analysis	9	10
8	Brand	5	8
9	Industry 4.0	5	8
10	Instagram	5	7
11	Gen Z	4	9
12	Security	4	8
13	Content	4	7
14	Marketing	4	9
15	Cyber	4	5
16	COVID-19	3	6
17	Google	3	6
18	Hoax	3	4
19	Indonesia	3	7
20	Computer	3	5
21	Trending	3	5
22	Oh	2	2
23	Classification	2	3
24	Facebook	2	1
25	Influencers	2	2
26	Instructional Media	2	4
27	Propaganda	2	3
28	Purchase Intention	2	4
29	Smart City	2	4
30	Technology	2	1
31	Tiktok	2	2
32	Youtube	2	4

Source: Secondary Data Processing Results, 2026

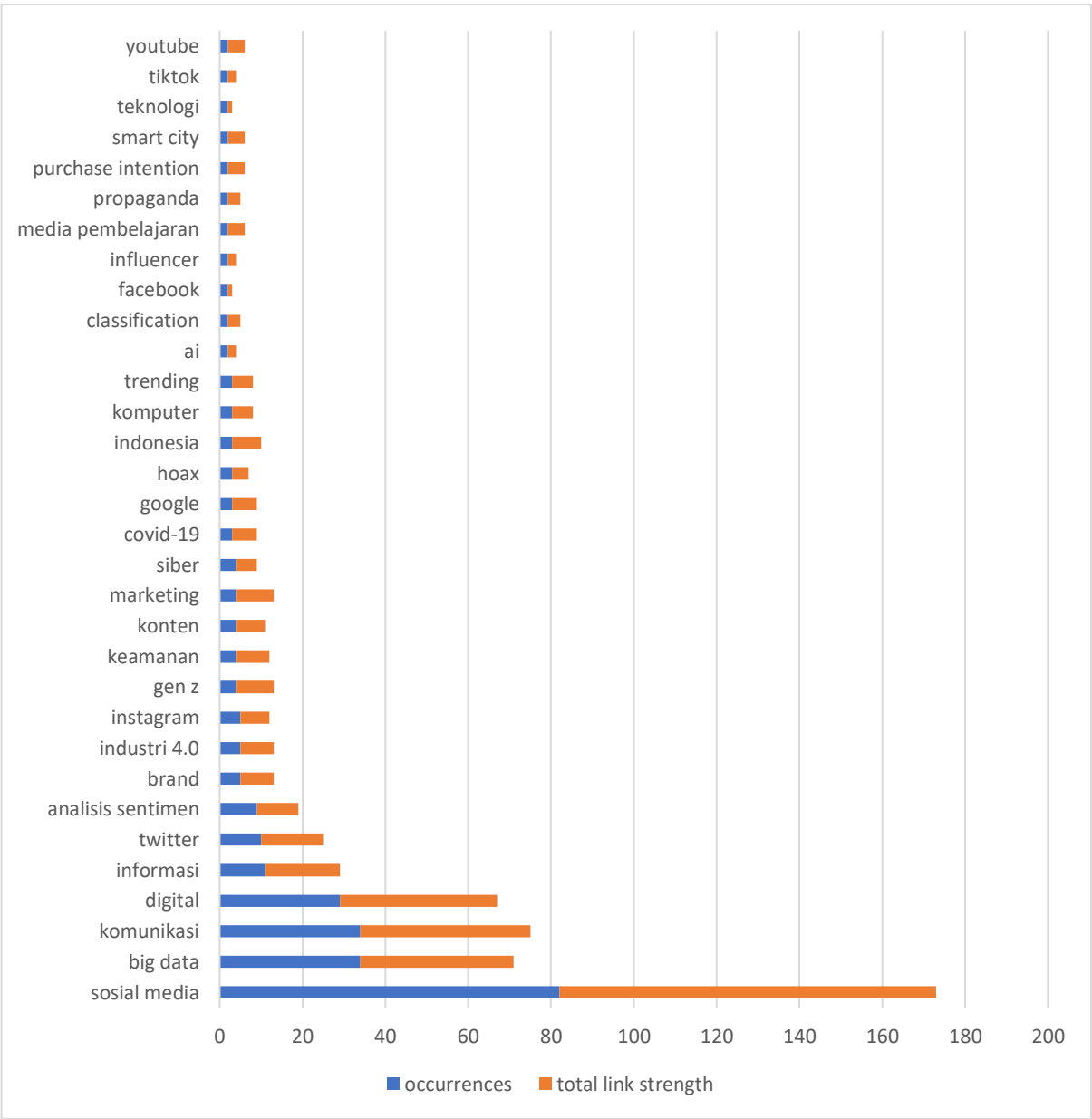


Figure 5. Frequency of Occurrence and Total Link Strength.
Source: Secondary Data Processing Results, 2026

In the images and tables shown, each keyword has two main columns: occurrence frequency and total link strength. Occurrence frequency indicates how often the keyword appears in the analysed dataset, while total link strength indicates how strongly and often the keyword is connected to other keywords. The keyword “social media” has the highest frequency of occurrence, with 82 instances and a total link strength of 91, indicating high dominance and relevance in the analysed topic.

Other keywords such as “communication,” “big data,” and “digital” also have significant link frequency and strength, indicating that these topics are frequently discussed and have strong relationships with other keywords in the network. Some keywords with lower link frequency and strength, such as “security,” “content,” and “COVID-19,” remain important in certain contexts, although they are not as popular as the main keyword. Overall, this data provides a picture of the most relevant topics and how they relate to one another in the analysed dataset, helping researchers understand the structure and dynamics of the information involved.

This indicates that, when associated with the research topic “Social Media Communication Opportunities in the Big Data Era,” keywords such as “social media,” which occur most frequently and have high link strength, indicate that social media is a central element in discussions of communication in the big data era. High frequency and high link strength indicate that social media is often the focus of research and has many connections with other topics, such as communication, big data, and digital. This shows that social media is not only popular as a research topic but also highly relevant to big data analysis, as this platform provides a rich source of data for various scientific and applied studies.

In addition, although keywords such as “security,” “content,” and “COVID-19” have lower link frequencies and strengths, they still play an important role in specific contexts. For example, security and content are crucial aspects of social media management in the big data era, as they involve protecting user data and the quality of information disseminated. Similarly, the topic of COVID-19, although less popular than the main keywords, remains relevant given its far-reaching impact on social media usage and utilisation during the pandemic. The aggregate of these data helps researchers understand the structure and dynamics of related information, identify key trends, and explore opportunities for more effective and innovative communication in the big data era.

Part Two, Network Visualisation Analysis, is a method for mapping and visualising relationships among elements in a dataset, such as keywords, authors, institutions, or publications (Soraya et al., 2023). In research, network visualisation helps researchers

understand the structure and dynamics of the data being analysed. Here are the results of the network visualisation analysis of the VOSviewer version (see Figure 6).

Figure 5 shows a visualisation of the keyword relationship network using VOSviewer. This image shows the connections and clusters between various topics relevant to “big data”, “communication”, and “social media”. So, based on the image, there are 4 clusters in different colours: Blue, Green, Red, and Orange. The Keywords in Each Cluster are: First, Blue Cluster (Social Media, Industry 4.0, Facebook, TikTok, Technology, Gen Z, Classification, Google, Content, and Hoax). Second, Green Cluster (Instagram, Influencer, and Marketing). Third, Red Cluster (Sentiment Analysis, Twitter, Information, Trending, Propaganda, COVID-19, Smart City). Fourth, Orange Cluster (Big Data, AI, Cyber, Security, and Computers). This visualisation shows the relationships among various keywords in a broader context, providing an overview of how these concepts interact in the research or analysis being conducted. Different clusters indicate closely related topic groups in the study of social media and big data.

This explains that, in relation to the research topic “Social Media Communication Opportunities in the Big Data Era,” this visualisation provides important insights into how social media functions not only as a communication platform but also as a source of large-scale data for analysis. The blue cluster that includes “social media,” “Industry 4.0,” and “technology” shows that social media is a key component in implementing the latest industrial technologies. It also reflects how social media can be used to collect data on user preferences and market trends that can support better business decisions. The green cluster that focuses on “Instagram” and “influencers” indicates the importance of marketing and individual influence in social media. This shows that digital marketing through influencers on platforms such as Instagram is an effective strategy for reaching a wider, more segmented audience.

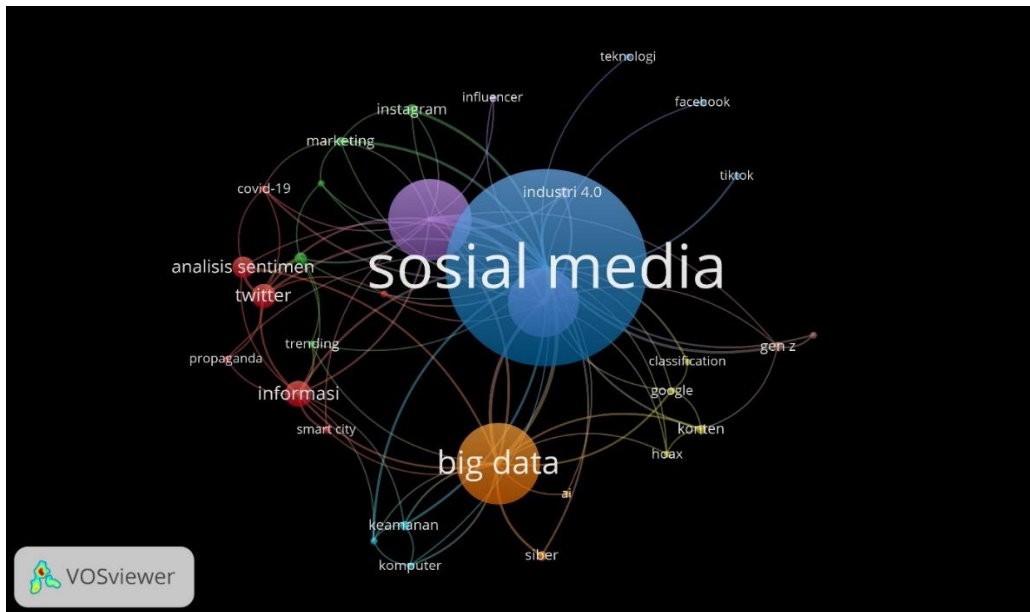


Figure 6. Network Visualization Results.
Source: Secondary Data Processing Results, 2026

Meanwhile, the red cluster covering “sentiment analysis” and “twitter” highlights the use of social media to gauge public opinion and disseminate information. Sentiment analysis on platforms such as Twitter allows researchers and businesses to understand people’s feelings and opinions on a particular issue, which can influence their communication strategies. The orange cluster shows that “big data” and related security analysis are essential to understanding and managing the risks that arise from using data at scale. This includes data protection, cyber risk analysis, and the application of AI to process and analyse big data. This visualisation clearly illustrates the complex interconnections and provides a useful framework for exploring the communication opportunities that emerge in the era of big data, helping researchers and practitioners understand how to leverage these technologies for strategic advantage in social media communication.

Part Three, Visualisation Analysis of Primary Keywords, involves analysing and displaying the relationships among keywords that frequently appear in a research dataset (Orduña-Malea & Costas, 2021). This method helps researchers identify and understand key topics and how they relate to one another in the context of the research.

Here is a detailed explanation based on the main keywords in Figure 5, namely: First, Social Media (Blue Cluster). So, Social media is the central node in the blue cluster, indicating that it is the topic most often associated with other keywords. Connections

related to social media encompass important aspects, such as “Industry 4.0,” which illustrates how social media integrates with the latest industrial technologies of the fourth industrial revolution. Popular social media platforms such as “Facebook” and “TikTok” are closely connected to this main topic, prompting research on their use. In addition, there is a relationship between social media and the development of technology and the younger generation through the keywords “Technology” and “Gen Z”. Other connections include “Classification”, “Google”, “Content”, and “Hoax”, which relate to how content on social media is classified and the problem of misinformation that arises, as well as the role of large platforms such as Google in this ecosystem.

Second, Big Data (Orange Cluster). So, Big data is central in the orange cluster, indicating that big data analysis is another major topic. Significant connections in this cluster include “AI (Artificial Intelligence)”, indicating the use of artificial intelligence in big data analysis. The topics “Cyber”, “Security”, and “Computer” indicate concerns about data security and cyber risks associated with processing large volumes of data. This cluster underscores the importance of large-scale data analysis in uncovering valuable insights while also highlighting challenges related to data security and integrity.

Third, Instagram, Influencer, Marketing (Green Cluster). So, Instagram and influencers are at the centre of the green cluster, indicating a focus on social media marketing. The keyword “Marketing” highlights the relationship between social media influencers and marketing strategies that leverage platforms such as Instagram to reach audiences. This shows that digital marketing through influencers on social media platforms is an effective strategy to reach a wider, more segmented audience and create a significant impact on consumer behaviour.

Fourth, Sentiment Analysis, Twitter, Information (Red Cluster). So, Sentiment Analysis and Twitter are central in the red cluster, indicating the use of social media for public opinion analysis. The connection with “Information”, “Trending”, and “Propaganda” indicates how information and trends can be analysed on platforms such as Twitter, including the spread of propaganda. In addition, the keywords “COVID-19” and “Smart City” illustrate how social media analysis is used to monitor the pandemic’s impact and the development of smart cities. This cluster illustrates the importance of social media as a data source for sentiment analysis and monitoring critical public issues.

Overall, the visualisation of keyword relationships in Figure 5 using VOSviewer shows four main clusters that cover important topics in social media, big data, and communication. The blue cluster places social media at the centre, connecting it to the latest technologies (Industry 4.0), popular platforms (Facebook, TikTok), and misinformation issues. The orange cluster focuses on big data, covering AI use and data

security concerns. The green cluster highlights the role of Instagram and influencers in digital marketing strategies. The red cluster highlights the importance of sentiment analysis on social media platforms like Twitter for monitoring public opinion and critical issues such as COVID-19 and smart cities. This visualisation illustrates how these topics interact and the importance of big data analysis in understanding and leveraging social media for strategic purposes.

In the study on “Social Media Communication Opportunities in the Big Data Era,” the explanation in Figure 5 provides a deep understanding of how social media plays a role in the big data era. The blue cluster highlights the importance of social media as a central hub in the modern digital ecosystem, with platforms such as Facebook and TikTok serving as focal points of interaction and key sources of data. Its connection to Industry 4.0 shows that social media functions not only as a communication tool but also as an integral part of the industrial revolution that underlies changes in how businesses and societies operate. This provides important insight into how changes in social media and technology impact communication and business in the Big Data era.

On the other hand, the orange cluster highlights the important role of big data analysis in data security and management. The integration of artificial intelligence (AI) into big data analysis shows that understanding user behaviour trends and patterns on social media is increasingly important for communication strategy. In research on social media communication opportunities in the Big Data era, understanding how big data analysis can yield deeper insights into user behaviour, market trends, and communication dynamics is key to designing an effective and responsive communication strategy. Therefore, the relationship among social media, big data, and communication strategy is an important focus of this study.

Part Four, Temporal Visualisation Analysis, is a method that focuses on changes and patterns in data over time. This method allows researchers to identify how certain topics, keywords, or trends evolve. In the context of bibliometric or scientific data analysis, temporal visualisation helps understand the dynamics of research evolution, shifts in focus, and emerging trends in a particular field of study (Wardhana et al., 2023). Below is an image of the temporal visualisation results.

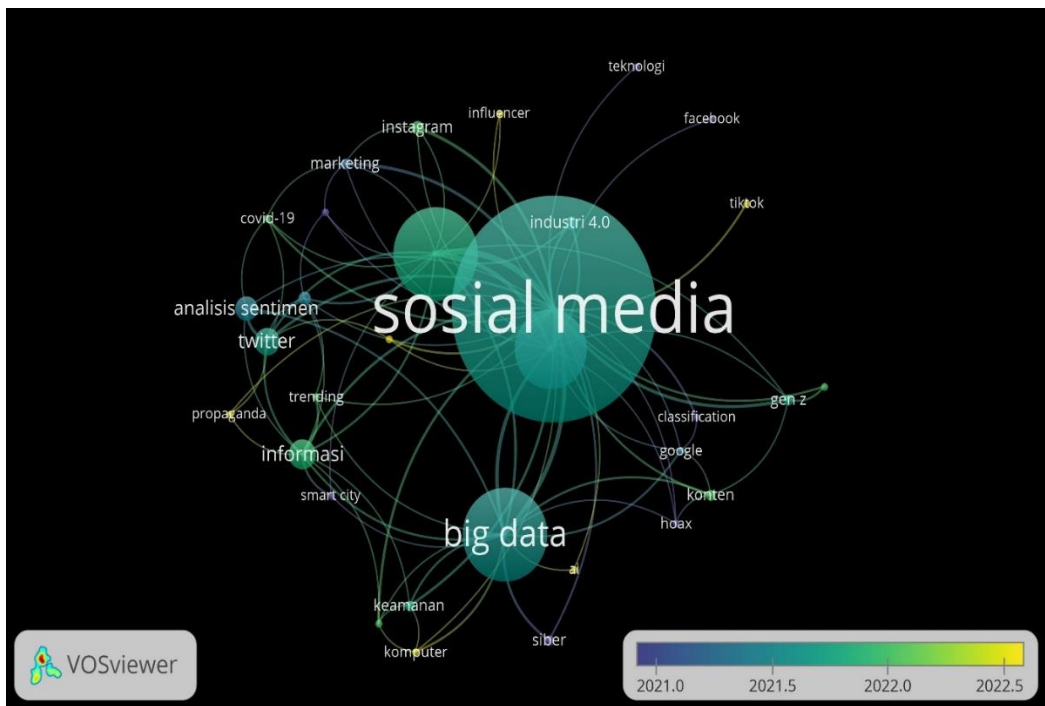


Figure 7. Overlay Visualization Results.
Source: Secondary Data Processing Results, 2026

Temporal analysis of the VOSviewer overlay figure 5 helps identify the development of topics related to “big data”, “communication”, and “social media” from 2021.0 to 2022.5. The colours in the figure indicate the time period when the keywords became more dominant or popular. The temporal visualisation in the figure provides insight into how the emergence and relevance of various terms changed over time between 2021 and mid-2022. Node colours indicate the year of emergence, with blue to dark green nodes representing terms that emerged earlier (around 2021), while light green to yellow nodes indicate terms that appeared more frequently in more recent years (2022 to mid-2022).

Terms that emerged earlier in 2021 are marked with nodes ranging from blue to dark green, such as “COVID-19,” “Twitter,” and “sentiment analysis.” These nodes indicate that these terms were already widely discussed early in the analysed period. For example, “COVID-19” in blue indicates that discussions related to this topic were more intense at the beginning of the pandemic (2021), reflecting significant attention to its impact at that time.

Terms that remained relevant throughout 2021 and 2022 are marked with green nodes. Terms such as “social media,” “big data,” and “industri 4.0” fall into this category. These nodes show that these topics experienced steady peaks in both 2021 and

2022. This indicates the continuing importance of these topics in the context of technology and social media.

Terms that started to gain more attention in 2022 are marked with light green to yellow nodes, such as “TikTok,” “Google,” and “technology.” For example, “tiktok” in yellow shows a sharp increase in discussions related to the platform in 2022. This reflects new trends and wider adoption in social media, reflecting a shift in attention to new platforms and more advanced technologies.

Overall, this visualisation provides a picture of how the relevance of social media and big data-related terms has evolved over the years. The changing colour of nodes and connectivity shows the dynamics of discussion and the shifting focus from one topic to another as trends and technologies evolve. New topics such as “TikTok” show increased relevance to pre-existing topics, while old topics such as “COVID-19” remain relevant but with a changing context.

This explains that when associated with the research topic “Social Media Communication Opportunities in the Big Data Era,” the temporal visualisation of the VOSviewer overlay image 5 provides important insights into the dynamics of the development of related topics. Through this temporal analysis, it can be identified that social media and big data not only played an important role in early 2021 but also continue to develop and adapt to evolving technological trends. For example, “COVID-19,” which dominated discussion at the beginning of the pandemic, shows how social media was used as a primary communication tool during the global crisis, providing a research opportunity to understand how digital communication facilitates the dissemination of important information and supports crisis management.

In addition, the sustained relevance of terms such as “social media,” “big data,” and “industry 4.0” throughout 2021 and into 2022 shows that the integration of social media with big data analytics remains an interesting area to explore. These opportunities include processing and analysing social media data to gain valuable insights into consumer behaviour, market trends, and public opinion. For example, sentiment analysis on platforms such as Twitter can provide real-time information on public reactions to various issues, which is invaluable for communication and marketing strategies.

Finally, the increased attention to new terms such as “TikTok” and “Google” in 2022 indicates a shift in interest and adoption of new technologies in the social media landscape. This opens up research opportunities to explore how these new platforms are changing the way we communicate and interact in the era of big data. For example, TikTok’s significant increase in discussions reflects a shift in user preferences toward short, interactive video content, unlike on previous platforms. Research can focus on

how these new formats affect communication and audience engagement strategies, as well as how data from these platforms can be leveraged for further analysis in the context of big data.

Part Five, Density Visualisation Analysis, involves examining and understanding hidden patterns, structures, and trends in data through density visualisation. It is often used in spatial data analysis, where data have geographic coordinates (McAllister et al., 2022). The goal is to identify areas of high or low density of an observed phenomenon, such as population, disease incidence, or point-of-sale. This method helps researchers identify areas of high activity or frequency in the data, as well as areas of low activity, using clear and intuitive graphical visualisations. In the context of bibliometric or scientific data analysis, density visualisation is commonly used to show the density of keywords or topics in the research literature. Below is the result of a density visualisation (see figure 8).

Figure 8 visualises the keyword relationship network using VOSviewer and shows the density of relationships among topics relevant to “big data”, “communication”, and “social media”. Density visualisation shows patterns in the data (Sudipa et al., 2023), such as high-density areas representing frequently discussed or researched topics in the context of big data, communication, and social media, and low-density areas representing rarely discussed or researched topics. The overall pattern of density visualisation reveals relationships between topics, such as topics that are frequently discussed together and those that are rarely discussed together.

This density visualisation generated by VOSviewer shows a term map that displays the relationships and frequency of occurrence of terms related to “social media”. Here is an explanation of the density visualisation analysis: First, the term “social media” is in the middle and has the highest density (bright yellow), indicating that it is the most frequent term and the centre of relationships among other terms. This shows the importance of social media in various research and discussion contexts.

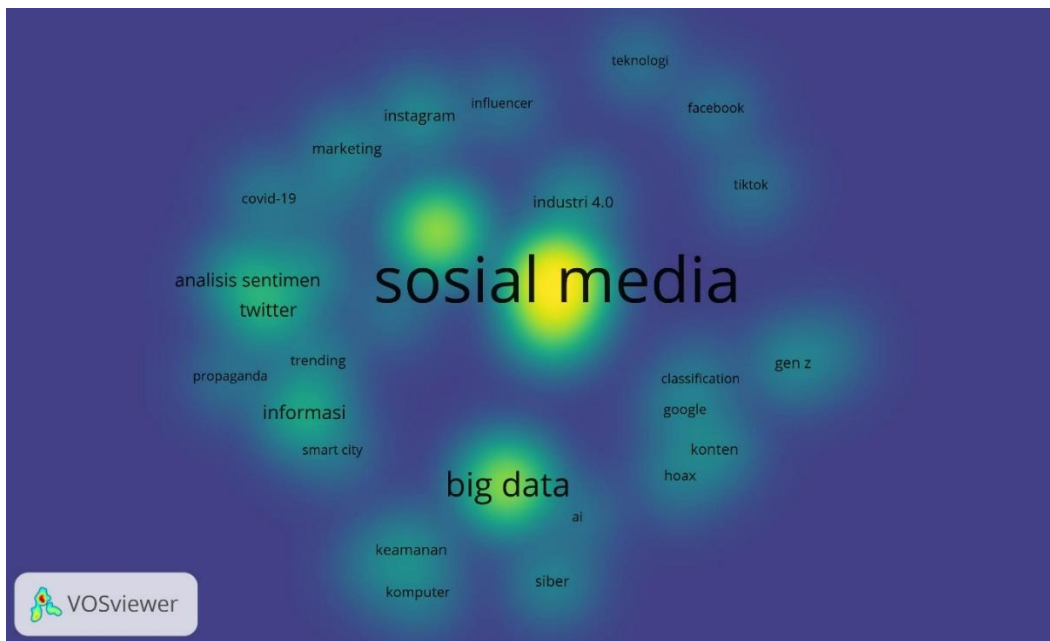


Figure 8. Density Visualization Results.
Source: Secondary Data Processing Results, 2026

Second, the term “big data” is located slightly below and has a high density (yellow), indicating that “big data” is very often associated with “social media”. This reflects the relevance of big data in the analysis and use of social media. Third, “Information” and “Twitter sentiment analysis” are located at the bottom left in yellowish green, indicating a fairly high density. This term shows the importance of information and sentiment analysis in the context of social media, which is often used to understand public opinion and trends. Fourth, “Industry 4.0” is located to the upper right of “social media” and has a medium density (green), indicating a significant relationship between social media and the Industrial Revolution 4.0. This shows how the latest industrial technology is interrelated with the development of social media. Fifth, terms such as technology, Facebook, Instagram, influencer, and marketing are positioned on the right and slightly above, indicating that these terms often appear alongside “social media”. The green colour shows a medium density, reflecting the importance of digital marketing platforms and strategies in the context of social media.

Sixth, in the top left, the term “COVID-19” shows the relationship between social media and the COVID-19 pandemic in yellowish green, indicating a relatively high density. This shows how the pandemic has affected and been affected by the use of social media. Seventh, the terms “Gen Z,” “TikTok,” “Google,” “hoax,” and “content” are

located on the bottom right of “social media”, indicating a strong relationship between social media and Generation Z, the TikTok platform, the Google search engine, content, and hoax issues. This reflects the important role of social media in the lives of the younger generation and the challenges related to misinformation. Eighth, the terms “security,” “cyber,” “computer,” and “AI” appear below “big data” and indicate a relationship with cybersecurity issues and AI (Artificial Intelligence) technology. The green colour indicates medium density, reflecting the relevance of these topics in discussions about social media. Terms such as “smart city,” “propaganda,” and “trending” are located on the left, indicating the relationship between social media and these concepts.

Overall, this visualisation illustrates how these terms relate to one another and how often they appear in research or discussions involving social media. Yellow indicates the highest density, green the medium density, and darker colours the lower density. This visualisation, associated with the research topic “Social Media Communication Opportunities in the Big Data Era,” shows that social media and big data are closely related and highly frequent. Big data plays an important role in analysing and understanding communication patterns on social media.

In addition, sentiment analysis on Twitter and other sources is an important indicator that social media can be used to understand public opinion and trends. Thus, research on social media communication in the era of big data can provide deeper insights into how information and big data interact and influence each other. In the context of Industry 4.0, the role of technology and digital platforms such as Facebook, Instagram, and TikTok is very relevant. This research can also explore how social media is used for marketing, communication, and information dissemination in this digital era, as well as how cybersecurity and AI are major concerns in the safe and effective use of social media.

Conclusion

This study shows that publications on social media communication opportunities in the big data era during 2019-2023 in the Google Scholar database increased significantly each year. The authors named Devi Harmita, Kusman Ibrahim, and Urip Rahayu are the authors who have the highest number of citations, with 15 citations, with a scientific work in the form of an article entitled “Use of Social Media to Prevent the Spread of HIV/AIDS” published in the *Silampari Nursing Journal* in 2022. The keyword “social media” has the highest frequency, with 82 occurrences and a total link strength of 91,

indicating high dominance and relevance in the analysed topic. The dominant main topics are social media, big data, and communication, indicating that this field continues to attract attention from the academic community. Visualisation analysis conducted with VOSviewer identifies relationships among key topics such as sentiment analysis, Twitter, and digital, reflecting the research focus on user behaviour and social dynamics. The use of social media and big data provides in-depth insights into user trends and behaviours, but challenges in managing and analysing big data remain. This study concludes that research on social media communication in the era of big data continues to attract researchers' interest, providing important insights for developing more effective and efficient communication strategies in the future. This shows that social media and big data are interrelated components that play an important role in understanding and utilising digital communication in the modern era.

Disclosure statement

The authors declare that there are no financial, institutional, commercial, or personal relationships that could have influenced the design, implementation, analysis, or publication of this research. This study was conducted independently using publicly available bibliometric data retrieved from Google Scholar and analysed through *Publish or Perish*, *Mendeley Desktop*, and *VOSviewer*. The authors affirm that all research procedures were performed objectively and ethically to ensure the credibility, transparency, and academic integrity of the findings.

Acknowledgement

The authors sincerely express their gratitude to the Department of Communication Science, Faculty of Social and Political Sciences, Hasanuddin University, for providing academic support throughout this research. Appreciation is also extended to the developers of *Publish or Perish*, *Mendeley Desktop*, and *VOSviewer*, whose software facilitated the collection, organisation, validation, and visualisation of bibliometric data. Finally, the authors would like to thank all researchers whose scientific publications contributed valuable references and enriched the bibliometric analysis presented in this study.

References

- Al Aziz, MR (2021). Hegel's Dialectic (Thesis-Antithesis-Synthesis) in Ethics and Philosophy of Communication in the Contemporary Era. *Journal of Communication*, 12(2), 117–122. <https://doi.org/10.31294/jkom.v12i2.10472>
- Anam, K., M Kolopaking, L., & A Kinseng, R. (2020). The Effectiveness of Social Media Usage within Social Movement to Reject the Reclamation of the Jakarta Bay, Indonesia. *Sodality: Journal of Rural Sociology*, 8(1), 64–81. <https://doi.org/10.22500/8202028955>
- Angga, S., Poa, AAP, & Rikardus, FR (2023). Communication Ethics of Indonesian Netizens on Social Media as a Democratic Space in the Study of Jurgen Habermas' Public Space. *Indonesian Journal of Philosophy*, 6(3), 384–393. <https://doi.org/https://doi.org/10.23887/jfi.v6i3.59229>
- April, N., P, MTRS, Maulina, LA, Simanjuntak, C., Novandi, R., & Radianto, DO (2024). Challenges and Business Opportunities in Entrepreneurship Development in the Maritime Sector. *Journal of Creative Management and Innovation*, 2(2), 307–319.
- Aulia, BW, Rizki, M., Prindiyana, P., & Surgana, S. (2023). The Crucial Role of Computer Networks and Databases in the Digital Era. *Justinfo | Journal of Information Systems and Information Technology*, 1(1), 9–20. <https://doi.org/10.33197/justinfo.vol1.iss1.2023.1253>
- Ayu Hapsari, NF (2020). Big Data and Its Utilization in Libraries. *Journal of Library Science (Jiper)*, 2(1), 1–11. <https://doi.org/10.31764/jiper.v2i1.2219>
- Fathurrahman, & Fitrah, M. (2023). Geogebra Software in Mathematics Learning: Literature Study. *Scientific Journal of Realistic Mathematics (JI-MR)*, 4(1), 33–40.
- Ghazali, G. (2020). Internet Networks and Social Media in Supply Chains and Logistics. *Media Mahardhika*, 18(3), 500–520. <https://doi.org/10.29062/mahardika.v18i3.213>
- Hamali, S., Riswanto, A., Sufianty, T., Handoko, Y., Sarjana, I., Saputra, D., Manafe, H., Kurniawan, S., Susanti, I., & Sarjono, H. (2023). *Management Research Methodology: Practical Guidelines for Research & Writing Scientific Papers in Management Science*. PT. Sonpedia Publishing Indonesia. <https://books.google.com/books?hl=en%5C&lr=%5C&id=mXPkEAAQBAJ%5C&oi=fnd%5C&pg=PA15%5C&dq=integrity+of+health+services+in+the+aspect+of+recruitment+of+health+workers%5C&ots=wPTsUn7Tu1%5C&sig=GjO2jCaze2pLsiHLxF7Tc2fZgbg>

- Harmita, D., Ibrahim, K., & Rahayu, U. (2022). The Use of Social Media to Prevent the Spread of HIV/AIDS. *Silampari Nursing Journal*, 5(2), 740–749. <https://doi.org/10.31539/jks.v5i2.3444>
- Hartatik, H., Kwintiana, B., Nengsih, TA, Baradja, A., Harto, B., Sudipa, IGI, & Gugat, RMD (2023). BUSINESS: Introduction & Application of Various Sectors. In PT. Sonpedia Publishing Indonesia. PT. Sonpedia Publishing Indonesia.
- Hasan Ashari, & Sancoko, B. (2021). Widyaiswara Competence in the Digital and Social Media Era. *PINUS: Journal of Learning Innovation Research*, 7(1), 11–30. <https://doi.org/10.29407/pn.v7i1.15970>
- Herawati, P., Utami, SB, & Karlina, N. (2022). Bibliometric Analysis: Development of Research and Publication on Program Coordination Using Vosviewer. *Jurnal Pustaka Budaya*, 9(1), 1–8. <https://doi.org/10.31849/pb.v9i1.8599>
- Humah, D., & Hi Hi Abdullah, BM (2023). Constitutional Guarantee of the Right to Association in Article 28 of the 1945 Constitution Hijacked by Perppu No. 2 of 2017. *Journal of Law and Society*, 17(2), 2. <https://doi.org/10.44633/an-nizam.v17i2.1181>
- Ifadhila, AYREE et al. (2024). Digital Marketing in the Era of Society 5.0. PT. Sonpedia Publishing Indonesia.
- Jin, X., Xu, Z., & Hua, Y. (2024). Analysis of news communication strategies in the era of full media based on big data mining. *Applied Mathematics and Nonlinear Sciences*, 9(1), 1–13. <https://doi.org/10.2478/amns.2023.1.00069>
- Krishna, N., Sari, AGT, Ardabilli, MT, Muara, J., & Junchu, Y. (2023). Organizational Sustainability: Bibliometric Review and Research Agenda. *International Journal of Economics and Management Review*, 1(1), 1–8. <https://doi.org/10.58765/ijemr.v1i1.68>
- Kurdi, MS, & Kurdi, MS (2021). Bibliometric Analysis in Educational Research: Theory and Implementation. *Journal on Education*, 3(4), 518–537. <https://doi.org/10.31004/joe.v3i4.2858>
- Kusuma, AC, & Rahmani, AD (2022). Legal Analysis of Data Leaks in Banking Systems in Indonesia (Case Study of Data Leaks at Bank Indonesia). *Supremasi: Journal of Law*, 5(1), 46–63. <https://doi.org/10.36441/supremasi.v5i1.721>
- Lai, H. (2023). Development of Social Media in Different Countries Media Revolution in the Era of Big Data. *Lecture Notes in Educational Psychology and Public Media*, 4(1), 1054–1060. <https://doi.org/10.54254/2753-7048/4/2022779>
- Machmuda, A., Burhanudin, MA, Ahman, E., & Mulyadi, H. (2022). Teaching Factory In Vocational Highschool: Bibliometric Analysis. *Undiksha Journal of Economic Education*, 14(1), 63–71. <https://doi.org/10.23887/jjpe.v14i1.42385>

- Marín-Marín, J. A., López-Belmonte, J., Fernández-Campoy, J. M., & Romero-Rodríguez, J. M. (2019). Big data in education. A bibliometric review. *Social Sciences*, 8(8). <https://doi.org/10.3390/socsci8080223>
- McAllister, J. T., Lennertz, L., & Atencio Mojica, Z. (2022). Mapping A Discipline: A Guide to Using VOSviewer for Bibliometric and Visual Analysis. *Science and Technology Libraries*, 41(3), 319–348. <https://doi.org/10.1080/0194262X.2021.1991547>
- Muhammad, I., & Triansyah, FA (2023). Complete Guide to BIBLIOMETRIC Analysis with VOSviewer. Adab Publisher.
- Nazwa Salsabila Lubis, & Muhammad Irwan Padli Nasution. (2023). The Development of Information Technology and Its Impact on Society. *Multidisciplinary Journal of Science and Technology*, 01(12), 21–30.
- Nugroho, FP, Abdullah, RW, Wulandari, S., & Hanafi. (2019). Big Data Security in the Digital Era in Indonesia. *Informa Journal*, 5(1), 28–34.
- Orduña-Malea, E., & Costas, R. (2021). Link-based approach to studying scientific software usage: the case of VOSviewer. *Scientometrics*, 126(9), 8153–8186. <https://doi.org/10.1007/s11192-021-04082-y>
- Parlina, A., Ramli, K., & Murfi, H. (2020). Theme mapping and bibliometrics analysis of a decade of big data research in the Scopus database. *Information (Switzerland)*, 11(2), 1–26. <https://doi.org/10.3390/info11020069>
- Peng, Q., & Ye, X. (2021). Research Trends in Social Media/Big Data with the Emphasis on Data Collection and Data Management: A Bibliometric Analysis. *Empowering Human Dynamics Research with Social Media and Geospatial Data Analytics*, 4(3), 47–63. https://doi.org/10.1007/978-3-030-83010-6_4
- Rini, PP, Dahila, I., Suherman, S., & Sholih, S. (2024). New Perspectives in Educational Management: Addressing Contemporary Issues with a Multidisciplinary Approach. *Pendas: Scientific Journal of Elementary Education*, 9(2), 3236–3247.
- Sahib, NSM, Idayanti, S., & ... (2023). Problems of Electronic System Organizer (PSE) Regulations in Indonesia. *Pancasakti Law Journal* ..., 1(1), 61–74. <https://doi.org/10.24905/plj.v1i1.8>
- Saito, T., & Gupta, S. (2022). Big data applications with theoretical models and social media in financial management. *Annals of Operations Research*, 336(3), 1–23. <https://doi.org/10.1007/s10479-022-05136-x>
- Sandra, R., Zebua, Y., Khairunnisa, MP, Pd, S., Hartatik, MC, Si, S., Pariyadi, MS, Kom Dessy, M., Wahyuningtyas, P., Pd, M., Ahmad, M., & Thantawi, ST (2023). Artificial Intelligence (Ai) Phenomenon (Issue June). PT. Sonpedia Publishing Indonesia. www.researchgate.net

- Septa, S., & Hoirul, H. (2022). The Role of Big Data in the Trade Industry Sector: A Literature Review of Office Companies. *Journal of Office Administration: Education and Practice*, 2(3), 198–210. <https://doi.org/10.26740/joaep.v2n3.p198-210>
- Soraya, SM, Kurjono, K., & Muhammad, I. (2023). Bibliometric Analysis: Research on Digital Literacy and Learning Outcomes in the Scopus Database (2009-2023). *EDUKASIA: Journal of Education and Learning*, 4(1), 387–398. <https://doi.org/10.62775/edukasia.v4i1.270>
- Subekti, D. (2022). The Communication in Social Media About COVID-19 Vaccine: Mapping and Bibliometrics Analysis Communication in Social Media About COVID-19 Vaccine: Mapping and 1 Master of Government Affairs and Administration, Universitas Muhammadiyah Yogyakarta, 1 Spe. Aristo, 10(2), 232–252.
- Sudipa, IGI, Sarasvananda, IBG, Hartatik, Prayitno, H., Putra, INTA, Darmawan, R., & Atmodjo, D. (2023). Data Visualization Techniques. In First Edition. Pt Sonpedia Publishing Indonesia. PT. Sonpedia Publishing Indonesia. https://www.google.co.id/books/edition/Teknik_Visualisasi_Data/LjC4EAAQBAJ?hl=id&gbpv=1&dq=visualisasi data&pg=PA5&printsec=frontcover
- Susi, N., Sugiana, S., Rahayu, A., Wibowo, LA, & Widjajanta, B. (2023). Big Data as a Reference for Fashion Trends; Strategy in Marketing Innovation. *Justisi: Scientific Journal of Informatics Engineering and Information Systems*, 12(2), 637–646. <http://ojs.stmik-banjarbaru.ac.id/index.php/jutisi/article/view/1232>
- Susilo Adi Purwanto, Riyadi Syahardani, Erwin Hermawan, Aang Kuvaeni, & Indarti. (2021). Social Media: Role and Role in Developing National Insight. *Journal of the Indonesian National Resilience Institute*, 9(4), 55–79. <https://doi.org/10.55960/jlri.v9i4.416>
- Tamarasari, L., Kurniawati, Mulyati, D., Windy, O., Kurnia, E., & Banirohim, G. (2021). The Role of Social Media Communication Created by Companies, Social Media Communication Created by Users on Purchase Intention Mediated by Brand Passion. *Scientific Journal of Management and Business*, 22(2), 304–318. <http://jurnal.umsu.ac.id/index.php/mbisnis304-318>
- Thoha, PM, Kurniawan, RP, & Faristiana, AR (2023). Changes in Parental Communication to Children in the Digital Era. *Student Scientific Creativity Journal*, 1(4), 415–431. <https://doi.org/10.55606/sscj-amik.v1i4.1682>
- Wardhana, AWP, Salim, TA, & Sugihartati, R. (2023). Bibliometric analysis of publication trends on audiovisual preservation research topics in the Scopus database in 2018–2023 using VOSviewer. *Al-Kuttab: Journal of Library, Information and Archive Studies*, 5(2), 1–12. <https://doi.org/10.24952/ktb.v5i2.9495>