

BIG DATA IN POLITICAL COMMUNICATION: GLOBAL TRENDS, THEMATIC CLUSTERS, AND RESEARCH GAPS FROM A SYSTEMATIC REVIEW

BIG DATA NA COMUNICAÇÃO POLÍTICA: TENDÊNCIAS GLOBAIS, GRUPOS TEMÁTICOS E LACUNAS DE PESQUISA A PARTIR DE UMA REVISÃO SISTEMÁTICA

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Abstract

The convergence of big data and political communication has arisen as an important research subject in the digital age, providing both benefits and challenges to democratic processes. While big data allows for more tailored and data-driven political campaigns, it also raises questions about transparency, deception, and democratic accountability. Despite growing scholarly attention, the area remains divided across disciplines and geographically centered in Western contexts, resulting in considerable gaps in the literature. This work tackles these gaps by doing a Systematic Literature Review (SLR) in accordance with the PRISMA 2020 recommendations and combining it with bibliometric analysis using VOSviewer. A total of 45 publications published between 2019 and 2024 were examined to identify research trends,

Resumo

A convergência entre big data e comunicação política surgiu como um importante tema de pesquisa na era digital, trazendo tanto benefícios quanto desafios para os processos democráticos. Embora o big data permita campanhas políticas mais personalizadas e baseadas em dados, ele também levanta questões sobre transparência, engano e responsabilidade democrática. Apesar da crescente atenção acadêmica, a área permanece fragmentada entre disciplinas e geograficamente centrada em contextos ocidentais, resultando em lacunas consideráveis na literatura. Este trabalho aborda essas lacunas por meio de uma Revisão Sistemática da Literatura (RSL) de acordo com as recomendações do PRISMA 2020, combinada com uma análise bibliométrica utilizando o



thematic clusters, institutional contributions, and regional distributions. The findings indicate four main insights: (1) publication trends have increased significantly since 2015, with notable increases during the COVID-19 pandemic; (2) research is dominated by the United States and Spain, creating a potential Western-centric bias; (3) leading contributions come from a limited number of universities, indicating the need for broader collaboration networks; and (4) the field is inherently interdisciplinary, with social sciences as the dominant discipline but increasingly complemented by non-Western cultures, emergent platforms like TikTok, and the ethical implications of algorithmic governance. This study, which uses SLR and bibliometric methodologies, presents a comprehensive overview of the area, identifies existing gaps, and outlines future possibilities for expanding theory and practice in big data and political communication.

Keywords: Big Data. Political Communication. Systematic Literature Review. Bibliometric Analysis. PRISMA.

VOSviewer. Um total de 45 publicações lançadas entre 2019 e 2024 foi examinado para identificar tendências de pesquisa, agrupamentos temáticos, contribuições institucionais e distribuições regionais. Os resultados indicam quatro insights principais: (1) as tendências de publicação aumentaram significativamente desde 2015, com aumentos notáveis durante a pandemia da COVID-19; (2) a pesquisa é dominada pelos Estados Unidos e pela Espanha, criando um potencial viés ocidentalocêntrico; (3) as principais contribuições provêm de um número limitado de universidades, indicando a necessidade de redes de colaboração mais amplas; e (4) o campo é inerentemente interdisciplinar, com as ciências sociais como disciplina dominante, mas cada vez mais complementadas pela comunicação. O estudo enfoca temas pouco estudados, como culturas não ocidentais, plataformas emergentes como o TikTok e as implicações éticas da governança algorítmica. Este estudo, que utiliza metodologias de revisão sistemática da literatura (SLR) e bibliométricas, apresenta uma visão geral abrangente da área, identifica lacunas existentes e delinea possibilidades futuras para expandir a teoria e a prática em big data e comunicação política.

Palavras-chave: Big Data. Comunicação Política. Revisão Sistemática da Literatura. Análise Bibliométrica. PRISMA.

1 INTRODUCTION

The digital transformation of society has radically altered political communication, with big data emerging as a key engine of change. Big data, defined by its volume, velocity, and variety, allows political actors, governments, media institutions, and citizens to participate in novel kinds of communication and impact (Kitchin, 2014). The growing reliance on computational platforms has enabled political campaigns to target voters with unprecedented precision, posing both opportunities and problems to democratic processes. High-profile incidents like the Cambridge Analytica scandal showed how personal data may be used for political gain, raising arguments about privacy, transparency, and responsibility in the digital age (Isaak & Hanna, 2018). In this

setting, big data is both a technological resource and a political force that influences power dynamics and participation.

Over the last decade, there has been a considerable increase in research into big data and political communication. Early contributions concentrated on philosophical arguments regarding how the datafication of society alters political processes (boyd & Crawford, 2012; Couldry & Yu, 2018). Recent scholarship has emphasized methodological innovation, with the emergence of computational social science, machine learning, and large-scale automated content analysis (Dubois & Ford, 2015; Theocharis & Jungherr, 2021). These methodologies have paved the door for new research into digital footprints, campaign strategies, and political speech patterns. For example, scientists have employed big data methodologies to investigate how social media platforms influence agenda-setting, polarization, and voter participation (Casero-Ripollés, 2021; Hu & Kearney, 2021).

A large corpus of research emphasizes the dual function of big data in political communication as both a facilitator of democratic engagement and a possible danger to democratic integrity. On the one hand, data-driven techniques enable more tailored communication between politicians and public, increasing responsiveness and engagement (Jungherr, 2016). On the other hand, data manipulation for targeted misinformation and the spread of disinformation campaigns endanger public trust (Harsin, 2021; Tufekci, 2014). The COVID-19 pandemic led to increased reliance on digital platforms and big data analytics for crisis communication (García-Orosa, 2021).

Despite increased scholarly attention, the area remains divided across disciplines and geographical contexts. Although social sciences have dominated the study agenda, computer science, political science, and sociology have all made significant contributions (Theocharis & Jungherr, 2021). The majority of articles come from Western contexts, primarily the United States and Europe, with very few contributions from Asia, Africa, and Latin America (Casero-Ripollés, 2021). This concentration creates worries that theoretical frameworks and empirical discoveries may overemphasize Western democracies' sociopolitical reality, leaving non-Western processes unexplored.

Another problem is the absence of a comprehensive synthesis of the broad body of material. Individual studies provide useful insights into specific themes—such as algorithmic governance, social media campaigning, or post-truth politics—but there is

little effort to synthesize data, identify underlying trends, and map the area holistically. Existing reviews frequently focus on certain elements of the topic or rely solely on qualitative synthesis, without using quantitative methodologies such as bibliometric analysis (Moher, Liberati, Tetzlaff, & Altman, 2009; Page *et al.*, 2021).

To close these gaps, this study conducts a systematic literature review (SLR) utilizing the PRISMA framework (Moher, Liberati, Tetzlaff, & Altman, 2009; Page *et al.*, 2021) and bibliometric analysis with VOSviewer. This combined approach ensures methodological rigor and analytical depth. SLR offers a transparent and reproducible methodology for discovering and synthesizing relevant studies, whereas bibliometric analysis enables quantitative mapping of research trends, networks, and theme clusters. Together, these methodologies provide a comprehensive picture of how big data and political communication have been framed and investigated across disciplines and locations.

This article adds to the literature in three major ways. First, it presents a comprehensive review of the evolution of scholarship on big data and political communication from 2019 through 2024. Second, it determines the geographical, institutional, and topic distribution of research, emphasizing the dominance of some contexts and the lack of others. Third, it identifies underexplored topics and future study prospects, such as the importance of new platforms like TikTok in political communication, the impact of big data on non-Western democracies, and the ethical implications of algorithmic decision-making. By filling these gaps, the study not only synthesizes the existing level of knowledge but also lays the groundwork for future theoretical and methodological innovations in the subject.

2 RESEARCH METHODS

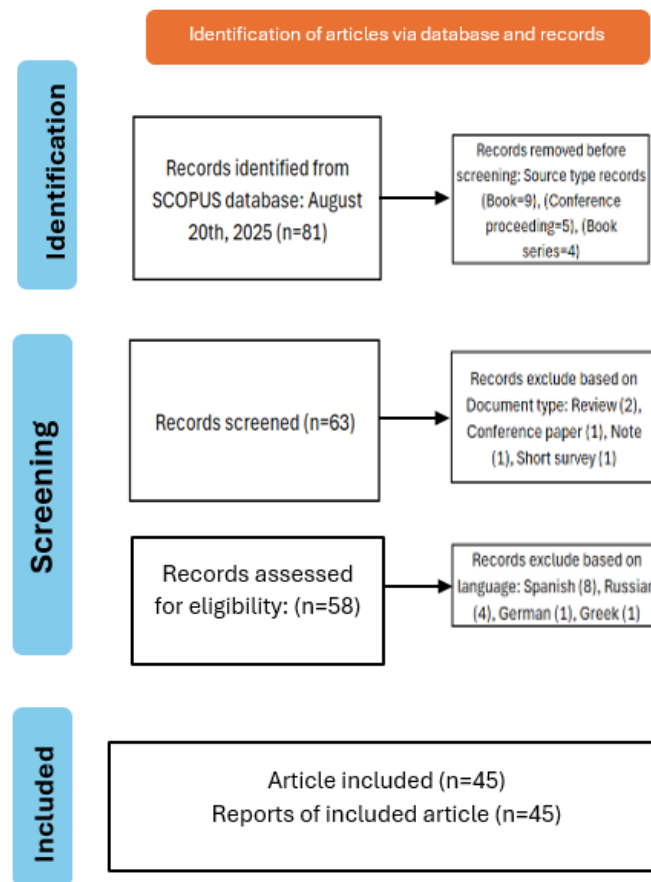
This study applies the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) framework to ensure a transparent, systematic, and reproducible process in identifying, screening, and synthesizing relevant literature. The use of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) in conducting a systematic literature review serves as an international standard guideline to ensure that the review process is transparent, systematic, and replicable.

PRISMA emphasizes four main stages—identification, screening, eligibility, and inclusion—which assist researchers in objectively filtering literature, minimizing bias, and clarifying the reporting flow. Consequently, PRISMA enhances the validity, traceability, and credibility of review findings, making it the gold standard in academic research across disciplines (Moher, Liberati, Tetzlaff, Altman, *et al.*, 2009; Page *et al.*, 2021).

The inclusion criteria set were: (1) articles published until August 20, 2025, (2) publications in English, and (3) focusing on the topic of big data and political communication in Indonesia. Bibliometric analysis was conducted using VOSViewer to see research trends related to Big Data and Political Communication, including how these two topics relate to other topics and current issues that are the focus of research that are relevant to these two keywords.

The preliminary phase in this scholarly examination involves the selection of keywords which can be accomplished through a macro methodology (top-down), progressing from expansive search trajectories to narrowly defined studies and topics. Consequently, after evaluating the limitations inherent in prior research and the scarcity of studies addressing big data and political communication, this investigation incorporates the keyword “big data” and “political communication” as focal points within the article’s title, abstract, and keyword sections. Furthermore, the Scopus database is employed by researchers for a myriad of investigational purposes, including the execution of literature reviews, identifying subject-matter experts, and monitoring research trends.

Data collection and article selection were conducted in accordance with the PRISMA framework, assuring transparency and replicability. Figure 1 depicts the complete approach of identification, screening, eligibility, and inclusion, demonstrating how 81 initial records were systematically filtered down to 45 articles that matched the inclusion criteria.

Figure 1*Data collection and analysis process – Prisma method*

To lead the analysis, this study developed four research questions that correspond to the aims of the systematic literature review and bibliometric mapping. The first question (RQ1) looks at how the publication trends for research on big data and political communication changed between 2019 and 2024, providing insights into the field's temporal growth. The second question (RQ2) delves into the geographical distribution of research and its implications for the dominance of specific environments in creating the discipline. The third question (RQ3) looks into whether institutions are at the forefront of expanding big data research and political communication, emphasizing collaboration networks and knowledge distribution. Finally, the fourth question (RQ4) examines the literature's subject area distribution to assess the field's multidisciplinary nature as well as its theoretical and methodological implications. Together, these research topics provide

a thorough understanding of the dynamics, gaps, and future objectives in the study of big data and political communication.

3 RESULT & DISCUSSION

3.1 Publication trends in Big Data and political communication

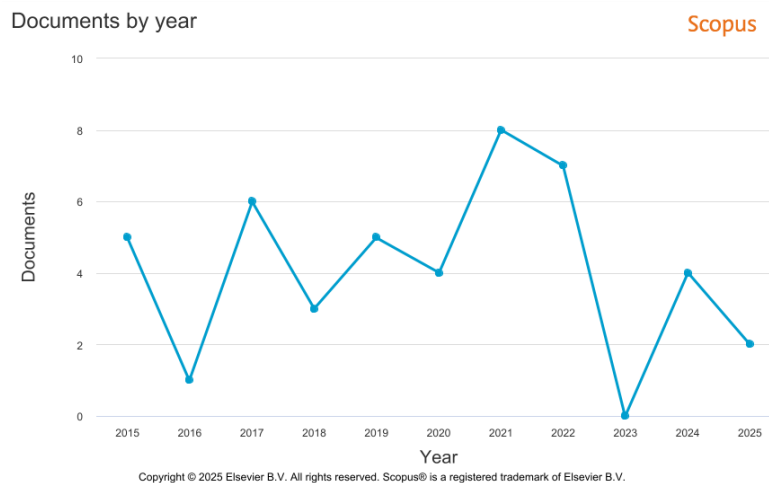
Although the concept of Big Data was introduced in 2005, its application in the context of political communication did not gain traction until 2015. As illustrated in Fig. 2, in that year, five studies highlighted how contemporary political communication research was adapting to the digital age, confronting new methodological and conceptual challenges. Methodologically, academics began adopting innovative approaches such as "trace interviews" to analyze digital footprints (Dubois & Ford, 2015) and utilizing supervised machine learning for large-scale automated content analysis (Burscher *et al.*, 2015). Conceptually, this research explored novel phenomena like "hybrid spaces" where traditional and digital media interact (Iannelli & Giglietto, 2015a), the dynamics of "problematization" in digital movements (Jensen & Bang, 2015a), and the emergence of "post-truth regimes" where political actors manage narratives through data analytics (Harsin, 2015a). While scholarly attention to this topic saw a slight dip in 2016, the number of publications sharply increased to six in 2017.

In 2021, the number of publications in this field rose significantly from 2019 and 2020 to eight, aligning with the growing relevance of data-driven political strategies during the COVID-19 pandemic and subsequent elections. Contemporary political communication studies have since shifted toward an analysis of digital platforms, which introduces new methodological and theoretical challenges. Methodologically, scholars are increasingly leveraging computational social science and big data techniques, as demonstrated by Theocharis and Jungherr (2021) who explore these methods as essential tools, and by Casero-Ripollés (2021) who uses them to identify political influencers on Twitter. This approach enables a more nuanced understanding of online political behavior, such as the gendered communication patterns on Twitter studied by Hu and Kearney (2021) and the specific campaign strategies of Catalan leaders analyzed by Díaz, del Olmo, and Velasco (Bustos Díaz *et al.*, 2021). Theoretically, this research delves into

the complexities of the digital environment, with Garcia-Orosa (2021) conceptualizing a "fourth wave" of e-democracy filled with disinformation and bots, Harsin (2021) theorizing a cultural logic of post-truth politics called "aggro-truth," and Cotter, Medeiros, Pak, and Thorson (2021) critically examining how Facebook's ad-targeting algorithms shape political discourse. These findings collectively highlight that the digital age requires innovative analytical tools and new conceptual frameworks to fully understand how technology, ideology, and social dynamics intersect in the political sphere.

Figure 2

Documents by year



3.2 Geographical distribution and global research landscape

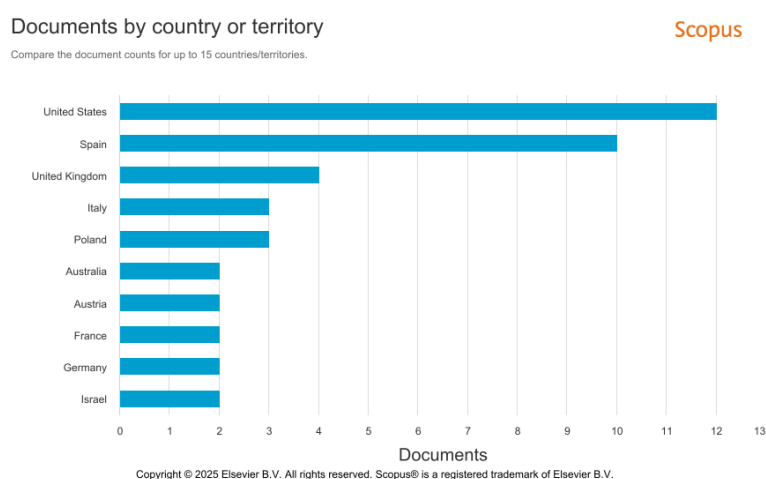
The research landscape on Big Data and Political Communication is unevenly distributed, with the United States and Spain emerging as dominant hubs, accounting for nearly half of the total publications analyzed. As shown in Fig. 3, the United States leads with 12 documents, followed by Spain with 10 documents. In contrast, countries like the United Kingdom, Italy, and Poland have fewer contributions, and several others, including Australia, France, and Germany, have only two documents each. This distribution indicates that while the topic is globally relevant, research activity is

primarily concentrated in these two nations (Casero-Ripollés, 2021; Theocharis & Jungherr, 2021).

This geographical concentration implies a potential bias in the existing literature, where findings and theoretical frameworks may disproportionately reflect the political and digital contexts of Western countries. The dominance of the United States can be attributed to its central role in technological innovation, while Spain's strong contribution may be linked to its unique political dynamics and robust research in this area (Bustos Díaz *et al.*, 2021; García-Orosa, 2021). This geographic gap presents a significant opportunity for future research, particularly in non-Western contexts, to enrich the global understanding of how Big Data influences political communication across different social and cultural systems (Cotter *et al.*, 2021; Harsin, 2021).

Figure 3

Documents by country or territory



3.3 Institutional contributions and collaboration networks

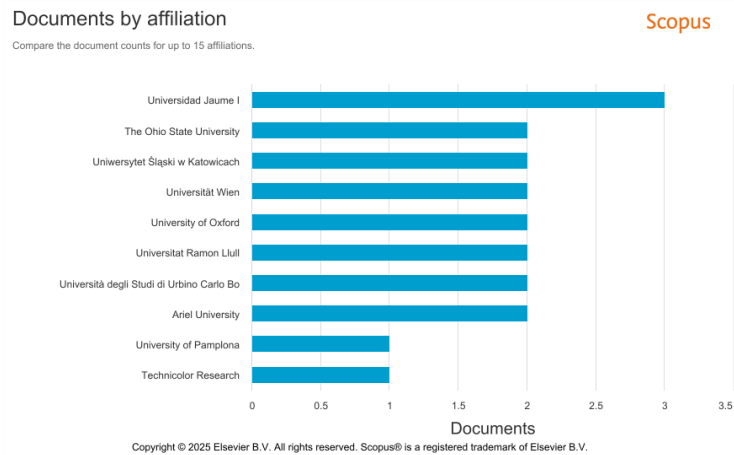
Figure 4 maps research on Big Data and Political Communication is led by a few universities with the most significant contributions. Universitat Jaume I stands out as the most productive affiliation with three documents. Seven other institutions—The Ohio State University, Uniwersytet Śląski w Katowicach, Universität Wien, University of Oxford, Universitat Ramon Llull, Università degli Studi di Urbino Carlo Bo, and Ariel University—each contributed two documents. The remaining affiliations, such as the

University of Pamplona and Technicolor Research, have more limited contributions of one document each. This concentration highlights that knowledge development in this field is highly dependent on specific research centers that have established specialized expertise and adequate research capacity (Casero-Ripollés, 2021; Theocharis & Jungherr, 2021).

The implications of this finding suggest a potential for closer collaboration among these leading institutions to accelerate innovation and broaden knowledge dissemination. Strong collaboration networks among these affiliations could be key to producing more in-depth and multidisciplinary research, which is much needed in the study of digital political communication (Iannelli & Giglietto, 2015b). Conversely, affiliations with fewer publications may face challenges in gaining visibility and influence. Therefore, building collaborative networks with leading universities could be an important strategy for institutions with minimal contributions to enhance the relevance of their research in this rapidly developing field (Cotter *et al.*, 2021; Long & Eveland, 2021).

Figure 4

Documents by affiliation



3.4 Interdisciplinary perspectives and subject area distribution

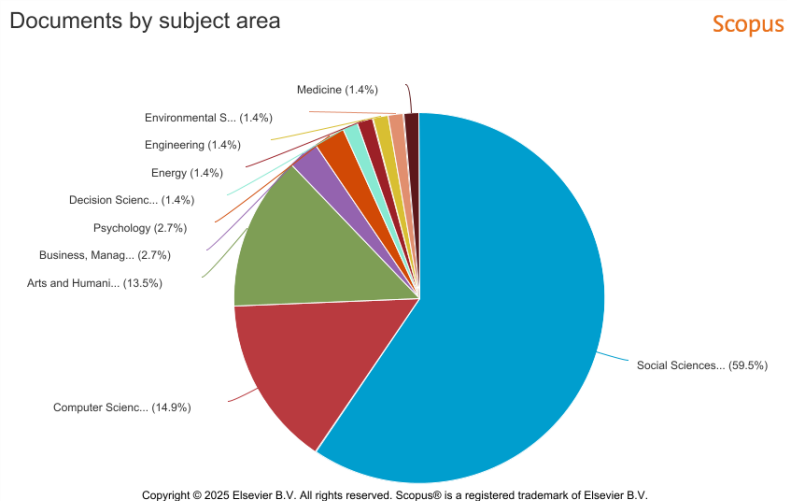
The analysis shows that research on Big Data and Political Communication is strongly interdisciplinary, though dominated by a single subject area. As depicted in Fig. 5, Social Sciences account for nearly 60% (59.5%) of the total documents, which

naturally reflects the primary focus on political and communication studies (Theocharis & Jungherr, 2021). However, significant proportions also come from Computer Science (14.9%) and Arts and Humanities (13.5%). This demonstrates that studies in this field inherently involve approaches from two distinct disciplines: Social Sciences, which provides the theoretical foundation, and Computer Science, which offers the analytical tools for processing large-scale data.

This interdisciplinary nature has important implications. The role of Computer Science indicates that research methodologies are no longer limited to traditional qualitative or survey methods but are heavily reliant on computational methods such as text and social network analysis (Hu & Kearney, 2021). Contributions from other fields like Psychology, Business and Management, and Design Science also suggest that this research incorporates diverse perspectives to understand, for instance, user behavior on social media or campaign strategies (Cotter *et al.*, 2021; Long & Eveland, 2021). Therefore, future research needs to continue fostering interdisciplinary collaboration to develop more comprehensive theoretical frameworks that integrate insights from various disciplines, enabling a richer understanding of the complexity of digital political communication.

Figure 5

Documents by subject area



4 THEMATIC STRUCTURES FROM BIBLIOMETRIC MAPPING (VOSVIEWER ANALYSIS)

4.1 Network Visualization of research themes

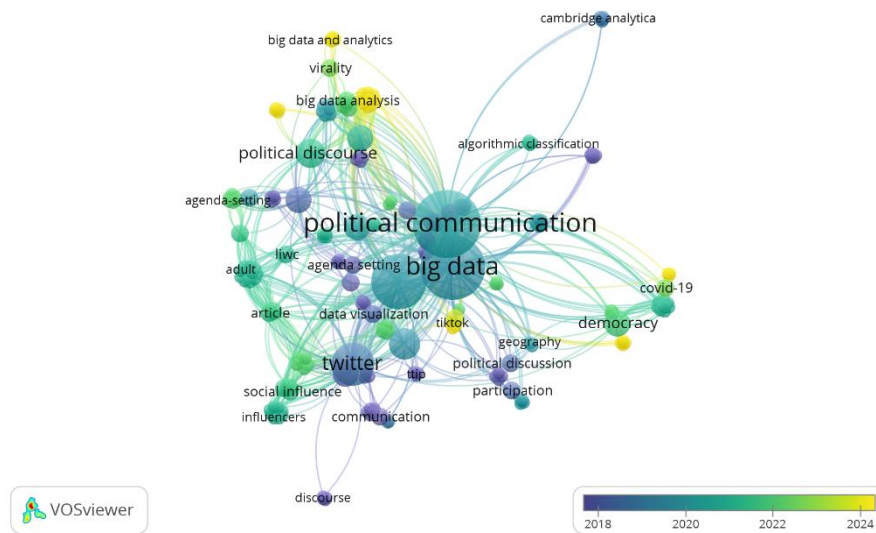
Based on the Network Visualization from VOSviewer that can be seen in Fig. 6, research on political communication and big data forms a structured network with several key thematic clusters. The largest and most central cluster is centered on political communication and big data, serving as the focal point for the integration of other topics. The other clusters reveal specific areas explored in the literature, such as the red cluster encompassing "political discourse," "big data analysis," and "virality," which highlights how researchers use big data analysis to understand the spread of political content. The orange cluster, connecting "covid-19," "democracy," and "algorithmic classification," reflects the topic's relevance in the context of global challenges like the pandemic and the role of algorithms in shaping democratic discourse (García-Orosa, 2021).

This network map also illustrates the relationships between clusters. The strong connection between the central "political communication" and "big data" cluster and topics like "twitter," "social influence," and "influencers" (the green cluster) confirms the central role of social media as a primary research platform. Meanwhile, the purple cluster containing "agenda setting" and "liwc" indicates a focus on linguistic analysis and traditional communication theoretical frameworks in digital studies (Jensen & Bang, 2015b). This visualization effectively maps the research landscape, identifying interconnected sub-themes and highlighting the shift from classic communication concepts to studies driven by data and technology (Casero-Ripollés, 2021; Theocharis & Jungherr, 2021).

events, moving from foundational exploration to more specific and responsive analyses of current political issues.

Figure 7

Overlay Visualization



4.3 Core and emerging topics in density visualization

Figure 8 depicts both research density and theme saturation. The most dense and bright area (colored yellow) is the central part, which is centered on the terms "political communication" and "big data." This density confirms that these two topics are the core of the entire analyzed literature, making them the most frequently occurring and most discussed keywords.

Surrounding this core are areas of medium density (yellowish-green) that indicate related topics often discussed together, such as "twitter," "political discourse," "big data analysis," and "agenda setting." This shows that researchers frequently use Twitter as a case study to analyze political discourse and how the public agenda is shaped through big data analysis (Hu & Kearney, 2021). The less dense areas (bluish-green) represent more specific or emerging topics, such as "covid-19," "democracy," "tiktok," and "cambridge analytica." This lower density suggests that while these topics are relevant, they may not have reached the same level of research saturation as the main core, indicating significant

linear and stable growth but rather fluctuates, indicating that although the field is relevant, it is still seeking consistent footing and direction.

Second, there is a significant geographical and institutional bias. Research is dominated by the United States and Spain, which collectively account for almost half of the total documents analyzed. This concentration is also reflected at the institutional level, where research is led by a few specific universities, such as Universitat Jaume I. This finding implies a potential bias in the available literature, where findings and theoretical frameworks may be more reflective of the political and digital contexts of Western countries. Therefore, a key recommendation for future research is to expand the geographical scope, especially with a focus on non-Western contexts, such as in Asia or Africa, to provide a richer and more globally relevant understanding of how Big Data influences political communication.

Third, the research is interdisciplinary but is still dominated by one field. The subject area analysis shows that Social Sciences dominate with a contribution of nearly 60%, although there are significant contributions from Computer Science (14.9%) and Arts and Humanities (13.5%). This reliance on Computer Science underscores the shift in research methodology from traditional methods to computational ones, such as text and social network analysis. However, the dominance of Social Sciences implies that interdisciplinary collaboration can still be improved. Future research should consciously encourage more equal collaboration between Communication/Social Sciences and Computer Science to develop more comprehensive theoretical frameworks that not only use tools from Computer Science but also integrate complementary theoretical perspectives from both fields.

Fourth, VOSviewer reveals a central focus and new research opportunities. The Network and Density visualizations clearly place "political communication" and "big data" at the core of the entire network, confirming their status as the most frequently discussed keywords. Surrounding this core are clusters representing important sub-themes like "Twitter," "political discourse," and "agenda setting". The emergence of new keywords such as "TikTok," "algorithmic classification," and "Cambridge Analytica" indicates that research is moving from foundational exploration to more specific issues and is responsive to contemporary digital political dynamics (Harsin, 2015b; Iannelli & Giglietto, 2015b). These areas, which have not yet reached research saturation, offer

significant opportunities for future researchers to make substantial and original contributions.

6 CONCLUSION

This analysis demonstrates that research on big data and political communication has expanded rapidly, particularly after 2015 and during the COVID-19 outbreak, but it remains uneven in terms of geographical distribution and institutional contributions. The field is dominated by Western cultures and the social sciences, although computational methodologies are increasingly being used, and bibliometric mapping emphasizes both existing core themes and emergent challenges such as TikTok, algorithmic governance, and disinformation. Future research should broaden its geographical scope to include non-Western contexts, strengthen interdisciplinary collaboration between communication and computer science, and pay more attention to emerging digital platforms and ethical issues, ensuring that scholarship not only advances theory but also contributes to more transparent and accountable democratic practices.

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Authors' Contribution

All authors contributed equally to the development of this article.

Data availability

All datasets relevant to this study's findings are fully available within the article.