

A Bibliometric Study of Stakeholder Opinion Mining and Sentiment Analysis in Crisis Communication

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Abstract

In the contemporary landscape, the ability to effectively manage crises and communicate with stakeholders is paramount for organizations. As the frequency and complexity of crises continue to escalate, understanding stakeholder opinions and sentiments becomes increasingly crucial for crafting timely and appropriate responses. This bibliometric study delves into the landscape of stakeholder opinion mining and sentiment analysis within crisis communication, aiming to discern trends, identify key contributors, and uncover potential gaps in the existing literature. Leveraging data from the Scopus database from 2004 to 2024, the analysis reveals a notable increase in publications over time, particularly since 2019, highlighting the growing interest in this field. The United States, the United Kingdom, and Germany emerge as leading contributors, while institutions such as The University of Texas at Austin and Universiteit van Amsterdam demonstrate significant productivity. However, limited collaboration between top institutions and authors suggests opportunities for enhanced knowledge exchange and interdisciplinary collaboration.

Keywords: Crisis Communication; Bibliometric Mapping; Opinion Mining; Sentiment Analysis; Bibliometric Review; Stakeholder Behaviour.

1. Introduction

Effective communication is a cornerstone of organisational success, permeating interactions among its members, regardless of their formal or informal nature (Rahimnia & Molavi, 2021). However, in today's dynamic digital landscape, organisational communication faces unprecedented challenges during crises, jeopardizing stakeholder relationships and operational continuity. Stakeholders, wielding significant influence, can either bolster organisational endeavors or pose substantial challenges (Degtjarjova et al., 2018). The integration of stakeholder theory with strategic thinking has long been pivotal in organising critical

information for strategic planning, enhancing the efficacy of business policies and strategies (Freeman et al., 2020).

During crises, stakeholder behaviour profoundly shapes organisational outcomes. Research underscores that stakeholders' actions are often driven by their perceptions of an organisation's response, disseminated through intricate feedback processes involving multiple stakeholders (Bosse et al., 2009; Larson, 1992). Thus, understanding stakeholder opinions and sentiments is paramount for crafting timely and effective responses. The accuracy of organisational assumptions about stakeholder behavior during crises determines the ability to avert or mitigate their impact (Alpaslan et al., 2009; Mitroff & Kilmann, 1984; Nathan & Mitroff, 1991; Pearson & Clair, 1998; Perrow, 1999; Ulmer, 2001).

Stakeholder behavior, encompassing both cooperative engagement and potential threats, offers insights into their impact on crisis response (Savage et al., 1991). This understanding empowers decision-makers to develop strategies for managing stakeholders and safeguarding organization (Mwesigwa et al., 2018; Nguyen & Rose, 2009). Furthermore, the proliferation of social media platforms and online forums has amplified stakeholders' voices, significantly influencing public perception and organisational outcomes during crises.

This study employs bibliometric analysis to discern trends in stakeholder opinion mining and sentiment analysis within crisis communication. Through this method, the research endeavors to discern pivotal trends, and detect gaps. The ultimate goal is to enrich our understanding of the evolutionary trajectory and current state of knowledge concerning stakeholder opinion mining and sentiment analysis during crises.

To conduct a comprehensive bibliometric analysis on the corpus of literature pertaining to stakeholder opinion mining and sentiment analysis within crisis communication, the following questions will be addressed:

1. **RQ1: Trend Analysis:** What are the emerging keywords and prevailing trends in the corpus of literature concerning stakeholder opinion mining and sentiment analysis in crisis communication?
2. **RQ2: Global Leadership and Collaborative Dynamics:** Which countries, scholars, and institutions are at the forefront of research on stakeholder opinion mining and sentiment analysis in crisis communication? and how do their collaborative networks contribute to the overall knowledge development?
3. **RQ3: Scholarly Impact and Collaboration Networks:** What are the prominent co-citation patterns and bibliographic coupling connections among these influential works?

2. Methodology

Bibliometric analysis, described as a collection of mathematical and statistical techniques, serves as a valuable tool to showcase the latest developments and ongoing insights within a particular research area. This method provides an efficient means to uncover the underlying intellectual framework of a research field or subject matter, facilitating a deeper understanding of its structure and trends (Molavi & Zhang, 2024).

2.1. Keywords Search

Utilising the Scopus database, our search strategy using keywords "(crisis OR covid OR pandemic) AND (opinion OR sentiment OR text) AND (communicat*)" yielded a total of 5062 documents. To curate the final collection of highly cited articles, a set of inclusion and exclusion criteria guided the selection process. Specifically, articles published between 2004 and 2024 were considered for inclusion. Additionally, the discipline of publications was restricted to areas such as engineering, decision sciences, multidisciplinary studies, accounting, social science, business, or management. Furthermore, only sources written in English were included.

After applying these criteria, a total of 1029 documents were obtained for the next step in the analysis.

3. Results

This section presents the results of the analyses utilising VOSviewer software.

3.1. Analysis of Trends in the Corpus of Literature

Fig 1 illustrates the number of papers published in the field of stakeholder opinion mining and sentiment analysis within the realm of crisis communication from 2004 to 2024. The trend analysis reveals an upward trend in the number of documents published per year. Notably, the data for the year 2024 is partially considered as the research was conducted in March 2024. Since 2019, there has been a significant increase in the number of publications, rising from 28 documents to 222 articles in 2023. Even within the first three months of 2024, 44 publications have been recorded, nearly double compared to 2015. This trend underscores the growing interest and relevance of stakeholder opinion mining and sentiment analysis in the context of crisis communication.

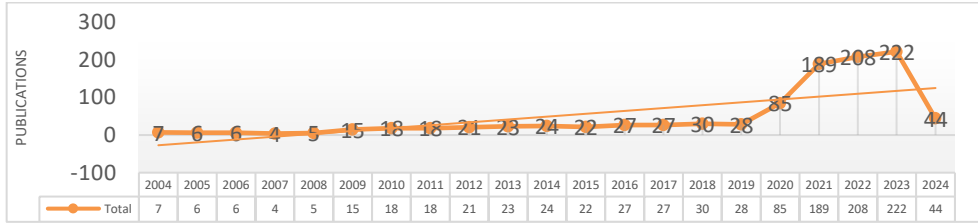


Fig 1. Trends in annual paper volume

3.2. Country-Specific Analysis

The country-specific analysis highlights the top ten countries or regions with the highest number of publications, as shown in Table 2. The United States leads with 266 documents and 5555 citations, followed by the United Kingdom with 92 documents and 1434 citations. Germany ranks third with 59 documents and 1027 citations. These findings underscore the significant contribution of these countries to documents within the analyzed dataset (Fig 2).

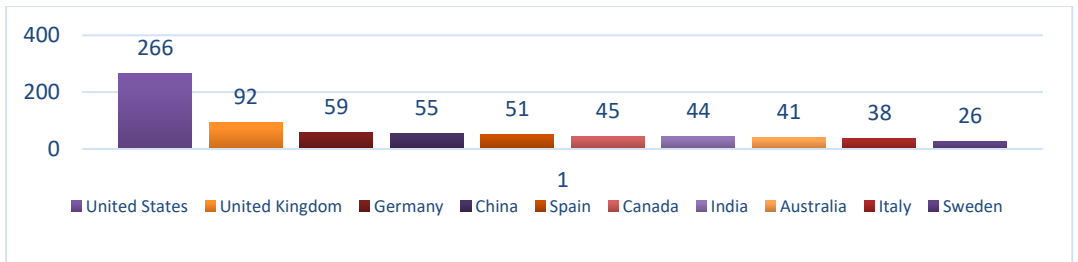


Fig 2. Top 10 article-producing countries.

3.3. Analysis of Institution's Contribution

The analysis of institutional contribution highlights The University of Texas at Austin, Universiteit van Amsterdam, and University College London as the most productive institutions. Despite their notable individual contributions, there were no partnerships or links identified between these institutions. This suggests that while these institutions are independently prolific in their research output, there is minimal or no collaboration between them.

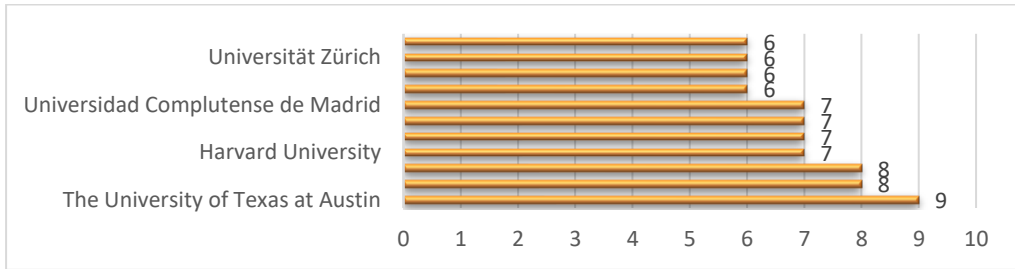


Fig 3. Top 10 Institutions' Contributions

3.4. Analysis of Leading Scholars and Collaborative Networks

Out of 2,842 authors analysed, only six met the threshold of having at least three documents each. These authors include Eisele, O. (5 documents), Arce-García, S. (3 documents), Massarani, L. (3 documents), Stieglitz, S. (3 documents), and Weber, F. (3 documents). However, there was no evidence of collaboration between these authors.

3.5. Keyword Analysis

The keyword analysis reveals the top 15 high-frequency keywords based on a minimum occurrence threshold of 40. "Covid-19" dominates with 280 mentions, followed by "social media" with 162. "Pandemic" is significant with 121 occurrences, while "crisis communication" and "coronavirus disease 2019" each appear 81 times. "Communication" is mentioned 80 times, and "public opinion" follows closely with 71 instances. Other notable terms include "interpersonal communication" (67), "epidemiology" (59), and "twitter" (45). "Public health" and "sars-cov-2" round off the list with 44 and 40 mentions, respectively.

This analysis provides insight into the most frequently mentioned keywords, highlighting the dominant themes and topics within the dataset. The emphasis on terms related to COVID-19, social media, crisis communication, and public health underscores the significant focus on these subjects.

From the extracted keywords, several conclusions and insights can be drawn regarding the prevailing themes and topics within the dataset:

1. **Dominance of COVID-19:** The high frequency of keywords such as "covid-19," "coronavirus disease 2019," and "sars-cov-2" indicates a strong emphasis on the COVID-19 pandemic.
2. **Impact of Social Media:** The prominence of "social media" as a keyword highlights the significant role of social networking platforms in shaping discourse, communication, and dissemination of information during the pandemic. The inclusion of keywords like "interpersonal communication" and "twitter" suggests a focus on interpersonal interactions and social networking platforms in the context of the pandemic. This indicates potential research or

discussions on how individuals communicate, exchange information, and engage with others during times of crisis.

3.6. Citations

As illustrated in Fig 4, the article by Norris in 2011 stands out as the most cited, amassing an impressive 1,329 citations. Following closely is Ferri's work in 2020, which has garnered 446 citations, and Kavanaugh's article from 2012 holds a substantial position with 414 citations. These citation counts highlight the significant impact and scholarly recognition that these particular articles have received within their respective fields, emphasizing their contributions to the academic discourse.

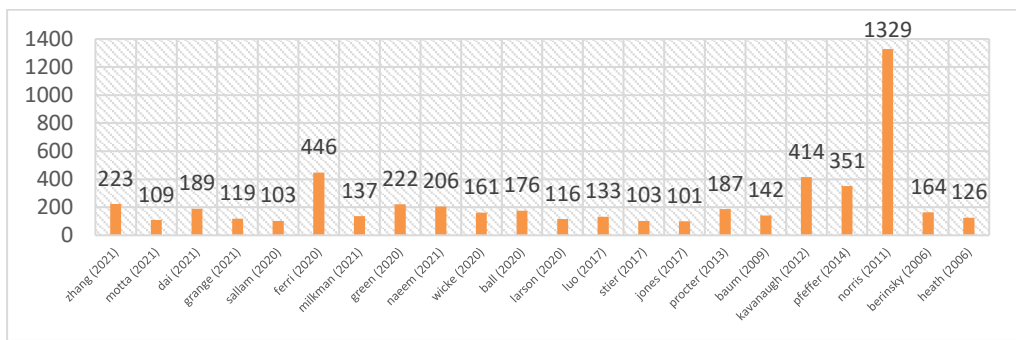


Fig4. Citations

3.7. Co-citation

Out of the 48,001 cited references, only 11 surpass the minimum citation threshold of 13. Notably, the cited references that meet or exceed this criterion vary in citation counts and total link strength. One example is the work of Benoit W.L. titled "Image Repair Discourse and Crisis Communication" published in *Public Relations Review* in 1997, which garnered 16 citations and a total link strength of 16. On the contrary, Braun and Clarke's "Using Thematic Analysis in Psychology" from *Qualitative Research in Psychology* in 2006, with 13 citations, shows a minimal total link strength of 0 (Fig5). The diversity in citation counts and link strengths among these references underscores the nuanced impact and interconnectedness within the scholarly network surrounding these specific works.

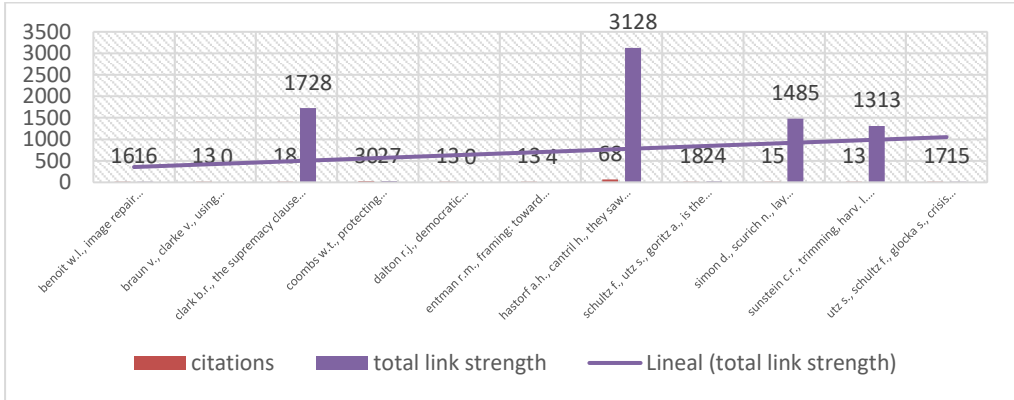


Fig 5. Co-citation

3.8. Bibliographic Coupling

The Fig 6 summarises the bibliographic coupling metrics for each organization. With four documents and 162 citations, the University of Central Florida displays a considerable level of bibliographic coupling. The high citation count suggests how many times documents from each organization cited the same third-party documents. Additionally, its total link strength of 14 indicates a strong interconnectedness among the cited documents, reflecting a cohesive research network within the institution. By examining the collaborative dynamics revealed in the analysis, researchers can identify potential partners for collaboration. Institutions with similar research interests and high bibliographic coupling metrics may benefit from collaborative efforts to further advance research in the field.

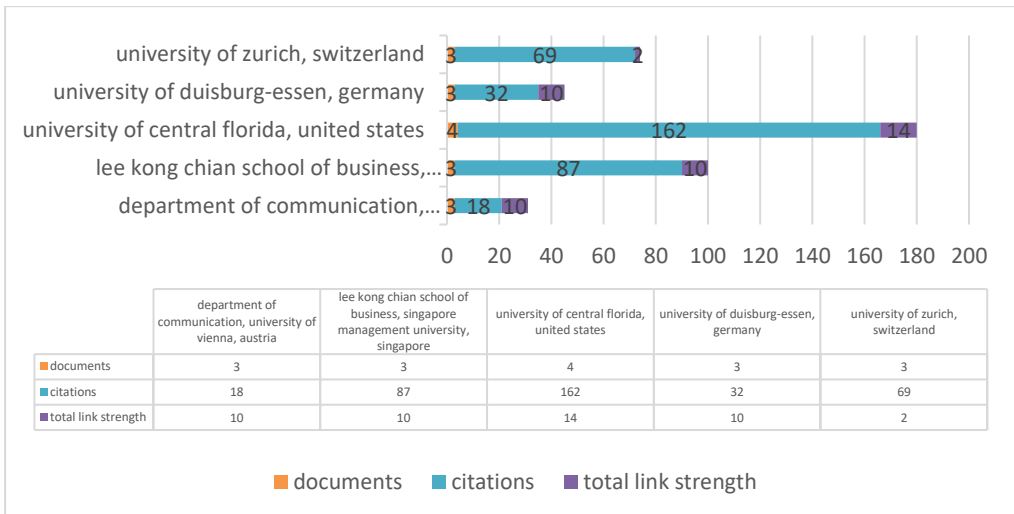


Fig 6. Bibliographic Coupling

3.9. Documents by Subject Area

The findings of the study unveiled a diverse distribution of documents across various disciplines. Among them, Social Sciences dominated with 715 documents, constituting 59.5% of the total. Following closely behind was ‘Business, Management, and Accounting’ with 222 documents, showcasing a substantial presence. Additionally, Multidisciplinary fields contributed 129 documents, while Engineering and Decision Sciences accounted for 113 and 23 documents respectively, demonstrating a varied landscape of academic inquiry. These statistics underscore the interdisciplinary nature of research and highlight the multifaceted interests within scholarly pursuits (Fig 7).

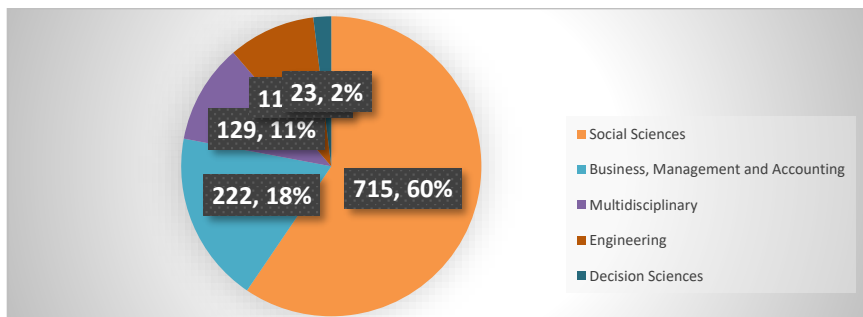


Fig 7. Documents by Subject Area

4. Discussion

RQ1: Trend Analysis

The findings of this bibliometric analysis shed light on several significant aspects of stakeholder opinion mining and sentiment analysis in the context of crisis communication. The trend analysis reveals a consistent increase in publications from 2015 to 2023, with a significant surge in 2024. This trend indicates a growing interest in stakeholder opinion mining and sentiment analysis within crisis communication, reflecting the evolving landscape of organisational communication strategies in response to crises.

The prominence of keywords related to COVID-19, social media, and crisis communication reflects current research priorities. However, the relatively low frequency of keywords related to specific stakeholder groups suggests a potential gap in understanding nuanced stakeholder dynamics within different contexts.

RQ2: Global Leadership and Collaborative Dynamics

The dominance of the United States, the United Kingdom, and Germany in publications underscores their leadership role in advancing research in this field. However, the lack of

substantial contributions from other countries suggests a potential gap in global collaboration and knowledge dissemination. While institutions like The University of Texas at Austin and Universiteit van Amsterdam demonstrate significant productivity, the absence of collaboration between top institutions indicates a missed opportunity for synergistic research efforts. Closing this gap could lead to more comprehensive and impactful insights into stakeholder opinion mining and sentiment analysis. The identification of prolific authors offers valuable insights into individual contributions, but the absence of collaborative networks among them highlights a potential gap in shared research endeavors. Fostered collaboration could lead to more innovative and comprehensive approaches to understanding stakeholder behavior during crises.

RQ3: Scholarly Impact and Collaboration Networks

While certain articles receive significant citation counts, the lack of strong co-citation patterns among seminal works may indicate a fragmented research landscape. The identification of prolific authors offers valuable insights into individual contributions, but the absence of collaborative networks among them highlights a potential gap in shared research endeavors. The presence of bibliographic coupling indicates a cohesive research network within certain institutions, such as the University of Central Florida. However, the absence of widespread coupling across institutions suggests a potential gap in knowledge exchange and collaboration, hindering the development of a unified research agenda. Strengthening connections between influential works could foster a more cohesive and integrated understanding of stakeholder opinion mining and sentiment analysis. By addressing these gaps and building on the contributions of existing research, scholars and practitioners can better navigate the complexities of crisis communication and bolster organizational resilience in an increasingly dynamic and uncertain environment.

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