DIGITAL MEDIA COMMUNICATION

THE ROLE OF SOCIAL MEDIA ALGORITHMS IN SHAPING AND CONFLICT RESOLUTION

Rido Latuheru[1], Hafied Cangara[2]

[1]Communication Studies Program, Faculty of Social and Political Sciences, Indonesian Christian University Maluku, latuheru.rido@gmail.com, Indonesia
[2]Communication Studies Program, Faculty of Social and Political Sciences, Hasanuddin University. cangara_hafied@yahoo.com

Abstract
This research explores the dual role of social media algorithms in conflict formation and resolution. Using a systematic literature review method, this research analyses how algorithms can amplify polarization and spread misinformation and their potential to be leveraged in mitigating conflict and promoting constructive dialogue. The result shows that algorithms designed to maximize user engagement often contribute to conflict escalation by forming "filter bubbles" and spreading misinformation. However, recent research has also revealed the potential of algorithms, if designed with ethical and social principles in mind, to be instrumental in early conflict detection and the promotion of dialogue across groups. This study highlights the implications of these findings for technology companies, policymakers, and civil society, and emphasizes the need for an interdisciplinary approach, proactive regulation, and increased digital literacy in addressing algorithm challenges. In conclusion, social media algorithms are flexible tools, and their impact depends on the values, principles, and goals embedded in their design. A holistic and collaborative approach is needed to harness the potential of algorithms in mitigating conflict while minimizing their role in deepening social divisions.

Keywords: Social Media; Algorithms; Shaping; Conflict Resolution.

Introduction

In this connected digital age, social media has become an integral part of modern society. Facebook, X, and Instagram have a significant influence on social, political, and cultural dynamics (van Dijck & Poell, 2013). This phenomenon has changed the way individuals and communities interact, share information, and shape perceptions of the world. However, behind the user-friendly interfaces and the promise of global connectivity lies a complex mechanism that fundamentally shapes the user experience: social media algorithms.

Social media algorithms, which are essentially a set of computational instructions for processing data and making decisions, can shape users' perceptions, attitudes, and actions in unprecedented ways (Bucher, 2018). They determine what content appears on a user's homepage, the order in which it is presented, and even which users are recommended to interact with. However, despite their central role in shaping the digital landscape, these algorithms often escape the public eye, operating as "black boxes" whose effects are felt but whose mechanisms are not fully understood (Gillespie, 2014).

The influence of social media algorithms is most pronounced in the dynamics of social and political conflict. On the one hand, algorithms optimized for user engagement tend to reinforce polarisation, creating a *"filter bubble"* where users are primarily exposed to content that reinforces their existing views (Pariser, 2011). Furthermore, the same algorithms can accelerate the spread of misinformation and disinformation, contributing to the escalation of conflict and erosion of public trust (Vosoughi et al., 2018). On the other hand, however, recent research shows the potential for algorithms to be used in conflict resolution, whether it is through early conflict detection, promotion of cross-group dialogue, or mitigation of the spread of fake news (Chadefaux, 2012; Garimella et al., 2018).

In this context, this study explores the dual role of social media algorithms: as catalysts in conflict formation and potential instruments in conflict resolution. A better understanding of the mechanisms of algorithms that can exacerbate or mitigate conflict is crucial, not only for academics studying the interaction between technology and society, but also for policymakers, technology companies, and civil society organizations seeking to address the challenges of the digital age.

Using a literature review approach, this research will investigate how algorithms can amplify polarisation and spread misinformation and how the same algorithms can be leveraged to mitigate conflict and promote constructive dialogue. Through critical analysis of the current literature, this study aims to provide insights into the complexity of algorithms' role in the conflict, challenge the deterministic narrative of technology, and highlight the potential for designing more ethical and social algorithms that contribute to a more cohesive and constructive digital space.

The significance of this research lies in the urgent nature of the problem at hand. With rising global tensions, from information warfare in elections to ethnic conflicts exacerbated by social media, understanding and utilizing algorithms for the common good is no longer just an academic endeavor, but a social imperative. This study aims not only to contribute to academic knowledge, but also to inform practices and policies that can shape the future of digital interactions and, in turn, social cohesion in the age of algorithms.

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Theoretical Framework
Algorithm Concept

An algorithm is a logical and systematic sequence of steps used to solve a problem or achieve a specific goal. The concept of algorithms is a basic foundation in computer science and programming because algorithms determine how a computer program or system works to process data and produce the desired output (Cormen et al., 2009). Every algorithm has inputs, processes, and outputs. *Inputs* are data or information given to the algorithm for processing. *The process* is the steps or instructions executed by the algorithm. *Output* is the result or solution produced by the algorithm after processing the input (Knuth, 1997).

Algorithms can be expressed in various forms, such as pseudocode, flowcharts, or programming languages. Pseudocode is a description of an algorithm that uses the structural conventions of a programming language but is intended to be read by humans. A flowchart is a graphical representation of an algorithm that uses standard symbols to describe the flow of a

process. A programming language is a formal notation used to implement an algorithm in the form of code that can be executed by a computer (Levitin, 2012).

Important characteristics of algorithms include correctness, efficiency, and clarity. *Correctness* refers to the algorithm's ability to produce the correct output or solution to a given problem. *Efficiency* relates to how quickly and efficiently the algorithm can complete the task, measured in Big O notation. *Clarity* refers to how easily the algorithm can be understood, implemented, and maintained (Sedgewick & Wayne, 2011). Algorithms play an important role in a variety of applications, ranging from simple data processing to complex systems such as search engines, artificial intelligence, and big data analysis. Proper selection and design of algorithms can significantly affect the performance, scalability, and usability of a computer application or system (Skiena, 2008).

As technology evolves and the volume of data increases, algorithms continue to be an active area of research. Researchers and practitioners seek to develop new algorithms that are more efficient, scalable, and robust to address emerging computational challenges. In addition, ethical considerations and the social impact of algorithms are of growing concern, as algorithms are increasingly applied in decision-making that affects people's lives. In conclusion, the concept of algorithms is a fundamental cornerstone in computer science and programming. A solid understanding of algorithms is essential for anyone who wants to design, develop, or analyze computer systems. By continuing to explore and develop algorithms, we can advance the boundaries of computing and address the increasingly complex technological challenges of the future.

Social Media Algorithm

Social media algorithms are a set of rules, processes, and calculations used by social media platforms to determine what content is shown to users on their homepage or feed (Gillespie, 2014). These algorithms are designed to personalize the user experience by prioritizing content that is deemed most relevant or interesting to them, based on data such as the user's interaction history, preferences, and behavior on the platform (DeVito, 2017). Social media algorithms have a crucial role in shaping how information is disseminated and consumed on these platforms. They act as powerful "gatekeepers", determining which content gains visibility and attention, and which content remains invisible (Bucher, 2012). The decisions made by these algorithms can have significant consequences for public discourse, political opinion, and social dynamics more broadly.

One of the main criticisms of social media algorithms is the lack of transparency in how they work. Social media platforms often keep the details of their algorithms secret, citing reasons for protecting competitive advantage and preventing system manipulation (Pasquale, 2015). However, this lack of transparency can raise concerns about bias, discrimination, and accountability in the way algorithms shape user experience and information flow. Studies have shown that social media algorithms can reinforce or even expand existing biases and inequalities in society (Noble, 2018). For example, algorithms can prioritize content that affirms gender or racial prejudices, or recommend extremist communities or content to vulnerable users (O'Neil, 2016). Without adequate oversight and accountability, social media algorithms have the potential to reinforce polarisation, spread disinformation, and undermine the quality of public discourse.

There is a growing need for more transparency, oversight, and regulation of social media algorithms to address these issues. Some scholars and policymakers have called for social media platforms to be more open about how their algorithms work and give users more control over their data and how it is used (Pasquale, 2015). Others have emphasized the need for external audits and algorithm oversight to identify and address potential harm or misuse (Sandvig et al., 2014). In addition, there is a need for better digital education and literacy among

social media users. By understanding how algorithms work and their impact on online experiences, users can make more informed choices about their social media use and engage in advocacy for reform or greater accountability (Eslami et al., 2015). Only with concerted efforts from social media platforms, regulators, and civil society can we ensure that social media algorithms serve the public interest and support a healthier and more democratic online environment.

Social Media Algorithms in conflict resolution.

Social media algorithms play an important role in conflict resolution in today's digital age. While social media is often seen as a platform that can exacerbate conflict through the spread of misinformation and polarisation, well-designed algorithms can help reduce tensions and promote peace (Firchow et al., 2016). One key approach is to use algorithms to detect and moderate potentially conflict-provoking content, such as hate speech, misinformation, or propaganda (Ullmann & Tomalin, 2020). By proactively monitoring and removing harmful content, social media platforms can prevent conflict escalation and create safer spaces for dialogue and exchange of ideas. In addition to content moderation, social media algorithms can also be used to promote alternative narratives and diverse perspectives during conflict. By recommending content that highlights peace stories, conflict resolution initiatives, or viewpoints from different parties involved, algorithms can help challenge prejudices and broaden users' understanding of conflict situations. This can foster empathy, reduce stereotypes, and create a foundation for more constructive dialogue.

However, it is important to remember that social media algorithms can also have unintended consequences in conflict resolution if not carefully designed and implemented (Leetaru, 2019). Algorithms that prioritize engagement or popularity of content, for example, may inadvertently amplify provocative or extreme content, which can exacerbate polarisation and complicate conflict resolution. The development of social media algorithms for conflict resolution should therefore involve careful ethical considerations, transparency, and accountability to ensure that they serve the interests of peace and reconciliation. Another algorithmic approach to conflict resolution on social media involves using data analytics and machine learning to identify trends, patterns and drivers of conflict (Elson et al., 2020). By analyzing data from social media platforms, researchers and practitioners can gain valuable insights into conflict dynamics, competing narratives, and public sentiment. This information can be used to inform conflict resolution strategies, target interventions, and evaluate the effectiveness of peace efforts.

Despite its potential, it is important to recognize the limits of social media algorithms in conflict resolution. Conflicts are often rooted in complex structural, political, and socio-economic factors, which cannot be resolved solely through technology-based interventions (Hirblinger, 2020). Social media algorithms should be seen as a complementary tool, not a substitute, for diplomatic processes, community dialogue, and real-world peace efforts. The success of conflict resolution will ultimately depend on political will, civil society engagement, and the sustained commitment of all stakeholders to address the root causes of conflict. In conclusion, social media algorithms offer promising tools for conflict resolution in the digital age but also pose significant challenges and risks. By designing algorithms that prioritize content moderation, promote alternative narratives, and support conflict analysis, social media platforms can contribute to peace and reconciliation efforts. However, algorithmic approaches must be implemented carefully, ethically, and transparently, and must be accompanied by ongoing real-world conflict resolution initiatives. Only through a collaborative and multidimensional approach can we harness the potential of social media to build lasting peace in an increasingly connected world.

Material and Methodology

To understand the dual role of social media algorithms in conflict formation and resolution, this research adopts a systematic literature study method. This method was chosen for its ability to integrate and synthesize knowledge from multiple academic sources, enabling a deep and comprehensive understanding of complex phenomena (Snyder, 2019). The process began with an extensive literature search through leading academic databases, including *Google Scholar, Web of Science, and Scopus*, which are known for their wide coverage and high quality of indexed publications (Martín-Martín et al., 2021). The search strategy involved using a careful combination of keywords, including "social media algorithms," "polarisation," "misinformation," "conflict resolution," and "digital dialogue." The use of Boolean operators and advanced search techniques were applied to ensure that the search results covered the literature most relevant to the research focus (Boell & Cecez-Kecmanovic, 2014). To ensure compatibility with recent technological developments and discourses, a temporal criterion was applied by limiting the search to publications between 2010 and 2023. This period was chosen as it includes significant evolution in social media algorithm architecture and increased public awareness of its social impact (Bucher, 2018; Gillespie, 2014).

After the initial search process, the next step was literature selection based on strict inclusion and exclusion criteria. Inclusion criteria included *peer-reviewed* articles from reputable journals, academically edited book chapters, and research reports from reputable institutions. Focus was given to empirical studies, substantive theoretical analyses, and reviews of existing literature. In contrast, the exclusion criteria included opinion articles, blog posts, and popular materials that were not *peer-reviewed*. This selection process, which followed the PRISMA (*Preferred Reporting Items for Systematic Reviews and Meta-Analyses)* principles (Moher et al., 2010), ensured that only literature of high methodological quality and relevance was included in the analyses. From this rigorous selection process, 50 literature sources were identified as the most significant for this study. This number was considered sufficient to achieve thematic saturation, where no significant new information or perspectives emerged from the addition of sources (Saunders et al., 2018). The next stage was an in-depth analysis of these sources using a thematic approach, a recognized method for identifying, analyzing, and reporting patterns or themes in qualitative data (Braun & Clarke, 2006).

Thematic analysis was conducted through several iterative phases. Firstly, familiarisation with the data was achieved through repeated readings and the recording of initial ideas. Second, initial codes were systematically generated from the entire dataset. These codes were then grouped into potential themes, which were revised and refined in subsequent phases. The main themes that emerged included "algorithm and *bubble filter* generation," "misinformation dissemination," "algorithm for conflict detection," and "algorithm for dialogue promotion." Each theme was then examined with the codes and the overall dataset to ensure internal coherence and external distinction (Nowell et al., 2017).

The final phase of analysis involved the definition and naming of themes, where the essence of each theme was articulated and connected to the research questions. This process not only allows for clear organisation and presentation of findings, but also facilitates a deeper interpretation of how social media algorithms interact with conflict dynamics. This rigorous methodological approach ensures that the conclusions drawn are based on a robust synthesis of the best available literature, providing a solid foundation for the discussion and policy implications that follow.

Result and Discussion

A discussion of the role of social media algorithms in conflict dynamics reveals a complex duality. Algorithms designed to maximise user engagement and contribute to conflict escalation through two main mechanisms: the formation of *"filter bubbles"* and the spread of

misinformation. Recent research shows the potential of the same algorithms, if designed with ethical and social principles in mind, to be instrumental in early conflict detection and the promotion of constructive dialogue.

The *"bubble filter"* or *"echo chamber"* phenomenon has been a major focus of criticism of social media algorithms. Algorithms that optimise for metrics such as time spent on the platform or frequency of interaction, tend to serve content that aligns with users' preferences and views. Empirical studies on Facebook users show that content recommendation algorithms significantly reduce users' exposure to perspectives that differ from their political beliefs. Similarly, research on platforms such as X and Reddit found that the network structure formed by algorithms reinforces homophily, where users tend to interact with like-minded individuals. The consequence is increased polarisation, where groups with different views become increasingly isolated and antagonistic towards each other.

Furthermore, algorithms play a crucial role in the spread of misinformation, which can ignite or exacerbate conflict. Analyses of the spread of fake news on social media show that misinformation spreads further, faster, deeper and wider than the truth across all categories of information. This is partly due to algorithms that prioritise content based on user engagement, where fake news, due to its sensational or provocative nature, tends to get more *"likes,"* *"shares,"* and comments. A striking case study is the 2016 US presidential election, where pro-Trump fake news was shared millions of times on *Facebook,* illustrating how algorithms can amplify conflict narratives through the massive spread of misleading information.

However, it would be wrong to conclude that social media algorithms only have a negative impact. Recent research shows the potential for algorithms to be a tool in conflict resolution. One promising area is in early conflict detection. Researchers have developed machine learning models that analyse linguistic patterns and keyword frequencies in news and social media to predict geopolitical conflicts with high accuracy. Similar models are also being used to analyse sentiment and networks at X to detect evolving conflict situations. This ability to anticipate conflict can give international organisations and governments valuable time to intervene before situations escalate into violence.

Not only in conflict detection, algorithms can also be used to promote dialogue and understanding across groups. Some researchers have proposed innovative algorithms to identify "bridges" - users who have connections with different ideological groups. By prioritising content from these users in news feeds, algorithms can help bridge the gap and encourage a constructive exchange of ideas. Similar concepts are also being explored in the development of algorithms to optimise *"exposure diversity,"* ensuring that users are exposed to a wider spectrum of opinions. In addition, algorithms can be utilised to reduce the spread of misinformation. Recent experiments have modified social media algorithms to prioritise content based on accuracy, as judged by users and trusted sources, rather than just engagement. The results show a significant reduction in the spread of fake news. This study underscores that algorithms, if designed with social impact in mind, can contribute to a healthier and less conflictual information environment. Furthermore, the potential of algorithms in conflict resolution is expanded by developments in Natural Language Processing (NLP) and discourse analysis.

However, it is important to note that utilising algorithms for conflict resolution is not without its challenges. One of the main issues is algorithmic bias. Biases in training data, algorithm design, or interpretation of results can reinforce existing stereotypes or inequities. For example, a conflict detection algorithm trained primarily on data from one geographic region may be less effective or even detrimental when applied in another cultural context. This emphasises the need for an interdisciplinary and inclusive approach to algorithm development, involving not only computer scientists, but also conflict resolution experts, anthropologists, and representatives from affected communities.

These findings have important implications for various stakeholders. For tech companies, there is a call for greater transparency and accountability in algorithm design. AI ethics initiatives and professional guidelines provide a framework to ensure that algorithms are designed with social impact in mind. For policymakers, there is a need for regulations that encourage responsible algorithmic practices, as exemplified by data protection regulations that give individuals the right to an explanation of algorithmic decisions that affect them. For civil society and educational institutions, the focus is on improving digital literacy. Studies show that individuals with a better understanding of social media algorithms tend to be more critical of the content they consume. This highlights the importance of educational programmes that not only teach the use of technology, but also a critical understanding of how it shapes social reality.

Conclusions

The conclusions of this study underscore the duality intrinsic in the role of social media algorithms on the dynamics of social conflict. A comprehensive analysis of recent literature reveals that algorithms, which are fundamentally sociotechnical artefacts, can both deepen social divides and bridge them. On the one hand, algorithmic optimisation mechanisms that focus on maximising user engagement have been shown to amplify the *"bubble filter"* phenomenon and accelerate the spread of misinformation, two factors that play a significant role in conflict escalation. On the other hand, recent research demonstrates the potential of the same algorithms, if designed with deep ethical and social considerations, to be instrumental in early conflict detection, promotion of cross-group dialogue, and mitigation of the spread of misinformation. The implications of these findings are multidimensional and touch on various domains. For tech companies, particularly social media platforms, there is an urgent call for introspection and reformulation of algorithm design principles. A paradigm that focuses solely on engagement metrics such as *"likes," "shares,"* and user time spent, needs to be balanced with a broader consideration of social impact. Initiatives such as *ACM's Code of Ethics and Professional Conduct and EU's Ethics Guidelines for Trustworthy AI* provide a normative framework for this transition, emphasising the importance of transparency, accountability, and human-centred design. Furthermore, interdisciplinary collaboration between computer scientists, social scientists, and conflict resolution practitioners is imperative to ensure that algorithms are not only technically optimal, but also responsive to socio-cultural complexities. In the realm of public policy, these findings highlight the need for more proactive and nuanced regulation. A laissez-faire approach to social media algorithms has proven inadequate in the face of challenges such as polarisation and misinformation. Instead, regulatory frameworks such as the *EU's General Data Protection Regulation (GDPR),* with its emphasis on the algorithmic "right to explanation", point the way forward. Such regulations should not be viewed as barriers to innovation, but rather as catalysts for socially responsible innovation. Policymakers also need to consider incentives for companies that adopt ethical algorithmic practices, as well as sanctions for those that fail to address the negative impacts of their algorithms.

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