

Analysis of Netizen Opinions Regarding Jokowi's Fake Diploma on Social Media

Alifian Ananda Wahyuana^{1)*}, Siska Armawati Sufa²⁾, Iwan Joko Prasetyo³⁾, Didik Sugeng Widiarto⁴⁾
^{1,2,3,4)}Faculty of Communication Science, Dr. Soetomo University, Indonesia

***Corresponding Author**

Email: alifianwahyuana001@gmail.com

Abstract

This study investigates the structural characteristics of digital polarization within Indonesia's online discourse on X (formerly Twitter) surrounding President Joko Widodo's diploma controversy. Employing a quantitative Social Network Analysis (SNA) approach, the research mapped user interactions including tweets, retweets, replies, and mentions collected during the controversy's peak from 2022 to 2023. The findings reveal a highly fragmented and polarized network dominated by a few influential accounts, particularly @abahiding, which holds the highest out-degree value (43). The network demonstrates a hub-and-spoke configuration with an average degree of 0.872, network diameter and path length of 1, graph density of 0.002, and modularity of 0.864. These indicators collectively reflect a star-like topology where communication is concentrated around central nodes and limited within ideologically homogeneous clusters. The absence of bridging actors and minimal cross group engagement further confirm the presence of echo chambers. Theoretically, these results align with public sphere, social identity, network, and polarization theories, indicating that X functions less as a deliberative space and more as a segregated arena for identity affirmation. Empirical evidence from this study confirms that the digital discourse surrounding Jokowi's diploma on X was structurally polarized, concentrated around dominant actors, and devoid of bridging mechanisms. The platform failed to support deliberative democratic functions, instead exacerbating ideological insularity and emotional partisanship. The study underscores the critical need for strategic interventions. Enhancing public digital literacy, increasing algorithmic transparency, and designing platforms that incentivize cross-group interaction are essential for mitigating public fragmentation and restoring democratic discursive capacity within Indonesia's digital ecosystem.

Keywords: Digital polarization; Social Network Analysis; Echo chambers; Political communication; Indonesia

INTRODUCTION

Education constitutes a continuous process through which individuals acquire knowledge, skills, values, and attitudes via formal instruction, training, or self-directed study. It underpins personal development and social advancement by contributing to poverty reduction, public health improvement, gender equality, and social stability. Education occurs within formal institutions as well as through non-formal and informal experiences outside classroom settings, and it spans multiple stages from early childhood through primary and secondary schooling to tertiary education each stage designed with distinct objectives to prepare learners for personal growth, employment, or further academic pursuits (Cobrief, 2025).

Joko Widodo completed his elementary education at SD Negeri 111 Tirtoyoso, continued at SMP Negeri 1 Surakarta and SMA Negeri 6 Surakarta, and subsequently enrolled in the Faculty of Forestry at Gadjah Mada University in Yogyakarta. He graduated in 1985 with a Bachelor of Forestry (S.Hut.), submitting a thesis on termite consumption patterns in decayed wood. As the first Indonesian president originating outside the conventional political and military elite, his academic formation has informed his perspectives on natural resource governance and sustainable development (Dressel & Bonoan, 2024).

Social media is an online platform or channel in the virtual world (the internet) for interacting or sending messages (sharing) to build networks (Dharma Putra et al., 2022). The dispute over President Widodo's diploma catalyzed intense public debate across Indonesia and disseminated rapidly through social media, particularly on X (formerly Twitter). What began as an ostensibly factual contention regarding academic credentials evolved into a polarized digital

discourse, in which users coalesced into opposing echo chambers, amplified antagonistic narratives, and reinforced collective identities. This pattern exemplifies a broader tendency in contemporary digital politics: online discussion rarely remains neutral and typically reflects dynamics shaped by social identity, ideological alignment, and platform-mediated curation (Karami et al., 2020; Żerebecki et al., 2021).

Figure 1. UGM's Official Statement regarding President Joko Widodo's Diploma #ijazahjokowi

X functions as a high-velocity channel for political information, enabling political actors,



media organizations, and citizens to disseminate content instantaneously and thereby influence political participation and public opinion. The platform's affordances hashtag practices, retweeting, and viral propagation facilitate rapid diffusion of political messages, mobilization of digital activism, and transnational visibility of local debates (Khaouja et al., 2025). Consequently, hashtags such as #IjazahJokowi have operated as contested digital sites where opinions circulate and crystallize into distinct camps. Empirical studies indicate that platform interactions tend to foster homophilous communication patterns, which deepen polarization as users principally engage with ideologically consonant peers (Ahmad, 2020; Diaz, 2023). The diploma controversy therefore provides a salient case for examining how political disputes materialize as structural polarization within Indonesia's online public sphere.

These technological advances have not only facilitated interaction, but also ushered in a new era of communication through the emergence of new media (Soekiman et al., 2025). Digital polarization denotes the intensification of divisions in political attitudes and identities that digital media platforms both enable and amplify. It manifests as entrenched ideological and affective separations in which groups adopt mutually exclusive and often antagonistic beliefs, thereby undermining social cohesion (Tornberg, 2022). Recent scholarship challenges the simplistic notion that polarization arises solely from users isolating themselves in homogeneous networks; instead, exposure to heterogeneous viewpoints may coexist with and even contribute to polarization through identity-based processes and adversarial interaction dynamics (Tornberg, 2022).

The emergence of digital polarization results from the interaction among emotionally salient content, algorithmic prioritization, and users' social identities. Content that provokes strong affective responses tends to spread quickly, increasing engagement while widening affective and cognitive divides. Platform algorithms further exacerbate this tendency by prioritizing sensational or divisive material to sustain user attention, thereby privileging identity affirming content over deliberative, inclusive exchanges (Overgaard & Wolley, 2022). Exposure to extreme or emotionally charged positions reinforces in group cohesion and reduces tolerance

for dissenting perspectives, which hardens social boundaries and magnifies intergroup distance. Over time, rising emotional polarization erodes moderate political culture, entrenches partisan cleavages, and increases the risk of social conflict and democratic destabilization as issues assume sharper ideological valence (Overgaard & Wolley, 2022).

Netizen opinion comprises the views, comments, and evaluative expressions that internet users articulate within online forums, social media platforms, and blogs. Participants in these spaces actively shape public discourse by disseminating endorsements, critiques, and interpretations of social and political matters (Zhang et al., 2023). Discussion of President Widodo's alleged diploma irregularity illustrates pronounced polarization driven by political motivations, limited information literacy, and prevalent confirmation bias. Some actors interpret the controversy as a politically motivated effort to discredit the president, particularly in electoral contexts, while others treat it as corroboration of institutional failings and grounds for questioning leadership legitimacy.

Algorithmic curation compounds these divisions by preferentially presenting content that aligns with users' preexisting beliefs, thereby reinforcing confirmation bias and ideological insulation (Obia, 2023). Deficits in public understanding of academic verification processes and declining institutional trust render certain audiences more receptive to conspiratorial explanations, even after official clarifications from Gadjah Mada University and government authorities affirmed the diploma's authenticity. The online debate involves a range of actors: oppositional activists and anti-government influencers who promulgate accusatory narratives; pro-government volunteers and supporters who dismiss the issue as an unfounded hoax; formal institutions such as UGM and the General Elections Commission that issue official statements; and politically unaffiliated netizens who engage without strong partisan alignment. Accusatory narratives typically allege an inability on the part of the president to demonstrate documentary authenticity and assert institutional complicity, whereas supportive narratives emphasize institutional clarifications and characterize the controversy as politically instrumentalized.

Confrontational interactions between opposing camps, amplified by algorithmic reinforcement and echo chamber dynamics, have sustained the controversy despite repeated institutional rebuttals. Conspiracy claims and rumor cycles frequently resurface during politically sensitive moments, reflecting diminished public trust in formal institutions and the ascendance of emotion-driven and misinformation laden discourse within Indonesia's digital environment (Suhendra & Pratiwi, 2024). Digital polarization consequently exerts a substantive effect on public perception and the quality of democratic deliberation: fragmented online communities limit exposure to dissenting perspectives, thereby biasing collective judgment, impairing objective issue assessment, and reducing confidence in institutions and social counterparts (Pastor-Galindo et al., 2020). From the vantage point of the digital public sphere, these processes constrict spaces for reasoned deliberation and align with the concept of affective publics, wherein sentiment often supersedes rational argumentation and political participation becomes reactive rather than reflective.

The literature further indicates that algorithmic personalization compounds ideological segmentation by clustering users along political affinities, which reinforces narrow and emotionally charged public perceptions and undermines the democratic function of inclusive, evidence-based dialogue (Tucker et al., 2021). Therefore, understanding digital polarization requires integrating perspectives on affective publics and algorithmic mediation to assess how digital ecosystems constrain deliberative quality and facilitate the consolidation of antagonistic narratives.

Although the diploma dispute raises empirical questions regarding documentary authenticity, the primary research concern lies in elucidating the processes through which online opinion divisions originate and persist. The controversy suggests that opinion formation often depends less on verification of factual claims than on the dynamics of polarization: users self-

organize into opposed communities, influencers amplify particular frames, and bridging actors simultaneously connect and demarcate factional boundaries (Stella et al., 2021). Despite extensive research on social media in electoral contexts, relatively few Indonesian studies apply Social Network Analysis (SNA) specifically to legitimacy controversies, leaving a gap in the quantitative mapping of how political disputes crystallize into structurally measurable fragmentation (Setianto, 2020).

This study therefore investigates the formation of interaction network structures on X in relation to the diploma controversy, traces emergent clusters and the degree of polarization among user groups, and identifies principal influencers and bridging actors that either sustain or mitigate polarized exchanges. The research confines its empirical scope to interactions on X during the controversy's peak between 2022 and 2023 and restricts geographic focus to Indonesian users to maintain contextual relevance. The study acknowledges limitations related to constrained access to platform data and application programming interfaces, and it excludes debates occurring on other social media platforms or in offline venues.

Methodologically, the study employs a quantitative SNA framework to map interaction networks, define user accounts as analytic nodes, and represent retweets, replies, mentions, and co-occurrence of hashtags as directed, weighted edges. Data collection relied on systematic scraping of tweets and associated metadata, including account identifiers, interaction types, timestamps, and relational ties, to construct a comprehensive connectivity dataset. The analysis computes centrality measures degree, betweenness, closeness, and eigenvector centrality to identify influential users, and it applies community-detection algorithms such as Louvain and Girvan Newman to delineate clusters and assess modularity. The study also quantifies structural indicators including density, assortativity, and clustering coefficients to evaluate the degree of fragmentation and the prevalence of echo-chamber structures, and it visualizes results through network graphs that highlight polarized communities, central actors, and bridging nodes.

The research contributes to scholarship on digital political communication by advancing structural insights into polarization dynamics on social media. By integrating SNA with theoretical perspectives on public spheres, social identity, network structures, and polarization, the study offers a coherent conceptual framework to explain how political conflicts consolidate and persist in algorithmically mediated environments. The findings aim to inform policymakers, electoral authorities, and platform operators by identifying critical actors, echo-chamber topologies, and fragmentation intensity, thereby supporting the design of interventions to counter disinformation, reduce the escalation of online conflicts, and enhance public digital literacy.

RESEARCH METHODS

This research employs a quantitative methodological approach using Social Network Analysis (SNA) to examine the structural patterns of digital interactions among users of the X platform (formerly Twitter) within the discourse surrounding President Joko Widodo's diploma controversy. The application of this design allows for both quantitative measurement and visual representation of user connectivity, the identification of community clusters that indicate polarization, and the detection of central actors who exert influence over the flow and direction of digital political communication. Rawlings et al. (2023) assert that this quantitative approach serves to map the structural configuration of digital relationships within political discourse, quantify influence and social cohesion through network metrics, detect communities and indicators of polarization, identify key actors involved in information dissemination, and produce visual representations that enhance the interpretive analysis of the discourse.

Rawlings et al. (2023) emphasize that rigorous empirical and structural grounding is essential for the analysis of digital social networks. Systematic collection of interaction data and

associated metadata enables researchers to construct precise network representations, track the evolution of political discourse, and identify community structures, central actors, and indicators of potential polarization. This stage constitutes a pivotal component of the data preparation pipeline, which Rawlings et al. argue directly shapes the validity and analytical precision of the network analysis that follows. Data were collected through systematic scraping of user interactions on X, including tweets, retweets, replies, mentions, and the use of specific hashtags such as #IjazahJokowi, during the height of the controversy between 2022 and 2025. The collected dataset comprised relevant metadata such as account identifiers, interaction types, timestamps, and inter-user relationships, enabling a comprehensive analysis of network connectivity and interaction dynamics.

The research team constructed the digital network by defining each user account as a node and by representing the various forms of interaction such as retweets, mentions, replies, and co-occurrence of hashtags as edges. Each edge reflected a specific relational tie that symbolized communication, endorsement, or contention between users. The network was designed as a directed and weighted graph to capture both the directionality and the intensity of engagement, providing an accurate depiction of influence patterns within the discourse.

Analytical procedures involved the computation of centrality metrics including degree, betweenness, closeness, and eigenvector centrality to identify users who hold dominant positions within the network structure. The Louvain and Girvan Newman algorithms were employed to detect communities and assess modularity values, allowing for the delineation of clusters indicative of polarization. Additional structural measures, such as density, modularity, similarity characteristics, and clustering coefficients, were calculated to evaluate the degree of network cohesion and fragmentation. The resulting data were visualized through network graphs to illustrate polarized clusters, influential users, and bridging actors who facilitate or mediate connections between distinct communities.

The population of this study comprises all Indonesian X users engaged in online discussions concerning President Joko Widodo's diploma issue. The sample was drawn from tweets, retweets, and other related interactions containing relevant hashtags or account mentions recorded during the controversy. Each user account was designated as a node of analysis, while the interactions among these accounts served as edges, forming the empirical foundation for quantitatively constructing and analyzing the structural configuration of the digital communication network.

RESULT AND DISCUSSION

The controversy surrounding President Widodo's academic diploma ignited widespread public debate throughout Indonesia and rapidly proliferated across social media platforms, particularly X (formerly Twitter). Initially emerging as a seemingly factual dispute over academic legitimacy, the issue transformed into a deeply polarized digital discourse in which users organized into antagonistic echo chambers, magnified opposing narratives, and reinforced collective ideological identities. This phenomenon reflects a broader characteristic of digital political communication, where online discussions rarely maintain neutrality and are instead shaped by social identity dynamics, ideological affiliations, and algorithmic curation processes (Karami et al., 2020; Żerebecki et al., 2021).

X operates as a high-velocity conduit for political communication, allowing political figures, media institutions, and citizens to disseminate information instantaneously and influence both political participation and public perception. The platform's distinctive features such as hashtags, retweets, and viral dissemination facilitate the rapid circulation of political content, the mobilization of digital activism, and the transnational exposure of localized debates (Khaouja et

al., 2025). In this context, hashtags like #IjazahJokowi have functioned as contested digital arenas where divergent opinions converge, circulate, and consolidate into opposing camps. Empirical research demonstrates that user interactions on such platforms often cultivate similar communication patterns, intensifying polarization as individuals primarily engage with ideologically aligned communities (Ahmad, 2020; Diaz, 2023). Consequently, the diploma controversy serves as a critical case for analyzing how political disputes manifest as structural polarization within Indonesia's online public sphere.

Digital polarization refers to the deepening of political and ideological divisions that digital media platforms both facilitate and intensify. It materializes through rigid ideological and emotional cleavages, in which opposing groups adopt mutually antagonistic positions that erode social cohesion (Tornberg, 2022). Contemporary scholarship, however, complicates the assumption that polarization arises solely from self-segregation within homogenous networks. Instead, exposure to heterogeneous viewpoints can coexist with and even exacerbate polarization through identity-driven mechanisms and adversarial patterns of interaction (Tornberg, 2022).



Figure 2. Visualization of Interaction Network on X Related to President Joko Widodo's Diploma Controversy

Table 1. Network Structural Metrics of the X Interaction Graph on the Diploma Controversy

Label	Score
Average Degree	0.872
Network Diameter	1
Graph Density	0.002
Modularity	0.864
Avg. Path Length	1

Source: SNA, 2025

The *Social Network Analysis (SNA)* of public discourse on X (Twitter) surrounding President Joko Widodo's diploma controversy reveals a strongly polarized and fragmented interaction network. The network visualization highlights a central node, @abahiding, which occupies a dominant structural position with the highest out-degree value (43), indicating that this account actively initiated interactions through mentions, replies, or retweets with many other users. In contrast, the majority of nodes exhibit minimal connectivity (degree = 1), reflecting

limited or one-way engagement. This pattern forms a hub-and-spoke topology, where a few influential users act as communication hubs while most users remain peripheral.

The Average Degree of 0.872 indicates that, on average, each user interacts with less than one other user. This low value signifies limited reciprocity and weak interconnection across the network, meaning that conversations tend to occur within confined and homogeneous communities. This confirms the existence of echo chambers, where discussions circulate only among like-minded users and lack meaningful cross group interaction.

Furthermore, both the Network Diameter and Average Path Length have a value of 1, implying that most nodes are directly connected to a central hub without intermediary paths. Such a structure suggests a star-like network, where messages are quickly disseminated within a specific group but fail to reach broader audiences. While a small diameter may indicate efficient information spread, in this case, it represents structural shallowness, as information flows are concentrated around key accounts without deeper cross community dialogue.

The Graph Density value of 0.002 reinforces the finding of extreme sparsity. Only 0.2% of all potential ties between users actually exist, indicating very limited interaction among different clusters. This extremely low density reflects a highly fragmented discourse environment, in which exchanges occur primarily within closed groups. In such a structure, exposure to diverse opinions is minimal, and narratives tend to reinforce existing group beliefs rather than promoting deliberation. If the density were higher, it would suggest a more integrated public discussion; however, the current low density confirms that ideological segregation dominates the network.

A striking result is found in the Modularity score of 0.864, which denotes a highly segmented community structure. In SNA, modularity values above 0.4 already indicate notable group separation, and values above 0.8 signify deep ideological fragmentation. This finding suggests that users are divided into distinct clusters likely representing pro-government and anti-government factions who engage primarily within their own communities and rarely interact with opposing groups. The network thus demonstrates a strong form of polarization, where structural boundaries mirror ideological divisions.

In terms of influence, Betweenness Centrality values show that most nodes have a value of 0.0, except for key nodes such as @abahiding, which occupy the role of central connectors. The predominance of zero values indicates that very few users serve as bridges between clusters. This absence of bridging nodes prevents dialogue between opposing communities and limits the diffusion of alternative viewpoints. If more nodes had higher betweenness scores, the network would exhibit greater interconnectivity and potential for consensus-building. Instead, the dominance of one central actor and the absence of intermediaries strengthen the isolation and self-reinforcement of polarized groups.

Overall, the combination of a low Average Degree (0.872), short Diameter and Path Length (1), very low Density (0.002), high Modularity (0.864), and concentrated Betweenness Centrality indicates that the network operates as a digitally fragmented public sphere. Rather than fostering deliberative interaction, it amplifies selective exposure and ideological clustering. Users are largely confined within self-reinforcing communities, confirming that the discourse surrounding the diploma issue functions less as open debate and more as a mechanism of identity affirmation. The structural properties of this network illustrate the mechanisms of online polarization: low connectivity limits exposure to differing views, high modularity reinforces group homogeneity, and the absence of bridging actors prevents the diffusion of counter-narratives.

In conclusion, these findings demonstrate that the digital discourse on X regarding President Joko Widodo's diploma controversy is structurally polarized. The network is dominated by a few key influencers, lacks integrative bridges, and exhibits strong modular segmentation features characteristic of echo chambers and fragmented political communication.

The results provide empirical support for the argument that social media interactions in controversial political issues tend to solidify existing divisions rather than bridge them, highlighting how network structure itself plays a critical role in sustaining polarization in the digital public sphere.

Discussion

The results of social network analysis of public conversations on the X (Twitter) platform related to the controversy surrounding President Joko Widodo's diploma show that the digital discourse is highly fragmented and structurally polarized. These findings reflect phenomena that have been described in public space theory, social identity theory, network theory, and polarization theory. When read integratively, these four theoretical frameworks help us understand that social media is not only a space for communication, but also an arena for identity formation and the reproduction of social boundaries in digital society.

First, from the perspective of public space theory, the results of the study show that social media, which ideally functions as a virtual public space, in this case fails to fulfill the principles of inclusivity and deliberation as formulated by Habermas (Ratnastuti et al., 2023; Wahyudi & Loilatu, 2023). The network structure, which has a very low Graph Density (0.002) and an Average Degree of only 0.872, indicates weak cross-group interaction and the dominance of one-way communication from central accounts such as @abahiding. This shows that the digital public sphere is more like an exclusive space accessible only to groups with similar views, rather than an open arena for the exchange of arguments and public rationality. Thus, the public space in the context of the controversy over the President's diploma did not develop into a deliberative space, but rather a performative space where participation was driven more by the need for political identity expression than substantive dialogue.

Second, based on social identity theory, the hub-and-spoke pattern and very high Modularity value (0.864) illustrate a strong social categorization process between pro-government and anti-government groups. Both groups form solid collective identities within their respective clusters, while asserting social distance from the opposing group. The processes of social identification and social comparison are clearly evident in interaction patterns that affirm loyalty to one's own group (in-group favoritism) and antipathy toward other groups (out-group derogation). With a minimal number of bridging nodes and a Betweenness Centrality value close to zero for the majority of nodes, cross-group communication is virtually non-existent. Conceptually, this condition is in line with the idea that social identity in the context of digital politics not only represents ideological preferences, but also forms boundaries of belonging that separate online communities emotionally and cognitively (Alfaruqy, 2022; Häßler et al., 2020).

Third, from a network theory perspective, a structure dominated by a single central node with high connectivity but without an even distribution of connectivity describes a star topology network. In the perspective of social network theory, this configuration indicates that communication occurs vertically from the center to the periphery, rather than horizontally between actors (Mukti et al., 2024; Rehatta et al., 2022). As a result, the network lacks the bridging capacity that enables the spread of ideas across communities. This pattern reinforces the finding that social media tends to strengthen homogeneous connections (bonding ties) rather than heterogeneous connections (bridging ties), thereby depriving public discourse of its deliberative depth. Mathematically, a Diameter and Path Length value of 1 indicates pseudo-efficiency in information dissemination: messages do spread quickly within certain clusters, but do not cross cluster boundaries. This reveals the paradox of modern social networks technically efficient but poor in social reach.

Fourth, these results are also in line with polarization theory, particularly regarding affective polarization as described by (Hobolt et al., 2020; Jackson et al., 2023). Polarization on social media is not merely ideological polarization, but rather an emotional expression of dislike towards other groups. In the context of the controversy surrounding the President's diploma, users

not only debated the facts, but also reinforced their respective political identities. This condition is exacerbated by algorithmic amplification and filter bubbles, which encourage users to be exposed more often to views that confirm their own beliefs (Jawad et al., 2024). High modularity values confirm the existence of echo chambers closed communication circles that reinforce group beliefs and reject counter-narratives. Socially, this contributes to declining cross-group trust and triggers extreme digital public segmentation (Wróblewski & Meler, 2024).

When linked conceptually, these four theories show that social media as a digital public space is now experiencing structural distortion: from a deliberative forum to a segregative arena. Network fragmentation shows how algorithmic mechanisms and social dynamics intertwine to reinforce polarization. Social identities formed within networks are no longer fluid, but have hardened into tribal identities that reject dialogue. As a result, the digital public sphere has lost its primary function as a commons for the production of rational discourse and has turned into an echoic arena for collective emotional expression.

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CONCLUSION

The interaction network on X during the controversy regarding President Joko Widodo's academic diploma revealed a highly fragmented and structurally polarized configuration. Applying a Social Network Analysis (SNA) approach, researchers identified a hub-and-spoke topology dominated by a single central actor, @abahiding, who held the highest out-degree value (43). Most other users exhibited one-way connections (degree = 1), indicating limited and non-reciprocal engagement within the network.

Quantitative metrics confirmed the sparsity and polarization of the network. An Average Degree of 0.872 signified minimal user connectivity. A Network Diameter and Average Path Length of 1 demonstrated that most users were directly linked to the central account, without interconnections between peripheral nodes. The Graph Density score of 0.002 indicated that only 0.2% of all potential ties were realized, highlighting the lack of structural cohesion. A Modularity value of 0.864 denoted substantial community segmentation, surpassing the conventional threshold for strong polarization.

This configuration reflects a superficial and unidirectional communication ecosystem that lacks meaningful cross-group dialogue. In this context, X fails to operate as a deliberative public sphere. Instead, it functions as a conduit for distributing entrenched political identities and reinforcing ideological boundaries.

Modularity analysis uncovered two sharply separated clusters, representing pro-government and anti-government communities. The former amplified official clarifications and questioned the political motivations behind the allegations. The latter disseminated suspicion regarding the diploma's authenticity, often accompanied by claims of conspiracy and institutional bias. The exceptionally high modularity score suggests that users primarily engaged within their own ideological communities, with minimal cross-cluster interaction. This reinforces the presence of echo chambers, where information circulates within homogeneous groups and emotional alignment deepens group polarization.

Theoretical frameworks on social identity and affective polarization help explain this dynamic. Digital engagement is shaped less by fact-based deliberation and more by expressions of group loyalty and identity reinforcement. The predominance of affective drivers over epistemic evaluation reflects a discursive environment where emotional alignment takes precedence over empirical scrutiny.

The account @abahiding functioned as the primary influencer, occupying the central role in information dissemination. However, the network exhibited a near-complete absence of bridging nodes, as evidenced by betweenness centrality values of zero for most users. This structural void eliminated inter-cluster connectors capable of fostering dialogic engagement across ideological boundaries.

Consequently, the network experienced discursive inertia: users remained confined within ideologically homogeneous circles, and key influencers reinforced in-group narratives rather than mediating cross-perspective conversations. The structure thus promoted self-reinforcing communication loops, impeding the circulation of diverse viewpoints.

Empirical evidence from this study confirms that the digital discourse surrounding Jokowi's diploma on X was structurally polarized, concentrated around dominant actors, and devoid of bridging mechanisms. The platform failed to support deliberative democratic functions, instead exacerbating ideological insularity and emotional partisanship. The study underscores the critical need for strategic interventions. Enhancing public digital literacy, increasing algorithmic transparency, and designing platforms that incentivize cross-group interaction are essential for mitigating public fragmentation and restoring democratic discursive capacity within Indonesia's digital ecosystem.

Implementing effective strategies to mitigate digital fragmentation and polarization requires multi-dimensional interventions across educational, technological, and communicative domains. Educational institutions should incorporate digital literacy into formal curricula at both secondary and tertiary levels. These programs must equip learners with competencies in identifying credible sources, verifying digital content, and understanding algorithmic logic governing content distribution across online platforms.

Governments and civil society organizations should coordinate multi-platform public education campaigns delivered via television, TikTok, YouTube, and other digital media that explain the mechanisms through which misinformation and hoaxes are constructed and disseminated. These campaigns must aim not only to inform but also to cultivate critical awareness of digital manipulation techniques.

Community-based initiatives should adopt dialogical training formats that prioritize participatory engagement over unidirectional instruction. Such formats can facilitate the internalization of democratic values and promote openness to divergent perspectives.

Independent regulatory bodies must conduct periodic audits of content-ranking algorithms, particularly those associated with politically sensitive discourse. These audits should assess algorithmic bias and detect amplification patterns of emotionally charged content. In parallel, digital platforms should ensure public transparency regarding the criteria used in curating and promoting content, including clear explanations of why specific posts or accounts appear in users' timelines.

Users must be granted granular control over personalization settings, including options to access content that falls outside of their routine preferences or ideological alignment. To foster cross-cutting engagement, platforms should develop features that algorithmically recommend high-engagement posts from ideologically divergent groups, supplemented with contextual annotations to reduce misinterpretation.

Structured dialogue forums, facilitated by neutral moderators, can further encourage inter-group communication by convening participants with opposing views in guided, respectful discussion formats. Platforms should also implement gamification mechanisms to incentivize

constructive, non-hostile interactions across ideological divides. For instance, they may reward users who engage in respectful, evidence-based discourse with those holding different viewpoints.

Collectively, these interventions represent a systemic approach to reinforcing democratic discourse in digital environments by reducing ideological isolation, increasing informational transparency, and promoting inclusive engagement.

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