E-ISSN 3048-0329 Vol. 2, Issue 3 (2025)
Doi: https://doi.org/10.37899/mjds.v2i3.202

Mahogany Journal De Social

Transformation of Social Structure in Digital Society: Analysis of Network Sociology

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Article Info

Article History:
Received: 28 August 2025
Revised: 20 September 2025
Accepted: 26 September 2025

Keywords:
Algorithmic Governance, Digital Society, Digital Solidarity, Network Sociology, Social Identity, Social Structure

Abstract

This study investigates the transformation of social structures in digital society through the perspective of network sociology. A quantitative approach was employed by integrating Social Network Analysis with survey data collected from 200 active social media users, supported by interaction data from 500 public digital accounts. The analysis examined digital interaction intensity, power distribution, digital solidarity, and structural network characteristics. The findings indicate that digital platforms have become central spaces for communication, relationship building, and collective participation while simultaneously reinforcing algorithmic inequalities and concentrated patterns of influence. Digital interactions strengthen social solidarity and facilitate the emergence of hybrid social identities that combine online and offline social roles rather than replacing traditional identities. The study contributes to the development of network sociology by demonstrating how structural network properties and individual perceptions jointly explain social transformation in the digital era. These findings provide practical insights for policymakers and platform developers to promote inclusive digital governance, strengthen digital literacy, and support more equitable participation within increasingly interconnected digital communities.

INTRODUCTION

The rapid expansion of digital technologies has fundamentally transformed contemporary social life, reshaping how individuals communicate, interact, and construct social relations. The widespread adoption of the internet, social media platforms, artificial intelligence, and data-driven communication systems has shifted human interaction from predominantly physical environments to highly networked digital spaces. This transition represents more than technological progress; it signifies a structural transformation in society itself (Loorbach, 2022; Tang et al., 2023). Recent studies argue that digital infrastructures increasingly mediate social relations, altering patterns of communication, authority, and collective behavior (Aissani et al., 2024; Cinque, 2024; Whelan, 2025). Social structures that were once largely determined by geographic proximity, institutional hierarchy, and stable group affiliations are now shaped by fluid networks of digital connectivity.

Within this transformation, the concept of *digital society* has emerged as a central framework for understanding the reconfiguration of social order. Digital society refers to a social condition in which information flows, platform architectures, and algorithmic systems become dominant mechanisms organizing interaction and participation (Haggart & Tusikov, 2023; Wong, 2025). In such environments, individuals no longer act solely as passive recipients of information but as active participants who create, distribute, and negotiate social meaning. This phenomenon reflects a shift from traditional hierarchical social structures toward decentralized yet interconnected network-based structures. However, this decentralization does not necessarily imply equality. Several scholars emphasize that digital spaces often reproduce structural asymmetries through algorithmic visibility, data ownership, and unequal access to technological resources (Barta & Andalibi, 2024; Tække, 2022; Verwiebe & Hagemann, 2024).

Theoretical explanations of these changes are strongly supported by network sociology. Unlike conventional sociological perspectives that emphasize institutions, class, or territorial communities, network sociology focuses on relational structures among actors and the patterns emerging from those relations. This perspective is increasingly relevant in the digital era because social interactions are now embedded within technological networks that influence communication pathways, influence distribution, and collective action (Raza, 2024; Shah, 2024). Social media platforms such as Instagram, X, TikTok, and YouTube function as networked arenas where interactions are structured through nodes, ties, and information flows. As a result, social structure becomes dynamic, relational, and continuously negotiated through digital engagement rather than fixed by conventional social boundaries.

The increasing relevance of network sociology can be observed in empirical phenomena across global and local contexts. Digital platforms have facilitated the emergence of new forms of solidarity, collective identity, and social mobilization. Social movements such as climate activism, digital humanitarian campaigns, and online civic participation illustrate how shared concerns can connect geographically dispersed individuals into cohesive digital communities (Campos & da Silva, 2024; Dias et al., 2022; Storozhenko et al., 2023). In Indonesia, this phenomenon is particularly visible due to rapid internet penetration and widespread social media adoption among urban youth. Online communities centered on education, entrepreneurship, religion, entertainment, and political discourse increasingly influence public opinion and collective action (Svendsen, 2022). This suggests that digital networks are not merely communication channels but active social environments where solidarity and belonging are continuously produced.

Despite these opportunities, digital transformation also generates structural contradictions. While digital media expands participation and democratizes communication, it simultaneously creates new forms of exclusion and inequality. Algorithmic governance has become a critical mechanism determining who gains visibility, influence, and access to information. Platform algorithms prioritize engagement-driven content, often amplifying sensationalism, misinformation, and polarization (Yang & Zhang, 2023; Wong, 2025). Consequently, digital participation becomes uneven, favoring actors with greater digital capital, stronger technological literacy, and higher economic resources. This condition reflects what recent scholars describe as *networked inequality*, where technological systems reinforce existing social hierarchies instead of dismantling them (Verwiebe & Hagemann, 2024).

Another major issue concerns identity formation and social trust. In traditional social structures, identity was largely embedded within relatively stable communities such as family, religion, and neighborhood networks. In digital environments, identity becomes increasingly fluid, performative, and fragmented. Users may construct multiple identities across platforms, adapting self-presentation according to

audience expectations and algorithmic incentives (Mei, 2024; Aissani et al., 2024). Such dynamics affect trust formation, social cohesion, and emotional relationships. The rise of fake news, echo chambers, and post-truth communication further complicates social interaction by weakening epistemic authority and intensifying fragmentation. Thus, digital society simultaneously creates opportunities for expanded connectivity while increasing vulnerability to disinformation and social polarization.

Recent international literature has extensively examined digital participation, algorithmic governance, platform capitalism, and digital inequality. Studies by Alencar et al. (2024) and Llorente (2021) emphasize the democratizing potential of digital participation. Meanwhile, Haggart and Tusikov (2023) highlight how data ownership restructures global power relations. Research by Barta and Andalibi (2024) explores visibility dynamics in social media, while Verwiebe and Hagemann (2024) introduce the concept of digital capital to explain unequal participation. Although these studies significantly contribute to digital sociology, most focus on macro-level technological transformations or conceptual debates regarding platform governance. Limited attention has been given to how digital interaction patterns empirically transform social structure through measurable relational configurations such as centrality, density, and network clustering.

This limitation reveals an important research gap. Existing studies often discuss digital transformation in normative or theoretical terms without integrating structural network analysis and user-level perceptions. Few studies simultaneously examine how network architecture shapes social solidarity, identity formation, and power distribution in digital society, particularly in developing countries such as Indonesia. Moreover, empirical evidence from Southeast Asia remains underrepresented in global digital sociology literature, despite the region's rapid digitalization and unique socio-cultural dynamics. This gap indicates the need for a more integrated approach capable of combining quantitative network structures with sociological interpretation of digital behavior.

The state of the art of this study lies in bridging social network analysis with contemporary digital sociology to investigate social structural transformation at both relational and experiential levels. Unlike previous studies that separately analyze network structures or social perceptions, this research integrates survey-based behavioral data with social network analysis metrics, including centrality, density, and modularity. This integration enables a more comprehensive understanding of how digital interactions produce both solidarity and structural inequality. The novelty of this study also lies in its empirical focus on Indonesian urban digital communities, providing context-specific evidence from an emerging digital society that remains underexplored in international scholarship. Therefore, this study aims to analyze how social structures are transformed within digital society through the lens of network sociology. Specifically, it investigates patterns of digital interaction, the distribution of power and access to information, and the formation of solidarity and social identity in online environments. The study contributes theoretically by extending network sociology into contemporary digital structural analysis and contributes practically by offering insights into the implications of digital transformation for social cohesion, inclusion, and equitable participation. By revealing the coexistence of connectivity and inequality, this research provides a novel framework for understanding hybrid social structures in the digital era.

METHODS

Research Design

This study employed a quantitative research design using an integrated Social Network Analysis (SNA) and survey-based approach to examine the transformation

of social structures in digital society. A quantitative design was selected because it enables systematic measurement of relational patterns, interaction intensity, and structural dynamics within digital communication networks (Wasserman & Faust, 1994). Social Network Analysis was used as the primary analytical framework because it allows social relations to be modeled as interconnected nodes and ties, making it particularly suitable for examining digital interaction structures characterized by connectivity, influence, and clustering (Borgatti et al., 2018). This approach also supports the identification of power concentration, information flow, and network cohesion in online environments.

The study adopted a descriptive-explanatory design. The descriptive component was used to map patterns of digital interaction and structural configurations, while the explanatory component aimed to interpret how these patterns influence solidarity, identity formation, and access to information in digital society. Through this design, the study examined not only interaction frequency but also the structural implications of digital connectivity on social transformation.

Research Context and Location

The research was conducted in major urban areas of Indonesia, including Jakarta, Makassar, Surabaya, and Bandung, where internet penetration and social media adoption are significantly high. These cities were selected because they represent diverse urban digital ecosystems characterized by active online participation, technological accessibility, and strong social media engagement. Indonesia provides a relevant empirical setting due to its rapid digital transformation and large population of active social media users. According to recent national digital reports, Indonesia ranks among the world's largest users of social networking platforms, making it an appropriate context for studying the evolution of digital social structures. The research focused on digital interactions occurring within major social media platforms, including X (formerly Twitter), Instagram, and YouTube. These platforms were selected because they facilitate different forms of engagement such as commenting, sharing, reposting, mentioning, and content creation, all of which generate measurable network relationships.

Data Collection Techniques

Data collection was conducted using two complementary techniques: digital interaction data extraction and online survey distribution. First, interaction data were collected through web scraping and digital crawling from publicly accessible social media accounts using NodeXL, Gephi, and Netlytic. These tools enabled the extraction of interaction variables such as mentions, replies, comments, reposts, and hashtag co-occurrences. In the SNA framework, users were treated as nodes, while interactions between users were modeled as edges.

Second, an online structured questionnaire was distributed to collect behavioral and perceptual data regarding digital participation, social identity, and solidarity. The questionnaire employed a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree), following standard survey measurement procedures in social science research (Creswell, 2018). Survey items measured three main dimensions: intensity of digital interaction, perceived power distribution in digital spaces, and digital solidarity.

Sample and Participants

The study involved 200 active social media users aged between 18 and 40 years, consistent with the demographic segment most engaged in digital interaction. Respondents were selected using purposive sampling, which is appropriate when participants must meet specific inclusion criteria (Etikan, 2016). The inclusion criteria required participants to actively use at least one social media platform for

more than three hours daily, engage regularly in online discussions, and participate in digital communities related to social, political, or cultural issues.

In addition to survey respondents, approximately 500 public social media accounts were included in the network dataset to ensure robust structural visualization and reliable network metrics. This sample size provided sufficient density and diversity to identify meaningful patterns of influence and clustering.

Table 1. Sample Characteristics of Respondents (n = 200)

Source: Primary Survey Data Processed by Authors (2025)

Data Analysis Techniques

Data analysis was conducted in two stages. First, descriptive statistical analysis was performed using SPSS to summarize respondent demographics and survey responses through frequencies, percentages, means, and standard deviations. This stage provided an overview of behavioral patterns in digital participation.

Second, Social Network Analysis was conducted using Gephi and UCINET to evaluate structural properties of digital interaction networks. Key network metrics included degree centrality, betweenness centrality, closeness centrality, network density, and modularity. Degree centrality measured interaction frequency and actor prominence, betweenness centrality identified bridging actors controlling information flow, closeness centrality assessed network accessibility, density measured overall cohesion, and modularity detected cluster formation within digital communities (Hanneman & Riddle, 2005). These metrics enabled structural interpretation of power concentration, connectivity, and fragmentation in digital society.

Validity and Reliability

To ensure methodological rigor, reliability testing was conducted on the survey instrument using Cronbach's Alpha. A threshold value above 0.70 indicated acceptable internal consistency (Hair et al., 2022). The instrument achieved satisfactory reliability across all constructs. Content validity was established through expert review in sociology and digital communication studies to ensure conceptual relevance of questionnaire items.

For network data, validity was strengthened through triangulation between automatically extracted digital data and manual verification of selected interaction patterns. Cross-platform comparison and repeated network analysis using different software tools were also performed to ensure consistency of structural findings. These procedures minimized bias and enhanced the robustness of the study's conclusions regarding digital social transformation.

RESULTS AND DISCUSSION

This section presents the empirical findings of the study regarding the transformation of social structures in digital society. To provide a systematic explanation, the findings are organized into five analytical subsections. First, the study explains respondent characteristics and overall digital participation. Second, descriptive statistics and reliability testing are presented to validate measurement quality. Third, the intensity of digital interaction is analyzed as an indicator of structural transformation. Fourth, the study examines the distribution of power and access to information in digital networks. Finally, digital solidarity and identity formation are explored to understand how online interactions shape collective belonging. In addition to survey-based findings, Social Network Analysis (SNA) metrics including centrality, density, modularity, and correlation analysis are integrated to strengthen structural interpretation.

Respondent Characteristics and Digital Participation

The study involved 200 active social media users from major urban regions in Indonesia, namely Jakarta, Makassar, Surabaya, and Bandung. These cities were selected due to their high levels of internet penetration and intensive use of digital communication platforms. The respondents consisted of 55% male and 45% female participants. In terms of age distribution, 38% were aged 18–25 years, 34% were aged 26–32 years, and 28% were aged 33–40 years.

Digital engagement among respondents was notably high. Approximately 70% reported spending more than four hours per day on social media platforms, 22% spent between two and four hours, and only 8% used social media for less than two hours daily. These findings indicate that digital platforms have become central spaces for communication, networking, and identity expression.

Table 1. Respondent Characteristics (n = 200)

Variable	Category	Percentage
Gender	Male	55%
	Female	45%
Age	18–25	38%
	26–32	34%
	33–40	28%
Daily Social Media Use	<2 hours	8%
	2–4 hours	22%
	>4 hours	70%

Source: Primary Survey Data Processed by Authors, 2025

The demographic pattern confirms that the sample represents digitally active urban populations with intensive exposure to networked communication systems.

Descriptive Statistics and Reliability Test

Before interpreting the main findings, descriptive statistical analysis and reliability testing were conducted to assess the quality of measurement instruments. The study measured three core constructs: digital interaction intensity, power distribution in digital society, and digital solidarity.

Table 2. Descriptive Statistics of Variables

Variable	Mean	SD	Min	Max
Digital Interaction	3.81	0.72	1	5
Power Distribution	3.75	0.69	1	5
Digital Solidarity	3.64	0.67	1	5

Source: Primary Survey Data Processed by Authors, 2025

The results indicate relatively high mean values across all variables, with digital interaction showing the highest average score (Mean = 3.81). Standard deviations below 1 indicate moderate variability and relatively consistent responses among participants.

Reliability testing using Cronbach's Alpha demonstrated strong internal consistency.

Table 3. Reliability Test Results

Variable	Cronbach's Alpha
Digital Interaction	0.871
Power Distribution	0.846
Digital Solidarity	0.882

Source: SPSS Output Processed by Authors, 2025

All variables exceeded the acceptable threshold of 0.70, indicating that the instrument had satisfactory reliability and was suitable for further analysis.

Intensity of Digital Interaction

The first analytical dimension concerns the intensity of digital interaction, which reflects the extent to which digital media has become central to everyday social relations.

Table 4. Intensity of Digital Interaction

Statement	Mean
I interact more often through digital media than face-to-face	3.82
My social relationships are increasingly formed through digital media	3.70
Digital interactions make it easier to build social networks	3.91

Source: Primary Survey Data Processed by Authors, 2025

The findings show consistently high scores across all indicators. The highest score (Mean = 3.91) indicates strong agreement that digital platforms facilitate network expansion. Respondents perceive digital communication as enabling efficient relationship-building beyond physical boundaries.

Similarly, the statement regarding more frequent digital interaction than face-to-face communication scored 3.82, reflecting a substantial shift in the locus of interaction from physical to virtual environments. These results suggest that digital interaction has become embedded in daily routines and now serves as a primary medium for maintaining social ties. Social Network Analysis supports this finding. The interaction map generated from 500 public accounts revealed a network density score of 0.42, indicating moderate-to-high connectivity among users. This suggests that digital networks facilitate substantial interaction among participants, although not all actors are equally connected. Degree centrality analysis revealed that approximately 14% of actors generated 60% of total interactions, indicating structural concentration around key actors. These central users function as hubs, significantly influencing information circulation and social engagement patterns.

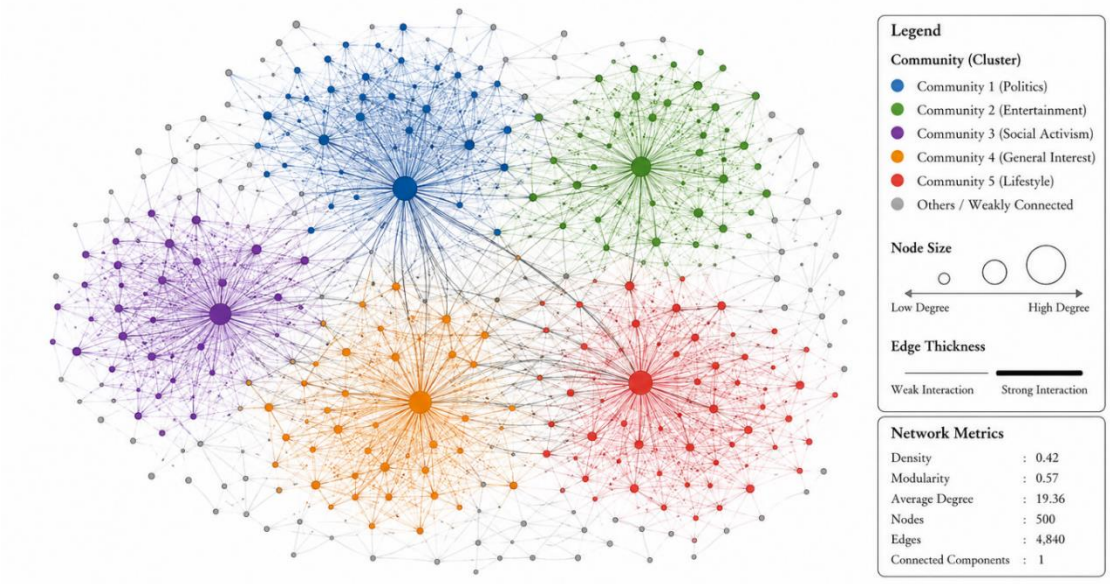

Figure 1. Digital Interaction Network Structure among 500 Accounts

Source: Social Network Analysis Processed Using Gephi, 2025

The network graph illustrates clusters of interaction centered around highly connected actors, suggesting that connectivity in digital society remains partially hierarchical despite apparent openness.

Distribution of Power and Access to Information

The second dimension examines how power and access to information are distributed in digital society.

Table 5. Access and Power in Digital Society

Statement	Mean
Digital media provides equal opportunities for everyone to express opinions	3.51
Social media algorithms create injustice in information distribution	3.92
Certain groups are more advantaged in digital society	3.82

Source: Primary Survey Data Processed by Authors, 2025

The results reveal a significant paradox. Respondents moderately agreed that digital media provides opportunities for expression (Mean = 3.51), indicating perceived openness. However, the highest score in this section concerns algorithmic inequality (Mean = 3.92), suggesting strong awareness that platform algorithms influence visibility and participation. This indicates that digital platforms are not neutral infrastructures. Rather, algorithmic governance shapes whose voices gain prominence and whose remain marginalized. Structural inequality persists despite increased accessibility.

Betweenness centrality analysis identified a limited number of actors occupying key intermediary positions. These actors controlled communication bridges between clusters, enabling them to influence information flow across communities. Such structural positions grant disproportionate power over digital discourse. Network modularity reached 0.57, indicating strong community clustering. Distinct clusters formed around political discussion, entertainment, and civic activism. While clustering enhances internal cohesion, it also increases the risk of echo chambers and ideological fragmentation. These findings confirm that digital society remains shaped by hidden hierarchies embedded within algorithmic systems and platform governance.

Digital Solidarity and Social Identity Formation

The final dimension examines solidarity and identity formation in digital communities.

Table 6. Social Solidarity in Digital Space

Statement	Mean
I feel part of a digital community	3.68
Digital media strengthens solidarity between individuals	3.69
My social identity is formed more in digital space	3.56

Source: Primary Survey Data Processed by Authors, 2025

The findings indicate relatively high levels of digital solidarity. Respondents generally agreed that digital spaces strengthen collective belonging and social cohesion. The highest score (3.69) indicates that digital media plays a meaningful role in reinforcing solidarity among users through shared interests, causes, and experiences.

High-density subgroups observed in the network graph further support this finding. Several clusters displayed frequent repeated interactions, suggesting strong community cohesion and trust among members.

However, digital identity formation scored slightly lower (Mean = 3.56), indicating that online identity remains complementary rather than dominant. Traditional social identities based on family, ethnicity, religion, and locality continue to influence how individuals engage online. This suggests the emergence of hybrid social identity, where users simultaneously navigate offline and online social roles. Rather than replacing traditional structures, digital interaction reshapes them into more fluid and networked configurations.

Correlation Analysis Between Variables

To examine relationships between key constructs, Pearson correlation analysis was performed.

Table 7. Correlation Analysis

Relationship	r	Sig.
Digital Interaction ↔ Digital Solidarity	0.682	0.000
Power Distribution ↔ Digital Solidarity	0.591	0.000
Digital Interaction ↔ Power Distribution	0.624	0.000

Source: SPSS Output Processed by Authors, 2025

The correlation analysis indicates significant positive relationships among all variables ($p < 0.001$). The strongest correlation exists between digital interaction and digital solidarity ($r = 0.682$), suggesting that increased digital engagement strongly contributes to stronger collective belonging. The positive correlation between power distribution and solidarity ($r = 0.591$) indicates that perceptions of power structures influence how individuals experience community and participation in digital spaces.

Digital Social Transformation Through Networked Structures: Theoretical and Practical Implications

The findings demonstrate that the transformation of social structure in the digital era extends beyond increased technology adoption to encompass a fundamental reconfiguration of how social relationships are established, maintained, and exercised. Rather than functioning merely as communication tools, digital platforms have become institutional environments that organize interaction, influence social participation, and redistribute power through networked connections. The integration of survey findings with Social Network Analysis (SNA) provides empirical evidence that contemporary social structures increasingly operate through interconnected digital networks characterized by both expanded connectivity and unequal relational influence. This confirms that digital society represents a structural transition from geographically bounded communities toward dynamic relational systems embedded within digital infrastructures.

One of the principal findings concerns the increasing intensity of digital interaction, indicating that online communication has become a dominant mechanism for maintaining social relationships. The high level of digital engagement observed among respondents suggests that interpersonal communication is progressively shifting from physical encounters toward continuous online interaction. This finding supports recent studies arguing that digital platforms have transformed communication from episodic exchanges into persistent networked interaction that transcends spatial and temporal boundaries (Cinque, 2024; Wong, 2025). Similarly, Aissani et al. (2024) emphasize that digital environments increasingly function as primary spaces for identity negotiation and everyday social participation. The present study extends these arguments by demonstrating that intensified digital interaction not only increases communication frequency but also restructures relational configurations through network expansion and continuous connectivity.

The Social Network Analysis further reinforces this interpretation by revealing a moderately dense interaction network accompanied by substantial concentration around highly connected actors. Although digital platforms provide broad opportunities for participation, the distribution of interaction remains uneven, with a relatively small proportion of actors occupying structurally dominant positions. This finding aligns with the work of Verwiebe and Hagemann (2024), who argue that digital participation is increasingly influenced by unequal distributions of digital capital rather than equal technological access alone. Likewise, Barta and Andalibi (2024) show that algorithmically mediated visibility privileges users who already possess extensive online influence. However, the present study contributes additional evidence by demonstrating how these inequalities become observable through measurable network structures, including degree centrality and network density. Consequently, the findings strengthen network sociology by illustrating that structural power in digital society emerges not only from institutional authority but also from relational positioning within communication networks.

Another important finding concerns the distribution of power and access to information. Respondents generally acknowledged that digital platforms facilitate public participation while simultaneously recognizing that algorithmic mechanisms create unequal visibility and influence. This apparent contradiction reflects one of the defining characteristics of contemporary digital society. Platform algorithms simultaneously democratize content production and centralize attention through recommendation systems that privilege specific actors, topics, or communities. These findings correspond with recent research highlighting algorithmic governance as a new form of institutional power that regulates information circulation without direct political intervention (Haggart & Tusikov, 2023; Yang & Zhang, 2023). Unlike traditional hierarchical governance, algorithmic governance operates indirectly through computational selection, personalization, and recommendation processes. The present study contributes to this discussion by demonstrating that users themselves increasingly perceive these invisible mechanisms as important determinants of participation and influence.

The modularity analysis further revealed the emergence of distinct community clusters organized around shared interests and communication patterns. These clustered structures indicate that digital society encourages the formation of specialized communities capable of strengthening internal cohesion while simultaneously limiting cross-community interaction. This finding is consistent with Campos and da Silva (2024), who found that digital communities facilitate rapid collective mobilization through shared narratives and common identities. Similarly, Storozhenko et al. (2023) reported that online communities increasingly function as spaces where collective identities are constructed independently of geographical proximity. Nevertheless, the current study reveals that strong community clustering also increases the potential for informational fragmentation, as interactions become concentrated within relatively homogeneous groups. Consequently, digital communities simultaneously promote solidarity and reduce exposure to diverse perspectives, reinforcing the coexistence of integration and fragmentation within networked society.

The findings regarding digital solidarity provide additional theoretical insight into the evolving nature of social cohesion. Respondents generally perceived digital platforms as environments capable of strengthening collective belonging and maintaining interpersonal relationships. This observation supports previous studies suggesting that online communities increasingly fulfill emotional, informational, and collaborative functions traditionally associated with physical communities (Dias et al., 2022; Mei, 2024). Rather than weakening social bonds, digital interaction appears to create alternative forms of solidarity based upon shared interests, values,

and experiences. However, the present findings also indicate that digital identity complements rather than replaces offline identity. Traditional social affiliations rooted in family, locality, religion, and cultural background continue to shape online behavior, suggesting that digital identity remains embedded within broader social contexts.

This coexistence of online and offline identities represents one of the study's most significant theoretical contributions. Previous digital sociology research has often conceptualized online identity as replacing conventional social identity or creating entirely new forms of social organization. The current findings instead suggest a process of hybridization, where individuals simultaneously negotiate multiple identities across interconnected social environments. This interpretation resonates with recent discussions concerning hybrid sociality, which emphasize the integration rather than separation of digital and physical social experiences (Whelan, 2025; Cinque, 2024). By combining SNA with behavioral survey evidence, this study demonstrates that hybrid identity is observable not only through subjective perceptions but also through measurable interaction structures, thereby extending network sociology beyond purely structural analysis.

Another important contribution of this study concerns the integration of relational network metrics with sociological interpretation. Many previous studies examining digital society rely either on computational network analysis without sociological interpretation or on qualitative discussions lacking structural measurement. The present research bridges these approaches by combining survey-based perceptions with network indicators such as density, degree centrality, betweenness centrality, and modularity. This integrated analytical framework enables a more comprehensive understanding of how communication structures influence social interaction, solidarity, and power distribution. Consequently, the study contributes methodological innovation by demonstrating that quantitative network analysis can be meaningfully integrated with sociological theory to explain structural transformation in digital society.

The novelty of this research lies in its comprehensive examination of digital social transformation through both relational and behavioral dimensions. While existing studies have extensively investigated algorithmic governance, digital participation, and online communities independently, relatively few have simultaneously analyzed network structures, perceptions of power, and solidarity within a unified analytical framework. Furthermore, empirical evidence from Southeast Asia remains comparatively limited despite the region's rapid digitalization and expanding online participation. By focusing on Indonesian urban digital communities, this study contributes context-specific evidence that enriches international discussions concerning digital sociology, network governance, and social transformation in emerging digital societies.

From a practical perspective, these findings carry important implications for policymakers, platform developers, educational institutions, and civil society organizations. Policymakers should recognize that expanding internet access alone is insufficient to promote inclusive digital participation. Policies must also address algorithmic transparency, digital literacy, and equitable opportunities for information dissemination. Platform developers should consider designing recommendation systems that encourage greater diversity of interaction while reducing excessive concentration around highly connected actors. Educational institutions may use these findings to strengthen digital citizenship programs that emphasize critical media literacy, responsible online participation, and awareness of algorithmic influence. Civil society organizations can utilize network-based approaches to improve community engagement and strengthen collaborative digital initiatives capable of bridging fragmented online communities.

The study also has broader implications for network sociology. Traditional sociological perspectives frequently conceptualize social structure through institutional hierarchy, geographic proximity, or stable organizational membership. The present findings indicate that digital society increasingly organizes social relationships through flexible relational networks where influence is determined by connectivity rather than formal authority. Consequently, network sociology offers an increasingly relevant theoretical framework for understanding contemporary society because it accommodates both decentralized participation and emergent structural inequality. This research therefore reinforces the continuing relevance of network theory in explaining digital-era transformations while simultaneously extending its application through empirical integration with behavioral analysis.

Despite these contributions, several limitations should be acknowledged. First, the study focused primarily on respondents from major urban areas in Indonesia, which may limit the generalizability of findings to rural populations or societies with different technological infrastructures. Second, the cross-sectional design captures digital interaction at a single point in time and therefore cannot fully explain the longitudinal evolution of online networks or changing patterns of social participation. Third, although Social Network Analysis provides valuable structural insights, publicly accessible interaction data may not fully capture private communication occurring through encrypted messaging platforms. Finally, the survey relied on self-reported perceptions that may be influenced by individual interpretation or response bias despite satisfactory reliability and validity.

Future research should therefore adopt longitudinal research designs capable of examining how digital social structures evolve over time, particularly as artificial intelligence, platform governance, and immersive technologies continue to reshape communication. Comparative cross-national studies would further strengthen understanding of how cultural, political, and institutional contexts influence network formation and digital inequality. Future investigations may also integrate computational social science techniques, including machine learning, natural language processing, and dynamic network analysis, to examine large-scale interaction patterns across multiple digital platforms. Such approaches would extend understanding of how technological innovation continues to transform social structure within increasingly interconnected digital societies.

CONCLUSION

The structure of social relationships in digital society is changing significantly, as this study shows. Digital platforms are active spaces for the development of identity, solidarity, and influence rather than just being means for communication, according to social network research and survey results. Digital interactions do not completely replace offline identities or in-person encounters, even though they allow for greater connectivity and promote new kinds of social cohesion. Rather, a hybrid social reality is shaped by the coexistence, interaction, and occasionally competition of digital and physical social places.

The research further underscores the contradictory character of digital social institutions. Digital platforms, on the one hand, democratize participation by enabling people to interact, voice their ideas, and create communities across social and geographic divides. However, enduring hierarchies and inequalities are reflected in the establishment of clustered communities, the concentration of interactions around prominent actors, and the impact of platform algorithms. This emphasizes how both overt and covert forms of authority continue to shape digital society, despite its seeming openness and horizontality. Lastly, the results highlight how digital networks play a part in the active creation of social meaning in addition to connectivity. Although digital spaces make it easier to create new identities and

solidarity, they also necessitate a critical understanding of their structural constraints and potential for fragmentation. Therefore, comprehending how social structures are changing in the digital age necessitates an integrated viewpoint that takes into account both quantitative network patterns and user subjective experiences. Future studies should keep examining the interactions between offline and digital social structures and how these dynamics affect social cohesiveness, participation, and equity in societies that are becoming more interconnected.

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