Komunike Jurnal Komunikasi Penyiaran Islam
Vol. XIII No. 1 (2026) 83-110 | E-ISSN : 2597-9310
Submission : 18 – 03 – 2026 | DOI: 10.20414/jurkom.v18i1.15372 | Accepted : 18 – 06 – 2026

THE DOMINANCE OF ALGORITHMIC CURATION AND THE WEAKENING OF CRITICAL THINKING ON SOCIAL MEDIA

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Abstract

The development of social media has transformed the way society accesses and consumes information through algorithmic curation mechanisms. Several studies have shown that the dominance of algorithms influences critical thinking. This study employs a Systematic Literature Review (SLR) method by following the stages of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA). The findings indicate that algorithmic curation tends to strengthen content personalization, create filter bubbles and echo chambers, and limit users' exposure to diverse information. This condition has implications for the decline in users' ability to critically evaluate information. The dominance of algorithmic curation has a significant impact; therefore, strengthening digital literacy and promoting algorithmic transparency are necessary as mitigation efforts.

Keywords: *Algorithmic Curation, Critical Thinking, Social Media.*

Abstrak

Perkembangan media sosial telah mengubah cara masyarakat mengakses dan mengonsumsi informasi melalui mekanisme kurasi algoritmik. Sejumlah study menunjukkan dominasi algoritma mempengaruhi *critical thinking*. Penelitian ini menggunakan metode *Systematic Literature Review* (SLR) dengan mengikuti tahapan *Preferred Reporting Items for Systematic Reviews* and *Meta-Analysis* (PRISMA). Temuan menunjukkan kurasi algoritmik cenderung memperkuat personalisasi konten, membentuk *filter bubble* dan *echo chamber*, serta membatasi paparan pengguna terhadap informasi. Hal ini berimplikasi pada menurunnya kemampuan evaluasi kritis terhadap informasi. Dominasi kurasi algoritmik memiliki dampak signifikan, sehingga diperlukan penguatan literasi digital serta transparansi algoritma sebagai upaya mitigasi.

Kata Kunci: Kurasi Algoritmik, Berpikir Kritis, Media Sosial.

A. INTRODUCTION

The development of digital technology has transformed the way society accesses, produces, and distributes information in everyday life.[1] Social media has now become one of the main sources of information used by the public to obtain news, knowledge, and various public issues quickly and easily. [2] The presence of digital platforms enables users to access a vast amount of information without spatial and temporal limitations. Therefore, social media no longer functions merely as a medium of interpersonal communication, but also as a major space for the formation of public opinion and knowledge.

The increasing volume of information circulating on social media has encouraged digital platforms to develop algorithmic curation systems to manage highly complex information flows. Algorithmic curation refers to an automated process used to select, rank, and recommend content based on users' characteristics and behavior.[3] This system operates by utilizing various forms of interaction data, such as search history, content consumption duration, clicks, comments, and information-sharing activities. Thus, algorithms determine the information considered most relevant to be displayed to each user.[4]

In its early development, algorithmic curation was regarded as a solution to address the growing phenomenon of information overload in the digital environment. The continuously increasing amount of information each day makes it difficult for users to find content that suits their needs. Therefore, recommendation systems were developed to help users obtain information that is more relevant, efficient, and aligned with their interests.

Despite offering various conveniences, the dominance of algorithms in information distribution has also raised significant concerns in academic studies, as content personalization has the potential to influence the diversity of information received by users. Research by Helberger, Karppinen, and D'Acunto shows that recommendation systems oriented toward user preferences may

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[1] Muhamad Danuri, "Perkembangan dan Transformasi Teknologi Digital," *Infokam* 15, no. 2 (2019): 116-123, DOI: https://doi.org/10.53845/infokam.v15i2.178.

[2] Ayu Azizah Raodhatur Rahma, Hilma Ardianti, and Khalid Firman "Peran Media Sosial Dalam Dinamika Sosial Masyarakat Kontemporer," *Jurnal Komunikasi Digital dan Penyiaran Islam* 1, no. 2 (2024): 24-30.

[3] Rudi Rahman, et al., "Pengaruh Algoritma Media Sosial Terhadap Pola Komsumsi Informasi Di Kalangan Gen Z Di Universitas Hang Tuah Pekanbaru," *Pustaka Karya: Jurnal Ilmiah Ilmu Perpustakaan dan Informasi* 13, no 2 (2025): 351-358, DOI: https://doi.org/10.18592/pk.v13i2.18807.

[4] Amelia Tri Andini dan Yahfizham, "Analisis Algoritma Pemrograman Dalam Media Sosial Terhadap Pola Konsumsi Konten," *Jurnal Arjuna* 2, no. 1 (2024): 286-296, DOI: https://doi.org/10.61132/arjuna.v2i1.526.

reduce the diversity of information exposure,[5] while Bodó et al. found that news personalization has the potential to reinforce algorithmic feedback loops, causing users to be increasingly exposed to similar information.[6] This raises questions regarding the impact of algorithms on the quality of the digital public sphere and the diversity of information available to society.

Information diversity is one of the important principles in a democratic society because it enables individuals to obtain various perspectives in understanding an issue.[7] Exposure to diverse sources and viewpoints can broaden individuals' knowledge and support a more rational decision-making process. Conversely, limited access to diverse information may narrow individuals' understanding of complex social realities. Therefore, information diversity serves as an important indicator in assessing the quality of the digital communication ecosystem.

The debate on the impact of algorithmic curation has continued to develop alongside the emergence of the concepts of filter bubbles and echo chambers in digital media studies. A filter bubble refers to a condition in which users are more frequently exposed to information that aligns with their preferences as a result of algorithmic personalization.[8] Meanwhile, an echo chamber describes a situation in which individuals predominantly interact with groups that share similar views, thereby repeatedly reinforcing their beliefs.[9] Therefore, these phenomena are considered to have the potential to reduce information diversity within the digital public sphere.

In addition to influencing information diversity, academic attention has also focused on the impact of algorithmic curation on social media users' critical thinking skills. Critical thinking refers to an individual's ability to evaluate information rationally, identify bias, compare various arguments, and draw conclusions based on available evidence.[10] This ability has become increasingly important in a digital environment characterized by a high flow of information

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[5] Natali Helberger, Kari Karppinen, and Lucia D'Acunto, "Exposure Diversity as a Design Principle for Recommender Systems," *Information, Communication & Society* 21, no. 2 (2018): 191-207, DOI: https://doi.org/10.1080/1369118X.2016.1271900.

[6] Balázs Bodó, et al., "Interested in Diversity: The Role of User Attitudes, Algorithmic Feedback Loops, and Policy in News Personalization," *Digital Journalism* 7, no. 2 (2019): 206–229 DOI: https://doi.org/10.1080/21670811.2018.1521292.

[7] Philip Napoli, "*Foundations of communications policy : principles and process in the regulation of electronic media,*"(Cresskill, N.J., : Hampton Press, c2001) : 285-321.

[8] Eli Pariser, *The Filter Bubble: What the Internet Is Hiding from You* (UK: Penguin Books, 2011), 304.

[9] Cass R. Sunstein, #*Republic: Divided Democracy in the Age of Social Media* (Princeton: PrincetonUniversity Press, 2017), 328.

[10] Adica Syazaid, et al., " Dampak Filter Bubble terhadap Kemampuan Berpikir Kritis pada Pengguna Media Sosial," *Journal of Physicology Today* 3, no. 4 (2025): 237-243.

and the growing risk of misinformation. Therefore, the relationship between algorithms and critical thinking has become one of the key issues in contemporary digital media studies.

Various studies show that the quality of critical thinking is strongly influenced by the diversity of information received by individuals. Exposure to various perspectives enables users to reflect on, evaluate, and compare available information, as emphasized by Pangrazio and Selwyn,[11] while Wineburg and McGrew argue that the ability to critically evaluate information develops through engagement with diverse sources.[12] In addition, Roozenbeek and van der Linden found that exposure to diverse viewpoints can strengthen individuals' resilience to misinformation, whereas a homogeneous information environment has the potential to reinforce confirmation bias because users are more frequently exposed to information that supports their existing beliefs.[13] Therefore, information diversity and critical thinking ability are closely related within the social media ecosystem.

Although research on algorithmic curation continues to develop, existing studies still present varied findings. Several studies conclude that algorithms contribute to the reduction of information diversity by reinforcing exposure to content that aligns with users' preferences,[14] while other studies indicate that users still have opportunities to access diverse information through broad social networks and independent search activities.[15] These differing findings indicate that the impact of algorithmic curation on information diversity remains debated in the academic literature and requires a more comprehensive examination to understand its influence across various contexts of social media use.

Differences in research findings are also evident in studies on filter bubbles and echo chambers. Some studies have found that algorithmic personalization contributes to the formation of homogeneous information environments and increases opinion polarization. However, other studies

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[11] Luci Pangrazio and Neil Selwyn, "Personal Data Literacies': A Critical Literacies Approach to Enhancing Understandings of Personal Digital Data," *New Media & Society* 21, no. 2 (2018): 1-19, DOI: https://doi.org/10.1177/1461444818799523.

[12] Sam Wineburg and Sarah McGrew, "Lateral Reading: Reading Less and Learning More When Evaluating Digital Information," *Teachers College Record: The Voice of Scholarship in Education*, 121, no 11(2019): 1-40, DOI: https://doi.org/10.1177/016146811912101102

[13] Jon Roozenbeek and Sander van der Linden, "The Fake News Game: Actively Inoculating Against the Risk of Misinformation," *Journal of Risk Research* 22, no. 5 (2019): 570-580, DOI: https://doi.org/10.1080/13669877.2018.1443491

[14] Seth Flaxman, Sharad Goel, and Justin M. Rao, "Filter Bubbles, Echo Chambers, And Online News Consumption," *Public Opinion Quarterly* 80, (2016): 298–320.DOI: https://doi.org/10.1093/poq/nfw006

[15] Frederik Zuiderveen Borgesius, et al., "Should We Worry About Filter Bubbles?," *Internet Policy Review* 5, no. 1 (2016): 1-16, DOI: https://doi.org/10.14763/2016.1.401.

indicate that the degree of information homogenization is not always high, as users can still access various sources of information beyond algorithmic recommendations.[16] Therefore, the influence of algorithms on the structure of digital information still requires more comprehensive investigation.

In terms of critical thinking, previous studies have also produced findings that are not entirely consistent. Several studies have found that exposure to homogeneous information can reinforce confirmation bias and reduce users' tendency to evaluate information critically. Conversely, other studies suggest that social media can also expand access to knowledge and encourage learning when users possess an adequate level of digital literacy.[17] Thus, the relationship between algorithmic curation and critical thinking ability still requires a more systematic explanation.

In addition to differences in empirical findings, most previous studies tend to discuss information diversity and critical thinking separately. Studies on information diversity generally focus on information distribution, media pluralism, and digital democracy, whereas research on critical thinking is more often situated within the contexts of education, media literacy, and digital literacy.[18] Therefore, there remains a limited understanding of the relationship between the dominance of algorithmic curation, information diversity, and critical thinking within an integrated analytical framework.

This research gap indicates the need for a study that is able to integrate various findings regarding the impact of algorithmic curation on information diversity and social media users' critical thinking. An integrated approach is necessary because these two aspects are interrelated in shaping the quality of users' information experiences. Information diversity influences the process of information evaluation, while critical thinking skills determine how users interpret and respond to the information they receive. Therefore, a study that connects these two aspects can provide a more comprehensive understanding of the social implications of algorithmic dominance.

Unlike previous studies, which generally focus on a single specific aspect, this study integrates the issues of information diversity and critical thinking into one systematic investigation. This study not only identifies the impact of

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[16] Anis Defri Agustina, et al., " Rekonstruksi Politik Untuk Menganalisis Polarisasi Dan Gangguan Demokrasi Di Media Sosial Indonesia," *Jurnal Ilmiah Ilmu Sosial dan Pendidikan* 4, no. 2 (2026): 1-10.

[17] Elizabeth Dubois and Grant Blank, "The echo chamber is overstated: the moderating effect of political interest and diverse media," *Information, Communication & Society* 21, no. 5 (2018): 729–745. DOI: https://doi.org/10.1080/1369118X.2018.1428656

[18] Nurfatmawati, "Urgensi Literasi Digital dalam Meningkatkan Keterampilan Abad 21 di Sekolah Dasar: Kajian Literatur dan Strategi Implementasi," *Social, Humanities, and Educational Studies*, 8 no 3 (2025): 1483-1490 DOI: https://doi.org/10.20961/shes.v8i3.107405

algorithms on information distribution but also examines their implications for users' cognitive ability to evaluate information. Thus, this study offers a more holistic perspective on the consequences of algorithmic curation in social media. This approach represents one form of novelty offered by the present study.

The novelty of this study also lies in the use of the Systematic Literature Review (SLR) method to synthesize research findings published over the last decade. This approach enables the identification of patterns, trends, and developments in research on algorithmic curation in a more systematic manner than conventional narrative reviews. Through a structured synthesis process, this study can generate a stronger understanding of the relationship between algorithms, information diversity, and critical thinking. Thus, this study contributes to strengthening the knowledge base in digital media studies.

Research on the dominance of algorithmic curation has become increasingly urgent in line with society's growing dependence on social media as a primary source of information. Algorithmic decisions in determining the visibility of information can influence how society understands social, political, economic, and cultural issues. This impact becomes increasingly significant because most information-seeking activities today take place through digital platforms. Therefore, understanding the consequences of algorithmic curation is important for explaining the dynamics of communication in contemporary digital society.

The urgency of this study is also related to the growing attention to the quality of digital literacy and society's critical thinking skills. In an increasingly personalized information environment, users need the ability to critically evaluate information and understand the mechanisms that influence information distribution. Without this ability, users are at greater risk of becoming vulnerable to information bias, misinformation, and opinion polarization. Therefore, the findings of this study are expected to provide theoretical contributions to the development of digital media studies, as well as practical contributions to strengthening digital literacy, algorithmic transparency, and more democratic platform governance.

B. RESEARCH METHOD

This study employs a qualitative methode using the Systematic Literature Review (SLR) method to identify, evaluate, and synthesize various scientific findings regarding the influence of algorithmic curation on information diversity

and critical thinking on social media.[19] The SLR method was selected because it can provide a comprehensive understanding of research developments in a particular field in a systematic and structured manner. This study focuses on literature discussing algorithmic curation, information diversity, filter bubbles, echo chambers, digital literacy, and critical thinking in the context of social media. Thus, this study is able to integrate various findings from previous research to obtain a more complete understanding of the phenomenon under investigation.

The research data were derived from scholarly articles indexed in Google Scholar, Scopus, Web of Science, Dimensions, and Crossref. The literature used in this study consisted of journal articles, conference proceedings, and academic studies published between 2016 and 2026 to ensure the currency and relevance of the data. The search process was conducted using keywords such as algorithmic curation, social media algorithm, information diversity, critical thinking, filter bubble, echo chamber, and digital literacy, assisted by Boolean operators such as "and" and "or". This strategy was used to obtain literature that was directly related to the objectives of the study.

Inclusion Criteria	**Exclusion Criteria**
Articles published between 2016 and 2026	Articles published before 2016
Peer-reviewed articles	Non-scholarly articles or opinion pieces
Articles discussing social media and algorithms	Articles that do not discuss social media
Articles written in Indonesian or English	Articles written in languages other than Indonesian or English
Articles relevant to the research focus	Articles not relevant to the research topic
Full-text articles that are accessible	Full-text articles that are not available

Table 1. Inclusion and Exclusion Criteria

The literature selection was conducted based on inclusion and exclusion criteria established prior to the analysis process. The inclusion criteria included peer-reviewed articles published between 2016 and 2026, written in Indonesian or English, discussing social media and algorithms, and having accessible full

[19] Barbara Kitchenham and Stuart Charters, "Guidelines for Performing Systematic Literature Reviews in Software Engineering," *Keele University Technical Report EBSE-2007-01* (2007): 1-65.

texts. Conversely, articles that were not relevant to the research focus, were published before 2016, or were not available in full-text form were excluded from the analysis process. The entire process of article identification, screening, evaluation, and selection followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines.

PRISMA Stages	Description
Identification	Article searches were conducted through Google Scholar, Scopus, Web of Science, Dimensions, and Crossref.
Screening	Duplicate articles were removed, and articles were screened based on their titles and abstracts.
Eligibility	Articles were thoroughly evaluated based on the research criteria.
Inclusion	Articles to be used in the final analysis were selected.

Table 2. Literature Selection Stages Based on PRISMA

Data analysis was conducted through a combination of Thematic Analysis, Content Analysis, and Narrative Synthesis. Thematic Analysis was used to identify the main themes emerging from the literature, while Content Analysis was used to categorize findings based on the focus of the study, methods, and research results. Furthermore, Narrative Synthesis was used to integrate various findings in order to produce a comprehensive understanding of the relationship between algorithmic curation, information diversity, and critical thinking skills.[20] Thus, to enhance the reliability of the study, each article was analyzed systematically by comparing the similarities and differences in findings across various studies.

C. RESULTS AND DISCUSSION

The Working Patterns of Algorithmic Curation

The results of the literature synthesis show that algorithmic curation is an automated mechanism used by social media platforms to determine, rank, and recommend content to users. This system utilizes various forms of user behavioral data, such as search history, clicks, comments, likes, content consumption duration, and other interaction activities. These data are then processed using artificial intelligence technologies to predict the content

[20] Jennie Popay, et al, "Guidance on the Conduct of Narrative Synthesis in Systematic Reviews: A Product from the ESRC Methods Programme," *Lancaster University Report* 1, no. 1 (2006): 1-92 DOI: https://10.13140/2.1.1018.4643.

considered most relevant to each individual. Thus, algorithms have become a central component in the process of information distribution across almost all social media platforms.

The analyzed literature indicates that each platform has different algorithmic characteristics in managing information. Facebook and Instagram place greater emphasis on social interactions, such as comments, reactions, and relationships among users, in determining content priority. Meanwhile, YouTube and Tik-Tok rely more heavily on content consumption behavior data, such as watch duration, video completion rate, and the frequency of user interaction with particular content categories. This results in diverse patterns of information distribution, although the platforms share the same objective, namely to increase content relevance and user engagement.

Most studies show that algorithmic recommendation systems operate through a continuous personalization process. Algorithms continuously update recommendations based on changes in user behavior recorded by the system. The more frequently users interact with certain types of content, the more likely algorithms are to recommend similar content in subsequent interactions. Therefore, this process contributes to the creation of an information environment that is increasingly tailored to each user's preferences.

Other findings indicate that algorithms do not only consider user preferences but also take into account the performance of specific content. Indicators such as the number of comments, shares, reactions, audience retention rate, and content popularity become important factors in determining information visibility. Content that receives high engagement tends to have a greater opportunity to be widely distributed by the system. Therefore, algorithms function as a primary mechanism that determines the level of information exposure on social media.

The synthesis results also show that the development of Artificial Intelligence, Machine Learning, and Deep Learning technologies has increased the complexity of algorithmic curation systems. In addition to recommending relevant content, algorithms also filter out information that is predicted to generate low levels of interaction. This development has shifted information distribution from a chronological model to a predictive model based on data and user behavior. Thus, algorithms have become a core infrastructure that regulates information flows and user experiences within the contemporary social media ecosystem.

Aspect	Main Findings
Algorithmic Data Sources	Search history, clicks, comments, likes, shares, and content consumption duration
Main Objective	To increase content relevance and user engagement
Working Mechanism	Personalization based on user behavior and preferences
Determinants of Visibility	Engagement, audience retention, popularity, and social interaction
Supporting Technologies	Artificial Intelligence, Machine Learning, and Deep Learning
Main Impact	Information distribution becomes increasingly personalized

Table 3. Synthesis of the Working Patterns of Algorithmic Curation

The Influence of Algorithmic Curation on Information Diversity

The results of the literature synthesis show that information diversity is one of the most frequently discussed issues in research on algorithmic curation in social media. Most studies have found that algorithms play an important role in determining the types, sources, and perspectives of information received by users. Through personalization mechanisms, recommendation systems filter and prioritize content based on users' interaction histories. Therefore, each user's information consumption experience becomes increasingly different and depends on the algorithmic decisions implemented by the platform.

The literature findings indicate that algorithmic personalization tends to increase users' exposure to content that aligns with their previous preferences and behaviors. Users who frequently interact with certain topics are more likely to receive content recommendations with similar characteristics. This results in a more limited variety of information appearing on users' feeds compared to the overall information available on the platform.

Several studies have found that algorithmic curation can reduce users' opportunities to be exposed to perspectives that differ from their existing beliefs or interests. Research by Spohr shows that social media algorithms tend to reinforce exposure to information that aligns with users' preferences, thereby limiting the diversity of viewpoints they receive.[21] This finding is supported by Cinelli et al., who found that personalization mechanisms contribute to the

[21] Dominic Spohr, "Fake news and ideological polarization: Filter bubbles and selective exposure on social media." *Business information review* 34, no. 3 (2017): 150-160.

formation of echo chambers, which encourage users to interact more frequently with information that confirms their existing views. [22] The spectrum of information received by users becomes narrower in a highly personalized social media environment.

In addition to influencing the diversity of perspectives, the findings also show that algorithms affect the diversity of information sources. In algorithm-based information distribution systems, the visibility of a source is strongly influenced by the level of relevance and engagement predicted by the system. This condition causes some information sources to gain greater exposure than others. Information distribution becomes more selective, and not all sources have equal opportunities to reach users.

Although most studies indicate a tendency toward declining information diversity, several studies have found that algorithms can also introduce users to new information through exploration features and cross-network recommendations. These findings suggest that the impact of algorithms on information diversity is not always uniform, as it is influenced by algorithm design, platform characteristics, and user behavior. The level of information diversity received by users may differ across social media platforms. Therefore, algorithmic curation has a significant influence on information diversity, particularly in terms of content diversity, information sources, and the range of perspectives emerging within the digital environment.

Dimension of Analysis	**Main Findings**
Content diversity	Tends to decline due to repeated personalization
Source diversity	Some sources gain higher visibility than others
Perspective diversity	Exposure to alternative viewpoints is relatively reduced
Information personalization	Increases significantly across almost all platforms
Exposure to new information	Remains possible through certain algorithmic exploration features
Influencing factors	Algorithm design, platform characteristics, and user behavior
General impact	Information distribution becomes more selective and personalized

Table 4. Algorithmic Curation on Information Diversity

[22] Matteo Cinelli, et al., "The Echo Chamber Effect on Social Media," *Proceedings of the National Academy of Sciences (PNAS)* 118, no. 9 (2021):1-8 DOI: https://doi.org/10.1073/pnas.2023301118.

The Formation of Filter Bubbles and Echo Chambers

The results of the literature synthesis show that filter bubbles and echo chambers are two of the most frequently used concepts to explain the social consequences of algorithmic curation on social media. These two concepts describe conditions in which users are more frequently exposed to information that aligns with their existing preferences, beliefs, or viewpoints. Various studies indicate that this phenomenon emerges through the interaction between algorithmic personalization mechanisms and users' behavior in consuming information. Therefore, filter bubbles and echo chambers have become important focuses in studies on the impact of algorithms on the digital information environment.

Research findings show that filter bubbles are formed when algorithms continuously select and recommend content based on users' activity histories. Recommendation systems utilize behavioral data to predict the types of information most likely to generate positive responses from users. As a result, users are more frequently exposed to information considered relevant by the system than to information offering different perspectives. This condition causes the information space received by users to become increasingly limited and personalized.

Unlike filter bubbles, which are more closely related to algorithmic mechanisms, echo chambers are more strongly associated with the structure of social networks in digital media. The literature shows that users tend to build connections with individuals or groups that share similar views. Repeated interactions within these groups reinforce existing beliefs through the repetition of information and social validation. Therefore, dominant views within a group become stronger and are relatively rarely challenged by alternative perspectives.

The findings indicate that filter bubbles and echo chambers often emerge simultaneously within social media environments. Algorithms reinforce users' tendency to consume certain types of information, while social networks strengthen the distribution of information that aligns with group perspectives. The combination of these two mechanisms produces a relatively homogeneous information environment and is found across various social media platforms with different levels of intensity. This shows that information homogenization is influenced not only by technology but also by users' patterns of social interaction.

Most of the analyzed studies found that filter bubbles and echo chambers frequently appear in the contexts of politics, health, education, religion, culture, and lifestyle. Users with a high intensity of interaction with certain issues tend to experience greater levels of personalization and receive increasingly uniform information. Nevertheless, several studies indicate that diverse social networks,

active information-seeking behavior, and certain platform designs may still enable users to access more varied perspectives. In general, the synthesis results indicate a tendency toward information homogenization, which has the potential to limit exposure to alternative viewpoints within social media environments.

Aspect of Analysis	Main Findings
Filter bubble	Formed through algorithmic personalization based on users' behavioral history
Echo chamber	Formed through repeated interactions within groups that share similar views
Triggering factors	Algorithms, user preferences, and social network structures
Impact on information	Reduces exposure to alternative perspectives
Dominant contexts	Politics, health, education, religion, and culture
Intensity of the phenomenon	Varies across platforms and user groups
Moderating factors	Active information seeking, social network diversity, and platform design
General tendency	Increases the homogenization of the digital information environment

Table 5. Synthesis of Filter Bubbles and Echo Chambers

Users' Critical Thinking Ability

The results of the literature synthesis show that critical thinking ability is one of the aspects influenced by changes in information consumption patterns within algorithmically driven social media environments. Critical thinking in the digital context refers to an individual's ability to evaluate the credibility of information, compare various perspectives, identify bias, and formulate judgments based on available evidence. Various studies indicate that the quality of critical thinking is closely related to the level of information diversity received by users. Changes in information distribution resulting from algorithmic curation have become an important concern in studies of digital literacy and digital communication.

The literature findings indicate that high levels of content personalization can influence the way users process the information they receive. Users tend to interact more frequently with information that aligns with their existing interests and beliefs. This condition reduces users' opportunities to encounter views that differ from or contradict their own perspectives. The process of critically

evaluating various viewpoints becomes more limited compared to a more diverse information environment.

Several studies have found that exposure to homogeneous information can reinforce confirmation bias among social media users. Confirmation bias occurs when individuals are more likely to accept information that supports their beliefs than information that contradicts their existing views. In a highly personalized environment, users receive more information that reinforces their existing beliefs, thereby reducing their tendency to verify information. This indicates a relationship between algorithmic personalization, information homogenization, and the quality of users' information evaluation processes.

The findings also show that the dominance of algorithms in the information selection process can increase users' dependence on system recommendations. Users often accept information presented by platforms without further exploring other information sources. This condition has the potential to reduce users' initiative to independently search for, compare, and evaluate information. Several studies have found that algorithms can also have positive effects when they are designed to expand information exploration and introduce users to new sources or perspectives.

The analyzed literature shows that the level of digital literacy is an important factor influencing the relationship between algorithmic curation and critical thinking ability. Users with high digital literacy tend to be better able to understand how algorithms work and are more active in verifying the information they receive. Conversely, users with low digital literacy are more vulnerable to passively accepting information without examining its accuracy and credibility. In general, the synthesis results indicate that excessive information personalization has the potential to limit critical thinking processes, although its impact may vary depending on user characteristics and the design of the algorithms used.

Analysis Dimension	**Main Findings**
Information evaluation	Tends to decline when users receive homogeneous information
Confirmation bias	Increases as a result of exposure to information that aligns with users' beliefs
Information exploration	Decreases when users become overly dependent on algorithmic recommendations
Critical reflection	Is influenced by the level of information diversity received
Digital literacy	Serves as a moderating factor that determines the quality of critical thinking

Potential positive impact	Emerges when algorithms support the exploration of diverse information
Dominant research groups	Younger generations and active social media users
General tendency	Excessive personalization has the potential to limit critical thinking processes

Table 6. Influence of Algorithmic Curation on Critical Thinking

The Dominance of Algorithmic in the Digital Information Ecosystem

Algorithms have become a central component in the process of information distribution on social media. This finding indicates that users' experiences in accessing information are no longer determined entirely by individual choices, but also by computational systems developed by digital platforms.[23] From the perspective of mediatization theory, this change reflects how technological logic increasingly influences communication practices and the formation of social reality.[24] Digital media do not merely serve as channels for delivering information, but also function as actors that regulate how information is produced, disseminated, and consumed by society.

The dominance of algorithms in social media demonstrates a shift from a chronological model of information distribution to a predictive model. In the chronological model, users have relatively equal opportunities to access all available information based on the time of publication. In contrast, the predictive model prioritizes content that is expected to generate high levels of user engagement.[25] Algorithmic logic has replaced part of the editorial function previously performed by conventional media institutions.

The concept of Platform Society, proposed by Van Dijck, Poell, and De Waal, explains that digital platforms have developed into social infrastructures that regulate various activities in society.[26] In the context of this study, algorithms function as the main mechanism that connects users with the information

[23] Tarleton Gillespie, "*The Relevance of Algorithms,*" *Media Technologies: Essays on Communication, Materiality, and Society*, ed. Tarleton Gillespie, Pablo J. Boczkowski, dan Kirsten A. Foot (Cambridge: MIT Press, 2014), 1-32 DOI: https://doi.org/10.7551/mitpress/9780262525374.003.0009.

[24] Stig Hjarvard, "The Mediatization of Society: A Theory of the Media as Agents of Social and Cultural Change," *Nordicom Review* 29, no. 2 (2008): 105-134, DOI: https://doi.org/10.1515/nor-2017-0181.

[25] Marcelo Feitosa and Maricela Mosconi, "The Influence of Social Media Algorithms on Brand Visibility and Customer Engagement for New Ventures," Journal of Technologi, *In EnterepE* 1, no. 2 (2022): 8.

[26] José van Dijck, Thomas Poell, and Martijn de Waal, *The Platform Society: Public Values in a Connective World* (Oxford: Oxford University Press, 2018), 23.

available on platforms. This process occurs automatically through the use of large amounts of user behavioral data. Therefore, the relationship between users and information is increasingly mediated by algorithmic systems operating behind digital platforms.

Algorithmic decision-making is highly dependent on the data generated by users' activities. Every digital interaction, such as clicks, comments, content sharing, and the duration of information consumption, becomes a data source used to construct user profiles.[27] Algorithms not only respond to user behavior but also shape future patterns of information consumption.

From the perspective of algorithmic power, the power of algorithms is not always directly visible to users. Most information selection processes occur through complex and non-transparent mechanisms.[28] Users generally only see the final output in the form of content recommendations appearing on their feeds, without knowing the decision-making processes that take place behind the system. This enables algorithms to influence information exposure without being recognized by most users.

The findings of this study are consistent with various studies that position algorithms as a new form of power in the digital environment. This power does not operate through direct control over individual behavior, but rather through the regulation of access to available information. When algorithms determine which information is easier to find or more frequently displayed, they indirectly influence the process of knowledge formation and public opinion. In other words, information distribution on social media is no longer neutral because it is shaped by the operational logic of platforms.

The main objective of algorithms is to increase users' engagement with platforms. Recommendation systems are designed to maintain users' attention for as long as possible by presenting content considered relevant and interesting.[29] This strategy provides economic benefits for platforms because it is related to increased user traffic and advertising revenue. Therefore, algorithmic logic cannot be separated from the economic interests that underlie the operations of digital platforms.

On the other hand, the dominance of algorithmic logic raises various challenges related to transparency and accountability. Many studies highlight

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[27] Shoshana Zuboff, *The Age of Surveillance Capitalism: The Fight for a Human Future at the New Frontier of Power* (New York: PublicAffairs, 2019), 75.

[28] Bambang Mudjiyanto et al., "Antara Narasi Digital, Algoritma Politik, dan Plot Twist Politik: Media Sosial dan Demokrasi Digital Indonesia," *Jurnal Politik Pemerintahan IPTEK* 11, no. 2 (2025): 1-14.

[29] Rudi Rahman, et al, "*Pengaruh Algoritma Media Sosial Terhadap Pola Konsumsi Informasi,*" Jurnal Pustaka Karya 13, no. 2 (2025): 1-11.

that users have very limited access to understanding how the systems that determine their information experiences operate. This lack of transparency makes it difficult to evaluate potential biases that may arise in algorithmic decision-making. As a result, discussions on digital platform governance increasingly emphasize the importance of openness and oversight of algorithmic systems.

Algorithms have evolved from merely technical instruments into social infrastructures that influence digital communication processes. This role positions algorithms as one of the main actors in shaping the contemporary information environment. The influence of algorithms is evident not only in the distribution of information but also in the formation of interaction patterns, preferences, and behaviors among social media users. Thus, the dominance of algorithmic logic is a fundamental characteristic of today's digital information ecosystem.

Based on the findings and theoretical discussion presented above, it can be understood that algorithms occupy a strategic position in determining how information is produced, distributed, and consumed on social media. This power emerges through the ability of algorithms to manage information visibility based on the logic of personalization and user engagement. This condition indicates that algorithms no longer function merely as technological tools, but as mechanisms that shape the structure of modern digital communication. Therefore, understanding the dominance of algorithmic logic is important for explaining the various changes occurring within the contemporary digital information ecosystem.

Algorithmic Curation and Information Diversity

One of the most prominent impacts of the dominance of algorithmic curation is the change in the level of information diversity received by social media users. This finding is reflected in the tendency of algorithms to recommend content based on users' previous interaction patterns and preferences. Although this mechanism increases information relevance, excessive personalization has the potential to limit access to diverse perspectives.[30] This condition indicates that information diversity on social media is no longer determined solely by the availability of information, but also by the selection processes carried out by algorithms.

[30] Virani Wulandari, Gema Rullyana, and Ardiansah Ardiansah, "Pengaruh Algoritma Filter Bubble dan Echo Chamber Terhadap Perilaku Penggunaan Internet," *Berkala Ilmu Perpustakaan dan Informasi* 17, no. 1 (2021): 86-111, DOI: https://doi.org/10.22146/bip.v17i1.423.

From the perspective of Information Diversity, information diversity is an important element in creating a healthy and democratic communication space.[31] Diversity is not only related to the amount of information available, but also includes variations in sources, perspectives, opinions, and interpretations of an issue. Exposure to diverse information enables individuals to gain a broader understanding and develop the ability to assess an issue from various points of view. Therefore, a decline in information diversity can affect the quality of knowledge formation in digital society.

Algorithms tend to prioritize information that has a high likelihood of generating positive responses from users. Recommendation systems operate based on the principle of engagement prediction, thereby more frequently displaying content that aligns with users' interests and preferences.[32] As a result, users receive greater exposure to information that is already familiar to them or that they previously liked. This situation can gradually reduce opportunities to encounter information that differs from or contradicts their existing views.

This phenomenon can be explained through Selective Exposure Theory, which states that individuals tend to choose information that aligns with their existing beliefs and attitudes. In the social media environment, this tendency is reinforced by algorithms that automatically present content based on users' previous behavior. The interaction between user preferences and recommendation systems creates increasingly selective patterns of information consumption. Thus, algorithms do not merely follow user preferences, but also reinforce existing tendencies toward selective information exposure.

The findings of this study are consistent with various studies showing that algorithmic personalization contributes to the narrowing of the information spectrum received by users. When algorithms continuously optimize relevance based on historical data, the variety of information appearing on users' feeds becomes increasingly limited. Users are more frequently exposed to information that shares similar themes, perspectives, or orientations. As a result, opportunities to interact with alternative ideas become increasingly reduced.

The decline in information diversity is also related to changes in the structure of the digital public sphere. In the concept of the public sphere, the exchange of diverse ideas is an important condition for the formation of rational and inclusive discussion. However, the dominance of algorithms has the potential to create a fragmented communication environment because each user

[31] Jamilah, et al., "Keberagaman Informasi di Media Sosial dan Dampaknya Terhadap Politisasi Opini Publik Kontemporer," *Jurnal Sosial Teknologi* 3, no. 5 (2023): 1-23.

[32] Amelia Tri Andini and Yahfizham, "Analisis Algoritma Pemrograman Dalam Media Sosial Terhadap Pola Konsumsi Konten," *Jurnal Arjuna* 2, no. 1 (2024): 286-296, DOI: https://doi.org/10.61132/arjuna.v2i1.526.

receives a different combination of information. This condition makes information experiences increasingly individualized and reduces the existence of shared spaces that can be accessed equally by all users.

The fragmentation of the digital public sphere becomes evident when different user groups receive significantly different information exposure. Users with certain interests, political preferences, or social orientations are more likely to receive information that reinforces the characteristics of their group. Meanwhile, information circulating outside these groups tends to have lower visibility. As a result, the process of exchanging ideas across groups becomes increasingly limited within the social media environment.

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Algorithmic Curation, Filter Bubbles, and Echo Chambers

Filter bubbles and echo chambers are two phenomena most frequently associated with the dominance of algorithmic curation on social media. These two concepts explain how users can become trapped in relatively homogeneous information environments as a result of the combination of algorithmic personalization and patterns of social media interaction.[33] The research findings show that algorithms tend to recommend information that aligns with users' preferences, while users also tend to interact with individuals who share similar views. The interaction between these two factors creates conditions that enable the formation of information spaces that are increasingly closed to alternative perspectives.

The concept of the filter bubble, introduced by Eli Pariser, explains that algorithms indirectly filter the information received by users based on their behavioral data.[34] In this system, users no longer see the entirety of available information, but only a portion of information considered relevant by algorithms. The findings of this study support this argument by showing that content recommendations on social media are strongly influenced by users' interaction histories. As a result, the information appearing on users' feeds tends to share similar themes, orientations, and perspectives with information they have previously consumed.

Filter bubbles are not formed instantly, but through a continuous process of personalization. Every user action, such as liking, sharing content, commenting, or watching a video until completion, becomes data used to update subsequent recommendations.[35] The more consistent users' interaction patterns are with certain types of information, the stronger the system's tendency becomes to narrow the variety of information displayed. Thus, filter bubbles are the result of accumulated interactions between user behavior and algorithmic mechanisms that operate continuously.

In addition to filter bubbles, there is also a tendency for echo chambers to form within social media environments. Cass Sunstein defines an echo chamber

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[33] Virani Wulandari, Gema Rullyana, and Ardiansah Ardiansah, "Pengaruh Algoritma Filter Bubble dan Echo Chamber Terhadap Perilaku Penggunaan Internet," *Berkala Ilmu Perpustakaan dan Informasi* 17, no. 1 (2021): 86-111, DOI: https://doi.org/10.22146/bip.v17i1.423.

[34] Eli Pariser, *The Filter Bubble: What the Internet Is Hiding from You* (London: Penguin Books, 2011), 24.

[35] Virani Wulandari, Gema Rullyana, and Ardiansah Ardiansah, "Pengaruh Algoritma Filter Bubble dan Echo Chamber Terhadap Perilaku Penggunaan Internet," *Berkala Ilmu Perpustakaan dan Informasi* 17, no. 1 (2021): 86-111, DOI: https://doi.org/10.22146/bip.v17i1.423.

as a condition in which individuals more frequently interact with groups that share similar views, resulting in the repeated reinforcement of beliefs.[36] Social media facilitates the formation of digital communities that share similar interests, ideologies, or particular orientations. In such environments, the information circulating within the group tends to receive validation from group members without undergoing a critical evaluation of differing viewpoints.

The relationship between filter bubbles and echo chambers can be seen in the way both phenomena reinforce each other in the process of digital information distribution. Filter bubbles limit the variety of information received by users through algorithmic personalization mechanisms. Meanwhile, echo chambers reinforce users' existing beliefs through social interactions that take place within homogeneous groups. When these two processes occur simultaneously, users may experience limited access to differing perspectives while also receiving repeated reinforcement of their existing views.

The findings of this study are consistent with various studies showing that homogeneous information environments can increase the risk of opinion polarization. Users who continuously receive information that supports their views tend to develop stronger confidence in the positions they hold. At the same time, opportunities to understand arguments from other groups become increasingly limited. This condition can widen communication gaps between groups within the digital public sphere.

From the perspective of the Networked Public Sphere, social media was initially viewed as a space that enabled a more open and participatory exchange of information compared to traditional media.[37] The presence of digital networks allows individuals from various backgrounds to participate in public discussions without significant geographical barriers. However, the findings of this study show that the dominance of algorithms can alter the character of this digital public sphere. Instead of expanding information diversity, excessive personalization has the potential to create communication spaces segmented according to users' preferences.

The extent to which filter bubbles and echo chambers are formed differs across social media platforms. Platforms that rely heavily on recommendation systems based on user behavior tend to show higher levels of personalization. Conversely, platforms that still provide greater space for users to actively select information sources tend to show relatively lower levels of homogenization. This

[36] Cass R. Sunstein, #*Republic: Divided Democracy in the Age of Social Media* (Princeton: Princeton University Press, 2017), 72.

[37] Yochai Benkler, *The Wealth of Networks: How Social Production Transforms Markets and Freedom* (New Haven: Yale University Press, 2006), 215.

difference indicates that algorithm design plays an important role in determining the character of the digital information environment.

Although most studies indicate a tendency toward the formation of filter bubbles and echo chambers, several studies have found that these phenomena do not always occur absolutely. Users who have diverse social networks or actively seek information from various sources still have opportunities to obtain different perspectives. In addition, several platforms have begun to develop features aimed at expanding the variety of information received by users. These findings show that the impact of algorithms on information homogenization is influenced by the interaction between technological factors and user behavior.

Based on the research findings and engagement with previous literature, it can be understood that filter bubbles and echo chambers are consequences that emerge from the combination of algorithmic personalization and the structure of social interaction in digital media. These two phenomena contribute to the decline of information diversity and the increasing tendency of users to interact with views that align with their existing beliefs. In the long term, this condition has the potential to affect the quality of public discourse, strengthen social polarization, and limit the exchange of constructive ideas within the digital public sphere. Therefore, filter bubbles and echo chambers have become central issues in studies on the social impact of the dominance of algorithmic curation in contemporary social media.

Implications for the Critical Thinking and Digital Literacy

The dominance of algorithmic curation not only influences information distribution but also affects users' cognitive processes in understanding and evaluating the information they receive. This finding indicates that the quality of users' critical thinking is strongly influenced by the characteristics of the information environment shaped by algorithms. When users are more frequently exposed to information that aligns with their preferences, opportunities to evaluate differing perspectives become increasingly limited. Therefore, the issue of algorithmic curation is not only related to technology but also to the development of the intellectual capacity of digital society.

From the perspective of Critical Thinking Theory, critical thinking ability includes the skills to analyze arguments, evaluate evidence, identify bias, and formulate rational conclusions based on available information.[38] These abilities develop through interaction with diverse ideas, perspectives, and sources of information. The findings of this study show that information diversity plays an

[38] Robert H. Ennis, "Critical Thinking Assessment," *Theory Into Practice* 32, no. 3 (1993): 18-179.

important role in supporting critical thinking processes because it enables individuals to compare various viewpoints more objectively. Therefore, the decline in information diversity resulting from algorithmic personalization has the potential to affect the quality of critical thinking processes among social media users.

The research findings show that exposure to homogeneous information can reinforce users' tendency toward confirmation bias. Individuals tend to accept information that supports their beliefs more easily than information that contradicts those beliefs. In a highly personalized information environment, this tendency is further reinforced because algorithms consistently present content considered relevant based on previous behavior. Therefore, the process of critically evaluating information becomes less optimal because users are rarely confronted with intellectual challenges arising from alternative perspectives.

The findings also show that critical thinking ability cannot be separated from the context of digital literacy. Digital literacy is not only related to the ability to use technology, but also includes the capacity to understand, evaluate, and use information responsibly. In a social media environment controlled by algorithms, users need to understand that the information they receive is the result of a particular selection process that is not always neutral. Awareness of this mechanism is an important part of digital literacy competence in the era of digital platforms.

Within the Digital Literacy Framework, understanding how algorithms work is an increasingly relevant form of digital literacy.[39] Users who understand the basic principles of algorithmic curation tend to be better able to identify the limitations of the information they receive through social media. They are also more encouraged to verify information through various sources. Thus, algorithmic literacy has become an important component in strengthening critical thinking skills in the digital era.

The research findings indicate that users with high levels of digital literacy have a better ability to cope with the negative impacts of algorithmic personalization. They tend not to accept information passively and are more active in exploring alternative information sources. In addition, this group is better able to recognize the possibility of bias in the recommendation systems used by digital platforms. This condition shows that digital literacy can function as a protective factor against the risk of information homogenization.

[39] Luci Pangrazio and Neil Selwyn, "Personal Data Literacies': A Critical Literacies Approach to Enhancing Understandings of Personal Digital Data," *New Media & Society* 21, no. 2 (2019): 419-437, DOI: https://doi.org/10.1177/1461444818799523.

The findings of this study also indicate that education plays a strategic role in developing critical thinking skills and digital literacy. Educational institutions are no longer sufficient if they only teach technological skills; they also need to equip students with the ability to critically evaluate information. Learning about algorithms, misinformation, disinformation, and digital bias has become increasingly important in the context of a society that is highly dependent on social media.[40] Therefore, strengthening the digital literacy curriculum needs to be adjusted to the continuously changing digital information ecosystem.

In addition to the education sector, social media platforms also have a responsibility to support the creation of a healthier information environment. The findings of this study show that algorithm design has a major influence on the level of information diversity received by users. Therefore, platforms need to consider mechanisms that can increase exposure to more diverse perspectives without reducing the quality of the user experience. This can be achieved through the development of recommendation systems that are not only oriented toward engagement but also take into account the value of information diversity.

From a public policy perspective, the findings of this study indicate the importance of increasing algorithmic transparency in digital platform governance. Transparency enables users to gain a better understanding of the factors that influence information distribution on social media.[41] Algorithmic openness can assist researchers, regulators, and the public in identifying potential biases that may arise within recommendation systems. Thus, transparency becomes one of the essential prerequisites for creating a more accountable and inclusive digital information ecosystem.

Based on the overall research findings, it can be understood that strengthening critical thinking and digital literacy is an important strategy for addressing the dominance of algorithmic curation on social media. Information diversity, awareness of how algorithms work, and the ability to critically evaluate information are key competencies required in contemporary digital society. These efforts require collaboration among educational institutions, digital platforms, governments, and society as social media users. Thus, the development of digital literacy not only serves to improve users' technical skills

[40] Sayyidati Is'faalana Husna, et al., "Transformasi Digital dan Tantangan Demokrasi: Analisis Disinformasi Politik di Media Sosial Indonesia," *Jurnal Media Akademik* 4, no. 6 (2026): 1-18, DOI: https://doi.org/10.62281/sq57h636.

[41] Mike Ananny and Kate Crawford, "Seeing without Knowing: Limitations of the Transparency Ideal and Its Application to Algorithmic Accountability," *New Media & Society* 20, no. 3 (2018): 973-989.

but also strengthens their capacity to participate critically and responsibly in the digital public sphere.

D. CONCLUSION

The dominance of algorithmic curation has become a key characteristic of the contemporary social media ecosystem. Through data-driven personalization mechanisms, algorithms play a role in determining the visibility, distribution, and prioritization of information received by users. The results of the literature synthesis show that algorithmic recommendation systems contribute to the narrowing of information diversity by increasing exposure to content that aligns with users' preferences and interaction histories. This condition encourages the formation of filter bubbles and echo chambers, which have the potential to limit access to alternative perspectives within the digital public sphere.

In addition to influencing information diversity, the dominance of algorithmic curation also has implications for social media users' critical thinking skills. Exposure to homogeneous information tends to reinforce confirmation bias and reduce users' opportunities to critically evaluate various viewpoints. Therefore, strengthening digital literacy, particularly algorithmic literacy and critical thinking skills, has become an increasingly urgent need in digital society. This study emphasizes the importance of collaboration among educational institutions, digital platforms, researchers, and policymakers in creating an information ecosystem that is more transparent, diverse, and supportive of critical and democratic public participation.

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