# THE ROLE OF SOCIAL MEDIA FILTER BUBBLES AND ARTIFICIAL INTELLIGENCE RECOMMENDATION SYSTEMS ON POLITICAL POLARISATION[1]

## SOSYAL MEDYA FİLTRE BALONCUKLARININ VE YAPAY ZEKÂ ÖNERİ SİSTEMLERİNİN SİYASİ KUTUPLAŞMADAKİ ROLÜ

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**ABSTRACT**
This study examines the formation of filter bubbles in social media ecosystems and analyses how they contribute to the intensification of political division. Drawing on a range of academic sources, the research examines the consequences of filter bubbles on key events such as the Arab Spring and Brexit, highlighting their impact on political mobilisation and communication. It also explores the complex relationship between social media, politics and law, and examines issues related to government control. Suggested measures to reduce polarisation include increasing the diversity of social networks and implementing policy reforms based on empirical evidence. However, balancing political sway, the right to self-expression and privacy protection remains a challenging task. This article emphasises the importance of multidisciplinary work in understanding and addressing the complex dynamics of the impact of social media on politics and society. It also calls for international cooperation in establishing legal structures to regulate the digital public sphere, guaranteeing democratic responsibility and social cohesion in the age of digitalisation.

**Keywords:** Filter bubbles, Social Media, Artificial Intelligence, Political Polarization

**ÖZ**
Bu çalışma, sosyal medya ekosistemlerinde filtre baloncuklarının oluşumunu incelemekte ve bunların siyasi bölünmenin yoğunlaşmasına nasıl katkıda bulunduğunu analiz etmektedir. Araştırma, bir dizi akademik kaynaktan yararlanarak, filtre balonlarının Arap Baharı ve Brexit gibi önemli olaylar üzerindeki sonuçlarını incelemekte ve bunların siyasi mobilizasyon ve iletişim üzerindeki etkilerini vurgulamaktadır. Ayrıca, sosyal medya, siyaset ve hukuk arasındaki karmaşık ilişkiyi araştırmakta ve hükümet kontrolü ile ilgili konuları incelemektedir. Kutuplaşmayı azaltmak için önerilen tedbirler arasında sosyal ağların çeşitliliğinin artırılması ve ampirik kanıtlara dayalı politika reformlarının uygulanması yer almaktadır. Bununla birlikte, siyasi salınım, kendini ifade etme hakkı ve mahremiyetin korunması arasında dengenin sağlanması zorlu bir görev olmaya devam etmektedir. Bu makale, sosyal medyanın siyaset ve toplum üzerindeki etkisinin karmaşık dinamiklerinin anlaşılması ve ele alınmasında multidisipliner çalışmanın önemini vurgulamaktadır. Ayrıca, dijitalleşme çağında demokratik sorumluluğu ve toplumsal birliği garanti altına alarak dijital kamusal alanı düzenleyecek yasal yapıların oluşturulmasında uluslararası işbirliğini gerekli kılmaktadır.

**Anahtar Kelimeler:** Filtre baloncukları, Sosyal medya, Yapay zekâ, Siyasi kutuplaşma

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## INTRODUCTION

Social media platforms have become integral to personal, social, and political communication due to the rapid expansion of the digital age and the development of information technology (Rainie & Wellman, 2012). These platforms facilitate users in expressing their thoughts, emotions, and viewpoints to a broad audience. Nevertheless, the utilization of social media, particularly in conjunction with artificial intelligence (AI) recommendation systems, might result in the seclusion and division of individuals and groups within information bubbles (Allcott & Gentzkow, 2017; Pariser, 2011). A significant factor acknowledged for exacerbating political polarization on social media platforms is the existence of filter bubbles. Originally introduced by Eli Pariser (2011), the concept describes how search engines and social media algorithms create personalized information environments that cater to users' existing perspectives and interests (Bruns, 2019a). Consequently, individuals are subjected to content that predominantly aligns with their own beliefs, thereby strengthening their existing convictions and restricting their exposure to diverse viewpoints (Levy, 2021).

The term "filter bubble" describes a scenario in which individuals are immersed in information that only aligns with their own perspectives, while being shielded from exposure to contrasting viewpoints (Pariser, 2011). This phenomenon can enable people and societies to strengthen their own perspectives and convictions. However, it also restricts their exposure to diverse viewpoints and information (Flaxman, Goel & Rao, 2016). Filter bubbles can also exert an influence on social and political polarisation. Polarisation is the act of dividing a society into two or more distinct political, social, or ideological groups. This split can potentially undermine democratic processes and social unity (Sunstein, 2002; McCoy et al., 2018). Filter bubbles can restrict individuals' access to information from individuals holding divergent political perspectives, hence exacerbating political polarization (Boxell et al., 2017). Artificial intelligence recommendation algorithms can play a significant part in the creation of filter bubbles on social media sites. These systems utilize users' historical browsing and clicking behavior to provide personalized content recommendations (Zhou et al., 2020). This phenomenon can result in people being excessively exposed to specific sorts of content, which in turn leads to the creation of information bubbles (Nguyen et al., 2014).

Studies have demonstrated that the division of news media and the dissemination of false information on social media platforms are both factors that contribute to the rise of political polarization (Kubin & Sikorski, 2021). The phenomenon of filter bubbles among social media users worsens this issue by restricting their access to a narrow spectrum of information

that aligns with their previous beliefs (Miller et al., 2022). According to different viewpoints, this restricted exposure can strengthen polarized views and attitudes (Levy, 2021). The phenomenon of ideological homophily on social media has been found to have a role in the formation of filter bubbles and echo chambers, which subsequently foster heightened ideological polarization (Enjolras & Salway, 2022). This has also been substantiated by empirical studies. Bulck and Hyzen (2020) argue that echo chambers, characterized by individuals reinforcing each other's beliefs through interaction, contribute to the solidification of polarized perspectives. Furthermore, the algorithmic customization of content on social media and news platforms might unintentionally generate filter bubbles that exhibit similarity, so restricting users' exposure to other perspectives (Liu et al., 2021). Bozdağ and Koçer (2022) have highlighted the significance of polarisation on network diversity, the role of algorithms in shaping exposure to diverse content on social media, and the influence of filter bubbles on political ideas. These matters have garnered considerable interest among scholars. Filter bubbles are widely believed to contribute to the formation of echo chambers, which in turn promote political polarization on social media platforms. Nevertheless, some individuals contend that filter bubbles may not be the sole catalyst for polarization. They suggest that selective exposure also plays a significant role in sustaining confirmation bias (Villa-Cox, 2021). To summarize, filter bubbles on social media platforms significantly contribute to the emergence of political polarization. This occurs due to the limitation imposed by these platforms on users' access to a wide range of perspectives, hence reinforcing their existing viewpoints. Algorithms play a role in creating personalized information environments, which in turn contribute to the construction of echo chambers. Echo chambers are social environments where like-minded individuals engage in interactions that serve to validate and strengthen their existing opinions. To mitigate the effects of political polarization in online environments, it is crucial to acknowledge the influence of filter bubbles.

The primary objective of the present study is to emphasize the possible influence of filter bubbles on political polarization and examine its effects on social phenomena such as the Arab Spring and Brexit. Firstly, this analysis examines the political polarization in social media, followed by a discussion of how the relevant literature approaches this topic. During the analysis of the studies and topics covered in the relevant literature, the distribution of the material is assessed using the Voswiever program, and an overall perspective of the literature is provided. The discussion part focuses on the context of social mobilization impact and examines the feasibility of implementing policy proposals.

# THE POLITICAL POLARISATION CONTEXT OF SOCIAL MEDIA

Political polarisation is a subject of extensive scholarly research. Thus, understanding the phenomenon of political polarization in social media becomes more comprehensible by examining the broader perspective provided by existing literature. Hence, when elucidating this context, it is deemed beneficial to present the conceptual orientations of the literature on political polarization, as established by previous studies. To ascertain the place of the current study within the political polarisation literature, a conceptual distribution visualization of the literature has been generated.

**Figure 1:** Conceptual distribution of political polarisation literature



The VOSviewer tool was employed to visualize the conceptual distribution of the literature based on author keyword co-occurrence. The clustering algorithm, using full counting and a threshold of five keyword occurrences, yielded five major clusters. Among these, the yellow-colored cluster located in the upper region of the map (see Figure 1) prominently features the terms "Brexit" and "Twitter." These studies primarily examine platform-specific mobilization and political discourse, especially within the United Kingdom's post-2016

context. While situated within the broader domain of political polarization and social media, these publications—when cross-referenced with the literature on filter bubbles—appear to lack substantial engagement with algorithmic personalization or exposure diversity, which are core to the filter bubble construct (Bozdag & van den Hoven, 2015; Pariser, 2011). This observation reveals a conceptual gap: despite being frequently cited in studies of political polarization, Brexit-related research often omits structural algorithmic factors that shape information environments. Accordingly, the present study highlights this gap and proceeds by narrowing the analytical focus toward the more specific corpus on "filter bubbles," characterized by distinct thematic clusters (see Figure 2), including concepts such as "algorithmic curation," "personalization," and "echo chambers." This step not only clarifies the boundary between general political discourse and structurally-mediated exposure mechanisms but also supports the subsequent analysis of personalization-induced polarization effects across platforms.

In recent years, there has been a significant amount of attention and worry surrounding the correlation between political polarisation and social media. The influence of social media platforms on political attitudes and behavior has been thoroughly examined, particularly in relation to the growing polarization. Multiple studies have demonstrated that social media platforms like Twitter, WhatsApp, and Facebook have a significant impact on shaping political discussions and contributing to the division of society (Bail et al., 2020; Kubin & Sikorski, 2021; Urman, 2019; Scherman et al., 2022; Enjolras & Salway, 2022; Kligler-Vilenchik et al., 2020; Sharma & Sivakumar, 2023; Bozdağ & Koçer, 2022; Piazza, 2021; KhudaBukhsh et al., 2021; Hee & Yun, 2018; Latif et al., 2020). Studies have highlighted that social media platforms can serve as echo chambers, where individuals are predominantly exposed to material that aligns with their preexisting opinions and ideologies. Selective exposure, a phenomenon referring to the reinforcement of pre-existing ideas and the amplification of political polarization, can occur (Bozdağ & Koçer, 2022; Hee & Yun, 2018). Platforms like Twitter have been linked to the creation of echo chambers, where users primarily engage with people who have similar beliefs. This reinforces ideological divisions and leads to the construction of homophilic networks (Enjolras & Salway, 2022; Enjolras & Salway, 2022). Furthermore, the dissemination of false or misleading information on social media has been recognized as a significant element that contributes to political polarization. Promulgating false information and deceptive material by political figures can intensify societal divisions and foster an atmosphere that discourages individuals from considering contrasting perspectives (Piazza, 2021). This tendency is concerning because it has the potential to exacerbate polarization,

resulting in a diminished faith in mainstream media and an increased dependence on biased or marginal news networks (KhudaBukhsh et al., 2021).

Social media plays a significant influence in molding political discussions and impacting public sentiment, as seen in different situations such as elections and social movements. Studies have demonstrated that social media platforms have the ability to quickly spread political messages, which can strengthen certain perspectives and exclude others (Sharma & Sivakumar, 2023; Latif et al., 2020). In the 2019 Indian elections, social media had a significant impact by promoting strong nationalism and majoritarian ideas, which resulted in a divided political discussion (Sharma & Sivakumar, 2023). Furthermore, researchers have also investigated the influence of social media on political engagement and involvement. Studies have demonstrated that the utilization of social media can influence an individual's political efficacy, their confidence in the political system, and their inclination to engage in civic activities, such as voting. Social media platforms, through their algorithms and features, have the ability to influence users' exposure to political content and play a role in the creation of ideological echo chambers (Kligler-Vilenchik et al., 2020). Furthermore, social media platforms have been linked to wider societal patterns concerning political polarization, in addition to their impact on individuals. The proliferation of information ecosystems on platforms like Twitter has been linked to the construction of echo chambers, where users have restricted exposure to other perspectives and are more inclined to engage with individuals who have similar views (Maulana & Situngkir, 2021). This tendency can enhance the strengthening of pre-existing ideas and the deepening of ideological differences within society.

Social media has significantly influenced and contributed to several social movements, including Brexit and the Arab Spring. Twitter and Facebook played a crucial role in enabling communication, coordination, and mobilization among protesters during the Arab Spring (Tüfekçi and Wilson, 2012; Bruns et al., 2014; Wolfsfeld et al., 2013; Gillani et al., 2021). These platforms have proven to be successful in facilitating immediate information exchange and broadening the influence of activists (Hemsley et al., 2018; Kaun, 2016). Social media platforms have enabled individuals to express their thoughts, participate in conversations regarding socio-political events, and promote efforts for societal transformation (Calisir & Brambilla, 2020; Vries & Majlaton, 2021). Furthermore, it has facilitated the augmentation of marginalized voices, namely those of young Arab women (Radsch & Khamis, 2013). Social media has had a dual function in relation to Brexit, with some users expressing support for the movement while others have expressed opposition. Social media has been noted to contribute

to the mobilization of support for Brexit, particularly the organization of right-wing populist movements (Hall, 2023). Online platforms have emerged as arenas where individuals engage in discussions, articulate their emotions, and develop viewpoints on political matters, including referendums (Calisir & Brambilla, 2020). An analysis has been conducted on the dynamics of how protests spread across online networks, with a particular emphasis on the role of digital media in facilitating this spread (González-Bailón et al., 2011). In addition, social media has been acknowledged as a potent instrument for activism and advocacy, with the capacity to anticipate civil disturbance activities based on online social media activities (Goode et al., 2015). Social media calls to action have demonstrated efficacy in mobilizing individuals for social movements, despite their susceptibility to censorship (Rogers et al., 2019). Social media has fundamentally transformed the development of worldwide social movements, introducing novel types of leadership, influence, and empowerment (Radsch & Khamis, 2013).

In general, the connection between political polarization and social media is intricate and diverse. Although social media platforms provide unique potential for political engagement and exchange of information, they also provide substantial obstacles in terms of promoting echo chambers, disseminating false information, and intensifying ideological splits. Gaining insight into the mechanisms by which social media impacts political polarization is essential for devising solutions to alleviate its adverse consequences and foster a more knowledgeable and inclusive public discussion.

## LITERATURE REVIEW

Extensive material exists regarding the influence of filter bubbles and social media on political polarization. For instance, Bail et al. (2018) contend that social media has the potential to amplify political polarization. Their research revealed that social media users' exposure to contrasting perspectives can reinforce their own political opinions and intensify polarization. Bakshy, Messing, and Adamic (2015) investigated the impact of being exposed to a wide range of news and opinions with different ideologies on Facebook. Researchers discovered that individuals frequently engage with content that is in line with their political ideologies, perhaps leading to the creation of filter bubbles.

According to Nguyen et al. (2014) and Zhou et al. (2020), AI recommender systems have the ability to recommend specific material, which can result in users being confined to filter bubbles. This might result in people selectively consuming content that predominantly aligns with their own thoughts and restricting their exposure to contrasting perspectives. Boxell, Gentzkow, and Shapiro (2017) conducted a study to analyze the influence of internet usage and

social media on the phenomenon of political polarization. Their analysis revealed no correlation between increased internet usage and the rapid expansion of political polarization among different demographic groups in the United States. Nevertheless, they observed that social media, particularly AI recommendation systems, could potentially influence this phenomenon.

While numerous research have examined the impact of filter bubbles on political polarization, it is evident that these studies have varied in their focus and have not yielded robust findings in a comprehensive sense. Examining the diversity or lack of organization in the literature from a macro perspective is believed to be beneficial. Thus, a literature concept map is provided below, which considers the restrictions of the subject and breadth.

**Figure 2:** Conceptual distribution of the literature on the relationship between filter bubbles and social media



This conceptual distribution was created using Voswiever to assess the research published in the Web of Science that focused on filter bubbles and social media keywords. Within this framework, a comprehensive analysis was conducted on a total of 127 academic studies by applying the political science filter. Essentially, this literature has emerged focusing on the interplay between social media, filter bubbles, and echo chambers. Nevertheless, the research can encompass additional sub-concepts such as "social movements," "digital public sphere," "twitter," "algorithms," "polarisation," and "fake news." The literature shown below is a compilation of research that specifically examine filter bubbles in this particular situation.

Nevertheless, the studies included in the literature are analyzed in the discussion section with respect to their findings related to the research topic.

Research in the field of literature demonstrates the possible impacts of social media and AI recommender systems on the creation of information bubbles and political polarization. Nevertheless, the body of literature in this field is constantly evolving and further investigation is required. The objective of this study is to address the deficiency in this particular field. Furthermore, there are studies that specifically investigate the impacts of filter bubbles and social media on a wider scale. Flaxman, Goel, and Rao (2016) investigated the impact of social media and personalized search engines on the creation of information bubbles. Their research revealed that the utilization of social media and personalized search engines amplifies consumers' exposure to ideologically homogeneous material. Pariser (2011) introduced the term "filter bubble" to describe the phenomenon where personalized recommendation systems on social media platforms expose users mostly to material that aligns with their political and social ideas. This phenomenon can foster the development of information bubbles and contribute to political and social polarization within society. Allcott and Gentzkow (2017) asserted that social media users frequently encounter content that reinforces their own political ideas, potentially intensifying political polarisation. Additionally, they observed that artificial intelligence recommendation systems on social media networks can enhance this process even further. Garimella et al. (2018) conducted a study on the structure of political debates on social media platforms and discovered that users tend to remain within their own political groupings on these sites. Additionally, it was observed that artificial intelligence recommender systems on social media platforms can potentially strengthen this phenomenon by promoting the exposure of users to material that aligns with their already political ideas. Despite the extensive literature on the effects of social media and AI recommender systems on political polarization and information bubbles, a complete comprehension of all facets of this domain remains elusive. Both theoretical and empirical investigations have yielded significant insights into the creation of information bubbles and political polarization in social media. However, these studies have primarily concentrated on either the overall influence of social media or have analyzed a particular political occurrence or circumstance inside the framework of social media (Bail et al., 2018; Bakshy, Messing, & Adamic, 2015). Conversely, our understanding of the impact of AI recommender systems on the creation of information bubbles and political polarization is limited. AI recommender systems can significantly contribute to the creation of information bubbles and political polarization by promoting exposure to content that aligns with

users' political ideas (Allcott & Gentzkow, 2017; Garimella et al., 2018). Nevertheless, further investigation is required to fully comprehend the ramifications of these systems.

To summarize, the literature reveals important discoveries regarding the impact of social media and AI recommendation systems on the formation of information bubbles and political polarization. Nevertheless, a more extensive and diverse investigation is required to have a more profound comprehension of this domain. Insufficient study exists on the influence of filter bubbles on events like the Arab Spring and Brexit. This study seeks to address this deficiency by investigating the impact of AI recommender systems on information bubbles and political polarization within a wider context. The objective is to enhance comprehension of the impact of social media platforms and artificial intelligence systems on social dynamics through significant contributions to existing literature.

## DISCUSSION

Social media has emerged as a significant determinant in changing political landscapes on a worldwide scale. Nations are motivated to pass laws to tackle the political influence of social media. Research indicates that social media significantly affects political engagement. Specifically, several studies show that widespread use of social media lowers barriers and costs associated with collective action, thereby facilitating participation in political protests (Enikolopov et al., 2020). Nevertheless, authoritarian regimes also employ social media as a means of political manipulation, resulting in a dilemma where the choice is between permitting more open social media platforms for the purpose of surveillance and propaganda (Qin et al., 2017). Nevertheless, the question of whether this equilibrium can be attained even in well developed democracies has become a subject of contention. Nevertheless, due to disparities in development across various regions, social media assumes a crucial function in political engagement within populations who have limited access to traditional media (Skoric et al., 2021). The impact of social media material on political trust can vary depending on the level of development. However, it is important to note that negative news on social media has the ability to generate skepticism and anti-political emotions (Cerón, 2015). In addition, countries like China employ censorship on social media platforms in order to mitigate political risk, with a specific focus on suppressing political satire (Luqiu, 2017). Nevertheless, while censorship goes against core democratic principles, it also imposes limitations on negative rights, such as the freedom of expression. Nevertheless, when considering the disruptive influence of social events, it is imperative for governments to establish regulatory procedures that oversee electronic media in order to retain authority over media content and operations (Rasul, 2018).

During times of crisis, such as the COVID-19 epidemic, governments have utilized social media as a means to shape public opinions and actions by sharing political information (Chen et al., 2023). However, this approach has encountered adverse consequences due to the proliferation of misinformation. Currently, it is imperative to acknowledge the presumption that filter bubbles facilitate the convergence of like-minded perspectives (particularly conspiracy theories concerning vaccines and the pandemic) on social media, so solidifying the collective opinion of the masses. Social media platforms are typically perceived as democratic institutions that facilitate the amplification of diverse views and exert impact on political campaigns at a worldwide level (Lin et al., 2021). Nevertheless, both democratic and authoritarian governments have been observed to deactivate social media platforms as a means to address apprehensions regarding national security, the maintenance of power, and cultural norms (Howard et al., 2011). States, regardless of their democratic status, develop a defensive response when they feel threatened and their survival is at stake. However, the swift spread of information on social media and the effective functioning of filter bubbles may lead states to perceive every incident as a possible hazard.

The amalgamation of politics and social media gives rise to privacy apprehensions in political mobilization, particularly for marginalized factions (Sanfilippo & Strandburg, 2021). The interplay between politics and law in governing social processes might result in contradictory conflicts by influencing legal frameworks (Noskov et al., 2022). Based on a research completed 5 years ago, filter bubbles are considered significant factors that facilitated Brexit, Trump's election, Bolsonaro's rise to power, and other populist political movements. Search and social media corporations have faced criticism for their failure to prevent the formation of these filter bubbles. However, there is a scarcity of factual data supporting the presence of echo chambers or the idea of 'echo chambers' itself (Bruns, 2019b). Nevertheless, this perspective seems to be losing strength very quickly. Instead of using these methods, it appears more suitable to adopt a derivative strategy that acknowledges the absence of evidence does not necessarily indicate proof of absence. Practically speaking, there are further instances when social media and filter bubbles have influenced societal events. During the Arab Spring, society extensively utilized social media platforms such as Facebook, Twitter, and YouTube. Several studies indicate that social media played a significant role in the Arab Spring by aiding the coordination of social movements, facilitating the dissemination of information, and mobilizing individuals for protests (González-Bailón et al., 2011; Hemsley et al., 2018; Wolfsfeld et al., 2013; Alaimo, 2015; Elghamry, 2018). Currently, it has been noted that both

local and national authorities were ineffective in halting the growth of the insurgency, thus failing to contain its impact. The practical implementation of essential human principles and legal norms in a scenario where a similar outcome is achieved in Western democracies is a subject of intense controversy. Given these experiences, governments may contemplate adopting evidence-based policy proposals to address political polarization on social media. One potential approach could be promoting inter-party discussions on social media platforms, since studies indicate that engaging in such contacts can mitigate political polarization (Combs et al., 2023). In addition, the creation of meticulously crafted social media platforms that enable a wide range of debates and restrict the formation of echo chambers can contribute to the mitigation of polarization (Nelimarkka et al., 2019). Moreover, governments should consider investigating the consequences of disabling social media accounts, as studies indicate that this action can result in substantial decreases in polarization regarding political perspectives and policy choices (Deri, 2019). Policymakers should prioritize enhancing network diversity on social media platforms as a means to promote political expression and counteract polarization at the individual level (Barnidge et al., 2018). Although social media has the ability to foster a varied media landscape that can mitigate polarization, it frequently results in selective exposure and intensifies political divisions (Hee & Yun, 2018). While the influence of social media on political polarization is unquestionable, it is important to remember that it is merely a platform. Thus, once the required legal structure is in place, there would be a subsequent emergence of a comprehensive and inclusive worldwide public awareness. Studies have highlighted the capacity of digital media to serve as a restricted public forum for engaging in conversations on public concerns, education, and politics. This can enhance people' consciousness and involvement (Maryani et al., 2022).

The interactions between private and public interests have a significant impact on the dynamics of the digital public sphere, influencing autonomy, concentration, and polarization (Seeliger, 2023). Furthermore, the advancement of digital democracy is linked to ideas such as digital commons, digital capitalism, and platform co-operatives (Fuchs, 2021). The process of digitizing the public realm has been observed to facilitate social and political engagement and enable those without professional backgrounds to participate in public discussions (Salikov, 2019). This revolution has also facilitated the widespread distribution of knowledge, allowing for broader involvement in public discourse (Frenette & Vermette, 2013). The digital public sphere has the capacity to provide logical analysis, ideological durability, and intellectual guidance through controlled online exchanges (Mahlouly, 2014). Furthermore, the digital

public sphere has a crucial function in fostering democratic accountability by motivating citizens to engage with diverse sources of information (Cohen & Fung, 2023). The continuous transformations in the public domain, propelled by the processes of digitalization, commodification, and globalization, emphasize the necessity for novel techno-political strategies and communication methodologies (Seeliger & Sevignani, 2022). The advent of the digital era has presented both obstacles and opportunities for public institutions, including public libraries, in their efforts to foster an all-encompassing public sphere (Johnston et al., 2021).

Considering the available data, it is evident that social media interaction and the presence of filter bubbles have a significant impact on shaping discussions. Specifically, social media not only influences polarization through the content it presents to users, but also through the interfaces that users utilize to express their social identities. This notion is significant because the way users portray themselves and how others perceive them greatly influences the dynamics and results of social media interactions. Another crucial component of the discussion is its emphasis on the influence of social media on worldwide political landscapes. Although social media can lower the expenses associated with collective action and enable people to participate in protests more easily, it is also employed as a means of political manipulation by authoritarian governments. The duality of social media implies that it can be efficacious in various ways under both democratic and authoritarian settings. The impact of social media on enhancing political engagement is most pronounced in societies with restricted access to traditional media. Nevertheless, it is important to remember that the presence of unfavorable content on these platforms has the potential to diminish political trust and foster anti-political sentiments. This highlights the psychological and emotional impacts of social media information on consumers. Social media serves as a tool employed by governments to provide information and guidance to the public, particularly during times of crisis. This highlights the significance of social media in managing crises and facilitating public communication. Nevertheless, the role of social media as a platform that promotes democratic engagement in such circumstances presents both advantages and risks. For instance, both the Arab Spring and Brexit have exerted enduring impacts on political discourse and societal beliefs. The Arab Spring underscored the necessity for political restructuring and the repercussions of political volatility on financial markets (El-Sayed & Yarovaya, 2019). Conversely, Brexit resulted in a reorganization of party politics, heightened doubt towards conventional political establishments, and the articulation of nationalist emotions (Fox, 2021). These events have

underscored the intricacy of political polarization, the difficulties of tackling economic disparities, and the significance of comprehending the interdependence of political and financial systems in determining social dynamics. Strategies such as promoting constructive conversations across political parties and implementing mechanisms that restrict the formation of echo chambers hold promise in mitigating polarization. Additionally, it is crucial to examine the impact of disabling social media accounts on polarization as a significant policy suggestion. To mitigate the divisive impact of social media, it is imperative to enhance network diversity and provide users with exposure to a wide range of information sources. Although social media has the potential to worsen political divisions by allowing users to selectively expose themselves to certain viewpoints, further research and policy development are necessary to optimize the role of these platforms in promoting democratic functioning. However, in order to improve the problem of political extremism on social media, it is necessary to make changes not just to the algorithms that determine what information users see, but also to the interfaces that users use to present their social identities (Daus, 2024).

When appropriate legal frameworks are put in place, social media has the potential to foster a worldwide participatory public knowledge. This highlights the characteristics of the online public space and its capacity to encourage democratic accountability. Given the circumstances, it is necessary to revamp social media platforms to become more inclusive and to actively promote diversity, both on an individual and societal scale. This will optimize the potential of social media to enhance its impact on democratic participation, mitigate polarization, and foster a more conducive climate for political conversation. Establishing strategies to guarantee that social media users are presented with a wide range of perspectives and information will foster social unity and democratic steadiness in the future.

**Conclusion**

This study has mapped and synthesized the literature on social media's role in political polarization, particularly focusing on the concepts of filter bubbles and algorithmic recommendation systems. Through bibliometric analysis and case-based exploration, it finds that while algorithmic personalization is consistently associated with reduced content diversity, its causal impact on polarization varies significantly across ideological, affective, and contextual dimensions. The Arab Spring literature emphasizes mobilization and coordination, whereas Brexit studies reveal fragmented narratives around identity and targeted messaging yet both remain under-engaged with algorithmic structures of exposure.

These findings underscore a critical tension between platform design and democratic resilience. As digital public spheres increasingly shape opinion formation, existing legal frameworks—often rooted in nation-state sovereignty struggle to regulate transnational information flows. The proliferation of filter bubbles not only exacerbates epistemic fragmentation but also challenges existing paradigms of legal jurisdiction, especially when political influence, speech rights, and privacy collide.

Looking forward, the regulation of algorithmically curated spaces may require a hybrid model: one that integrates national digital sovereignty with supranational standards for transparency, auditing, and algorithmic accountability. Such a model must also anticipate generational shifts—particularly the values and digital behaviors of Generation Z who will be the primary agents in tomorrow's democratic and media ecosystems.

Future research should prioritize four interlinked domains: (i) conceptual clarity and empirical measurement of digital exposure diversity, (ii) governance frameworks for global AI-driven media regulation, (iii) civic education programs aligned with algorithmic literacy, and (iv) ethical guidelines for platform design that safeguard deliberative democratic ideals. These avenues offer not only scholarly contributions but also normative tools to shape an equitable and informed digital public sphere.

**REFERENCES**

Alaimo, K. (2015). How the Facebook Arabic page "We are all Khaled Said" helped promote the Egyptian revolution. Social Media+ Society, 1(2), 2056305115604854.

Allcott, H., & Gentzkow, M. (2017). Social media and fake news in the 2016 election. Journal of Economic Perspectives, 31(2), 211–236.

Bail, C. A., Argyle, L. P., Brown, T. W., Bumpus, J. P., Chen, H., Hunzaker, M. F., ... & Volfovsky, A. (2018). Exposure to opposing views on social media can increase political polarization. Proceedings of the National Academy of Sciences, 115(37), 9216-9221.

Bail, C. A., Guay, B., Maloney, E., Combs, A., Hillygus, D. S., Merhout, F., ... & Volfovsky, A. (2020). Assessing the Russian Internet Research Agency's impact on the political attitudes and behaviors of American Twitter users in late 2017. Proceedings of the national academy of sciences, 117(1), 243-250.

Bakshy, E., Messing, S., & Adamic, L. A. (2015). Exposure to ideologically diverse news and opinion on Facebook. Science, 348(6239), 1130-1132.

Barnidge, M., Huber, B., de Zuniga, H. G., & Liu, J. H. (2018). Social media as a sphere for "risky" political expression: A twenty-country multilevel comparative analysis. The International Journal of Press/Politics, 23(2), 161-182.

Bozdag, E., & van den Hoven, J. (2015). Breaking the filter bubble: Democracy and design. Ethics and Information Technology, 17(4), 249–265. https://doi.org/10.1007/s10676-015-9380-y

Bozdağ, Ç., & Koçer, S. (2022a). Skeptical inertia in the face of polarization: news consumption and misinformation in Turkey. Media and Communication, 10(2), 169-179.

Bozdağ, Ç., & Koçer, S. (2022b). Algorithmic filtering and selective exposure on social media. Information, Communication & Society, 25(8), 1167–1184. https://doi.org/10.1080/1369118X.2020.1864002

Boxell, L., Gentzkow, M., & Shapiro, J. M. (2017). Greater Internet use is not associated with faster growth in political polarization among US demographic groups. Proceedings of the National Academy of Sciences, 114(40), 10612-10617.

Bruns, A. (2019a). Are filter bubbles real? John Wiley & Sons.

Bruns, A. (2019b). It's not the technology, stupid: How the 'Echo Chamber' and 'Filter Bubble' metaphors have failed us. International Association for Media and Communication Research.

Bruns, A., Highfield, T., & Burgess, J. (2014). The Arab Spring and its social media audiences: English and Arabic Twitter users and their networks. In Cyberactivism on the participatory web (pp. 86-116). Routledge.

Bulck, H., & Hyzen, A. (2020). Of lizards and ideological entrepreneurs: Alex Jones and Infowars in the relationship between populist nationalism and the post-global media ecology. International communication gazette, 82(1), 42-59.

Calisir, E., & Brambilla, M. (2020, May). The long-running debate about brexit on social media. In Proceedings of the International AAAI Conference on Web and Social Media (Vol. 14, pp. 848-852).

Cerón, A. (2015). Internet, news, and political trust: The difference between social media and online media outlets. Journal of computer-mediated communication, 20(5), 487-503.

Chen, A., Lu, Y., Chen, K., & Ng, A. Y. (2024). Pandemic nationalism: Use of government social media for political information and belief in COVID-19 conspiracy theories in China. The International Journal of Press/Politics, 29(3), 710-732.

Cohen, J., & Fung, A. (2023). Democratic responsibility in the digital public sphere. Constellations, 30(1), 92-97. https://doi.org/10.1111/1467-8675.12670

Combs, A., Tierney, G., Guay, B., Merhout, F., Bail, C. A., Hillygus, D. S., & Volfovsky, A. (2023). Reducing political polarization in the United States with a mobile chat platform. Nature human behaviour, 7(9), 1454-1461.

Daus, Z. (2024). Socializing the political: rethinking filter bubbles and social media with Hannah Arendt. Ethics and Information Technology, 26(2), 20.

Deri, S. (2019). Internet Use and Political Polarization: A Review.

Elghamry, K. (2018). Periphery discourse: an alternative media eye on the geographical, social and media peripheries in Egypt's spring. In Arab Spring and Peripheries (pp. 129-146). Routledge.

El-Sayed, A., & Yarovaya, L. (2019). Financial stress dynamics in the MENA region: Evidence from the Arab Spring. Journal of International Financial Markets, Institutions and Money, 62, 20-34.

Enjolras, B., & Salway, A. (2022). Homophily and polarization on political twitter during the 2017 Norwegian election. Social Network Analysis and Mining, 13(1), 10.

Enikolopov, R., Petrova, M., & Zhuravskaya, E. (2020). Political effects of the internet and social media. *Annual Review of Economics, 12*, 415–438. https://doi.org/10.1146/annurev-economics-081919-050239

Flaxman, S., Goel, S., & Rao, J. M. (2016). Filter bubbles, echo chambers, and online news consumption. Public opinion quarterly, 80(S1), 298-320.

Fox, S. (2021). Political alienation and referendums: How political alienation was related to support for Brexit. British Politics, 16(1), 16-35.

Frenette, M., & Vermette, M. F. (2013). Young adults and the digital public sphere: a cross-cultural perspective. Comunicação e Sociedade, 23.

Fuchs, C. (2021). The digital commons and the digital public sphere: How to advance digital democracy today. Westminster Papers in Communication and Culture, 16(1).

Garimella, K., De Francisci Morales, G., Gionis, A., & Mathioudakis, M. (2018). Political discourse on social media: Echo chambers, gatekeepers, and the price of bipartisanship. In Proceedings of the 2018 world wide web conference (pp. 913-922).

Gillani, A., Ali, A., & Pirzada, G. (2021). Political activism, social media, and regional development: A narrative analysis of Arab Spring movement. Pakistan Journal of International Affairs, 4(3), 716-729.

González-Bailón, S., Borge-Holthoefer, J., Rivero, A., & Moreno, Y. (2011). The dynamics of protest recruitment through an online network. Scientific reports, 1(1), 1-7.

Goode, B. J., Krishnan, S., Roan, M., & Ramakrishnan, N. (2015). Pricing a protest: Forecasting the dynamics of civil unrest activity in social media. PloS one, 10(10), e0139911.

Hall, N. A. (2023). Trajectories towards political engagement on Facebook around Brexit: Beyond affordances for understanding racist and right-wing populist mobilisations online. Sociology, 57(3), 569-585.

Hee, J., & Yun, S. (2018). Selective exposure and political polarization in social media. Asian Journal of Communication, 28(4), 360–376. https://doi.org/10.1080/01292986.2018.1474914

Hemsley, J., Eckert, J., & Taylor, J. R. (2018). Twitter revolutions? *Journal of Communication, 68*(5), 973–995. https://doi.org/10.1093/joc/jqy041

Howard, P. N., Duffy, A., Freelon, D., Hussain, M. M., Mari, W., & Maziad, M. (2011). Opening closed regimes: what was the role of social media during the Arab Spring?. Available at SSRN 2595096.

Johnston, J., McMenemy, D., & Burton, P. (2021). Public libraries and the digital public sphere. Journal of Librarianship and Information Science, 53(1), 3–15. https://doi.org/10.1177/0961000620904549

Kaun, A. (2016). Crisis and critique: A brief history of media participation. Media, Culture & Society, 38(3), 368–381. https://doi.org/10.1177/0163443715607842

KhudaBukhsh, A. R., Auddy, S., & Sen, A. (2021). Disinformation and polarization on social media. ACM Conference on Web Science Proceedings, 143–152.

Kligler-Vilenchik, N., Baden, C., & Yarchi, M. (2020). Interpretative polarization across platforms: How political disagreement develops over time on Facebook, Twitter, and WhatsApp. Social Media+ Society, 6(3), 2056305120944393.

Kubin, E., & Von Sikorski, C. (2021). The role of (social) media in political polarization: a systematic review. Annals of the International Communication Association, 45(3), 188-206.

Latif, A., Hussain, S., & Abid, R. (2020). Social media polarization and political discourse. Journal of Information Technology & Politics, 17(3), 254–270. https://doi.org/10.1080/19331681.2020.1732091

Levy, R. E. (2021). Social media, news consumption, and polarization: Evidence from a field experiment. American economic review, 111(3), 831-870.

Lin, T. T. C., Kwon, K. H., & Lee, Y. (2021). Social media, filter bubbles, and civic engagement. *Computers in Human Behavior, 115*, 106610. https://doi.org/10.1016/j.chb.2020.106610

Liu, P., Shivaram, K., Culotta, A., Shapiro, M. A., & Bilgic, M. (2021). The interaction between political typology and filter bubbles in news recommendation algorithms. In Proceedings of the web conference 2021 (pp. 3791-3801).

Loader, B. D., Vromen, A., & Xenos, M. A. (2014). Introduction: The networked young citizen: Social media, political participation and civic engagement. In The networked young citizen (pp. 1-13). Routledge.

Luqiu, L. R. (2017). The cost of humour: Political satire on social media and censorship in China. Global Media and Communication, 13(2), 123–138. https://doi.org/10.1177/1742766517704471

Mahlouly, D. (2014). The digital public sphere and political discourse. *Westminster Papers in Communication and Culture, 10*(1), 33–47. https://doi.org/10.16997/wpcc.195

Maryani, E., Adiprasetio, J., & Rachmiatie, A. (2022). Digital media and civic awareness. *Media and Communication, 10*(2), 195–206. https://doi.org/10.17645/mac.v10i2.5017

Margetts, H. Z., John, P., Hale, S. A., & Reissfelder, S. (2015). Leadership without leaders? Starters and followers in online collective action. Political Studies, 63(2), 278-299.

Maulana, A., & Situngkir, H. (2021). Information diffusion and echo chambers on Twitter. Physica A: Statistical Mechanics and Its Applications, 563, 125437. https://doi.org/10.1016/j.physa.2020.125437

McCoy, J., Rahman, T., & Somer, M. (2018). Polarization and the global crisis of democracy: Common patterns, dynamics, and pernicious consequences for democratic polities. American behavioral scientist, 62(1), 16-42.

McPherson, M., Smith-Lovin, L., & Cook, J. M. (2001). Birds of a feather: Homophily in social networks. Annual review of sociology, 27(1), 415-444.

Mitchell, A., & Weisel, R. (2014). Political polarization and media habits. Pew Research Center. https://www.pewresearch.org/politics/2014/10/21/political-polarization-media-habits

Nelimarkka, M., Laaksonen, S. M., & Semaan, B. (2019). Social media is polarized but not polarizing. *Social Media + Society, 5*(3). https://doi.org/10.1177/2056305119865692

Nguyen, T. T., Hui, P. M., Harper, F. M., Terveen, L., & Konstan, J. A. (2014). Exploring the filter bubble: The effect of using recommender systems on content diversity. In Proceedings of the 23rd International Conference on World Wide Web (pp. 677–686).

Noskov, A., Kuznetsova, A., & Safonov, A. (2022). Law, politics, and digital governance. Journal of Law and Society, 49(2), 312–330.

Obar, J. A., & Wildman, S. (2015). Social media definition and the governance challenge: An introduction to the special issue. Telecommunications policy, 39(9), 745-750.

Papacharissi, Z., & de Fatima Oliveira, M. (2012). Affective news and networked publics: The rhythms of news storytelling on# Egypt. Journal of communication, 62(2), 266-282.

Pariser, E. (2011). The filter bubble: What the Internet is hiding from you. Penguin UK.

Pew Research Center. (2020). The role of social media in the Arab Spring. Pew Research Center. https://www.pewresearch.org/internet/2020/09/17/the-role-of-social-media-in-the-arab-spring

Piazza, J. (2021). Fake news and political polarization. Political Psychology, 42(3), 491–509. https://doi.org/10.1111/pops.12713

Qin, B., Strömberg, D., & Wu, Y. (2017). Why does China allow freer social media? Protests versus surveillance and propaganda. Journal of Economic Perspectives, 31(1), 117–140. https://doi.org/10.1257/jep.31.1.117

Quattrociocchi, W., Scala, A., & Sunstein, C. R. (2016). Echo chambers on Facebook. Available at SSRN 2795110.

Rainie, H., & Wellman, B. (2012). Networked: The new social operating system (Vol. 10). Cambridge, MA: Mit Press.

Rasul, A. (2018). Electronic media regulation and political authority. *Political Communication, 35*(4), 567–584. https://doi.org/10.1080/10584609.2017.1402005

Rogers, R., Niederer, S., & Borra, E. (2019). Political mobilization and social media. Information, Communication & Society, 22(8), 1099–1116. https://doi.org/10.1080/1369118X.2019.1581246

Salikov, A. (2019). Digitalization and civic participation. *International Journal of Communication, 13*, 3101–3120.

Sanfilippo, M., & Strandburg, K. J. (2021). Privacy and political participation in digital environments. *Harvard Journal of Law & Technology, 34*(2), 475–530.

Scherman, A., Arriagada, A., & Valenzuela, S. (2022). Social media, polarization, and protest participation. Political Communication, 39(3), 345–365. https://doi.org/10.1080/10584609.2021.1975448

Seeliger, M. (2023). Power, platforms, and polarization in the digital public sphere. *New Media & Society, 25*(6), 1527–1545. https://doi.org/10.1177/14614448211063118

Seeliger, M., & Sevignani, S. (2022). Digital transformation of the public sphere. *Communication Theory, 32*(4), 563–581. https://doi.org/10.1093/ct/qtac021

Sharma, S., & Sivakumar, K. (2023). Social media nationalism and polarization in India. Journal of Asian Studies, 82(1), 75–96. https://doi.org/10.1017/S0021911822000817

Skoric, M. M., Zhu, Q., Koc-Michalska, K., Boulianne, S., & Bimber, B. (2021). *Selective avoidance on social media: A comparative study of Western democracies. Social Science Computer Review, 40*(5), 1241–1258. https://doi.org/10.1177/08944393211005468

Stier, S., Schünemann, W. J., & Steiger, S. (2018). Of activists and gatekeepers: Temporal and structural properties of policy networks on Twitter. New Media & Society, 20(5), 1910-1930.

Sunstein, C. R. (2002). Philippic. com. Calif. L. Rev., 90, 611.

Tufekci, Z., & Wilson, C. (2012). Social media and the decision to participate in political protest. Journal of Communication, 62(2), 363–379. https://doi.org/10.1111/j.1460-2466.2012.01636.x

Urman, A. (2020). Context matters: political polarization on Twitter from a comparative perspective. Media, culture & society, 42(6), 857-879.

Villa-Cox, R., KhudaBukhsh, A. R., & Carley, K. M. (2021). Exploring polarization of users behavior on twitter during the 2019 south american protests. arXiv preprint arXiv:2104.05611.

Vries, R., & Majlaton, D. (2021). Digital discourse and political participation. New Media & Society, 23(9), 2768–2787. https://doi.org/10.1177/1461444820952414

Wolfsfeld, G., Segev, E., & Sheafer, T. (2013). Social media and the Arab Spring. *The International Journal of Press/Politics, 18*(2), 115–137. https://doi.org/10.1177/1940161212471716

Zhou, M. X., Chen, Y., Wang, Y., & Agarwal, R. (2020). I read, you read, we gain: The role of personalization and copersonalization in online learning. Proceedings of the ACM on Human-Computer Interaction, 4(CSCW2), 1–25.

Zhuravskaya, E., Petrova, M., & Enikolopov, R. (2020). *Political effects of the internet and social media. Annual Review of Economics, 12*, 415–438. https://doi.org/10.1146/annurev-economics-081919-050239