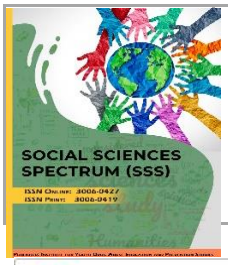

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The Role of Social Media Algorithms in Fueling Radicalization in Pakistan

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Abstract

This research paper reviews key considerations at the intersection of AI, digital recommender architectures, and socio-political stability in the Global South, with a detailed focus on how social media algorithms can exacerbate radicalization in Pakistan. The digital sphere in Pakistan has registered dramatic growth in scope over the last ten years, and it has essentially become an algorithmically mediated, polarized arena. Commercial considerations focus on engagement levels, user retention, and monetization of emotional reactions, which drive the structural design of algorithms to promote emotionally extreme, polar, and emotionally charged material. This qualitative study adopts a conceptual and analytical research design-based on the conceptual dimensions of optimization models (predictive engagement metrics, behavioral profiling, dynamic feedback loops, and automated collaborative filtering are defined, and their systemic operation is correlated with Pakistan's very fragmented sociopolitical, sectarian, and hyper-partisan environment. This study can be seen as a tool for analyzing and breaking down the exact ways in which platforms like Facebook, TikTok, and X (formerly Twitter) facilitate epistemic isolation and create algorithmic religious authority. The study reveals the mechanism through which algorithmic bias creates localized vulnerabilities and sets in motion a process of failing to recognize non-violent political extremism and then speeds up processes of violent radicalization, particularly targeting young people. This paper recommends transparent algorithmic governance, practical policy options, laws, and engineering mitigations that could foster a counter-productive process without contravening core digital freedoms in transitional democracies.

Keywords: Radicalization, Social Media, Pakistan, Digitalization, Extremism.

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Introduction

The global spread of information and communication technologies in the Global South has reshaped the very infrastructure of participatory democracy, political communication, and identity building. In the past, institutions such as state-approved TV broadcast channels and newsprint were used to control information flows in semi-democracies, and those associated with them, including traditional community leaders. Yet in Pakistan, a country that suffers from a huge youth bulge and high smartphone adoption, the whole edifice is being circumvented by social media platforms. These public markets were once envisioned as a democratic and pluralistic public square, but have contained harsh and systemic sociopolitical side effects due to the commercial framework in which they operate today. Instead of being considered a neutral, passive medium of human connection, social media platforms of contemporary times are artificially engineered and highly optimized digital infrastructures, operated by a complex artificial intelligence and machine-learning pipeline that taps into human cognitive vulnerabilities to enable continuous economic monetization by the platform (Hassan, 2018; Khan, 2025).

This research paper aims to provide a formal and multi-dimensional academic study on the structural dynamics that facilitate and perpetuate the radicalization process on social media in the modern era in Pakistan. First, the paper examines theoretical underpinnings of echo chambers, reverse-engineers the algorithms of popular social media platforms for recommendations, and critically analyzes similar regional contexts to develop a comprehensive analytical toolkit to tackle and understand the digital amplification of extremism.

This sociotechnical paradigm is based on the engagement maximization model. The performance of the digital recommender systems and algorithmic feed architecture are optimized for the following metrics to be maximized: (1) number of daily active users, (2) users' session duration, and (3) click-through rates. Humans' cognitive machine is particularly prone to detecting threats, moral outrage and acute inter-group conflict, processes naturally driven by positive reinforcement, and thus eminently suited for perfect optimization. All of this results in systematic reinforcement of sensationalising, polarising and/or extreme language, thereby making public discussion of a problem in an attentive, moderate and/or unifying way more difficult. This algorithmic amplification has led to a number of security paradoxes for the country, in the context of historical divisions, deep sectarian conflicts and strong political polarization. In many aspects, platforms have enabled and promoted not just the facilitation but also the promotion of radicalization by non-state armed groups, populist political groups and fringe religious groups (Awan, 2025; Risius et al., 2023; Whittaker et al., 2021).

Literature Review

A closer look at current academic research on the Pakistani digital space reveals an alarming correlation between algorithmic manipulation, the polarization generated by algorithms, radical ideology – glorification of violence – and the systemic threats to the nation's stability. In the landscape of Pakistani politics, Artificial Intelligence (AI) has emerged as a powerful player, changing the dynamics of political conversations and discourse for the better. In the political world of Pakistan, Artificial Intelligence (AI) has been a major influence, shifting the center of political discourse and debate to the middle, which is an essential component of democracy. AI is active and highly distortive, operating on renowned social media platforms, and unfriendly to public opinion. The algorithms gradually add sensationalist, emotionally charged political arguments and phrases with high ratings, thus increasing extremist perspectives in public discussion. This structural bias exacerbates affective polarization on a national scale, creating an all-pervading

phenomenon by which normal political competition becomes extremely poisonous, existential zero-sum games, and a disruption of the democratic process is perceived as a compromise, an ideological betrayal. Empirical case studies conducted on Pakistani youth confirm both the direct link between youth and the process of identifying political orientations resulting from excessive social media use, as well as the measurable impact of this use on these orientations (Javed & Javed, 2023; Khan et al., 2023; Maqsood et al., 2023).

Pakistan's youth inclination towards nonviolent extremism and social media.

Although initial scholarship in the West on radicalization used to concentrate on a preceding short-term process to actual violent acts and terrorist operations, recent studies have emphasized a critical, algorithmically driven middle-term stage marked by the development of deep ideological non-violent extremism. Tracking the Pakistani youth population over several years' shows that recommender systems are very effective in incubating this type of non-violent extremism and sparking the acceptance of intolerant, exclusionary, and highly anti-pluralistic worldviews among high numbers of youth users. Although these forms of digital media do not necessarily lead to physical militant action, they produce a highly volatile public that is ideologically rigidified. This makes them highly susceptible to radical and populist manipulation. It has been evident that the digital utterances of the political class, which, in turn, are activated by platform-based trend filters, directly influence political intolerance, hate speech, and personal violence among the country's young people, thereby fundamentally undermining the social contract (Ali & Sultan, 2026; Asif et al., 2025; Sahoo, 2025).

Pakistan's digital arena and susceptibility of extremism.

Among Pakistan's social and historical vulnerabilities, religious radicalization has been one of the more recent significant issues, with a major shift to digital platforms that has vastly increased its operational reach and pace. With the advent of modern social media, there is an unprecedented ability for algorithmically fast, geographically flexible, and institutionally resistant communication for the reach of extremist ideologues. Researchers have pointed to the databases that moderate control on platforms such as Facebook as specific tools that have the power to foster religious extremism. The algorithmic group recommendation and newsfeed prioritization mechanisms systematically create religious intolerance by focusing on content related to the group's historical grievances, threats from the other group, and aggressive moral defense narratives. This is further emphasized by diagnostic surveys which were carried out with local religious authorities (heads of the mosques) in Pakistan and which found a broad consensus among them on the adverse consequences of algorithmic designs on the popularization of traditional religious frameworks and the disengagement of vulnerable young Muslims from them towards sensationalist interpretations of faith (Butt & Ashfaq, 2024; Hussain, 2025; Suhaib & Adnan, 2020).

Algorithmic polarization and radicalization, when they reach systemic proportions at a national level, directly become a threat to a country at a geographical war zone level, like Pakistan. Social media is a structural weapon and has become a major multi-dimensional threat to national stability in Pakistan in the recent past. The algorithmically engineered, highly open architecture of contemporary social media platforms can be exploited by foreign intelligence adversaries, domestic insurgent networks, and violent non-state actors. The actors conduct very well-orchestrated hybrid warfare campaigns, which involve systematic violation of social cohesion within the population, aim at weakening the security of some of the people's institutions, and trigger civil unrest. Specific trends generated case studies demonstrate, across various platforms,

how these pipelines can be easily manipulated by automated bots to create fabricated political crises or “real” physical violence in the real world. Rapid dissemination of algorithmic content far outstrips the regulatory, defensive, and counter-narrative capacity of the nation's security institutions and is an enormous hidden cost of the rapid digitization of Pakistan (Abid, 2022; Awan, 2025; Shabir & Roman, 2025).

Theoretical Framework: The Sociotechnical Mechanics of Extremism

Conceptually, it is essential to break down the exact algorithmic processes that shape platform structure and to incorporate platforms into existing communication theories to comprehensively map the paths of digital radicalization in Pakistan. Socio-technical augmentation of extremism is not a construct in a vacuum, but rather the structural result of dense, opaque technical conditions that interact with human psychology and abnormalities in the local (socio-)political terrain. In modern applications, a collaborative filtering and matrix factorization model is used to curate and personalize the user feed. These sophisticated systems generate a complex, multidimensional vector space by computing cosine similarities between user engagement metrics, past user activity, and content metadata features. The algorithm recalibrates each user's “ideological coordinate” in its "mathematical space" based on interactions with specific media, including lingering on certain media, posting in a comment section, or sharing a post. If a person even shows a little, it can seem passive, engagement to one particular aspect of hyper-partisan and/or nationalistic and/or sectarian material, then it should rapidly be associated by a system of collaborative filtering with other clusters of users who are highly engaged in even more extreme versions of that kind of material. Architectural processes may lead to and reinforce the well-documented phenomenon of the “rabbit hole” (Kursuncu et al., 2019; Govers et al., 2023) whereby users are systemically guided on progressively radicalized, highly insular worldviews, from mainstream curiosity straight to those of extreme fringe views.

The more relevant and personalized the relevance, the more the epistemic bubbles and echo chambers will crystallize. The use of psychological cultivation theory and filter bubble theory to analyse the social media algorithms shows that there are several highly curated micro-informational niches in the algorithm that gradually and systematically marginalise users with different ideological perspectives. If social media algorithms are analyzed in light of psychological cultivation theory and filter bubble dynamics, it can be found that, according to psychological cultivation theory, social media algorithms have constructed a number of personalized information micro-niches that are highly sutured and systematically isolate individuals from different ideologies. As users are continually exposed to content clearly designed to reinforce existing worldviews and confirm behavioral biases, algorithms serve to reinforce worldviews, actively negate alternate perspectives, and increase animosity toward out-groups. This repeated reinforcement gradually shapes the user's baseline perception of social reality, gradually reducing their cognitive flexibility, as they increasingly trust this way of thinking. The continued reinforcement over time narrows the user's baseline perception of social reality and engrains it as their baseline way of perceiving it. Normalization is then created by users/phenomena of extreme and radical positions, which eventually become the users' digitally manufactured “consensus”, and towards which the individual shows high tolerance to moderation or other ideas. (Missier, 2025; Rodilosso, 2024; Valentini et al., 2020).

The algorithms that power platforms such as TikTok's recommendation system, Amazon's AI-enabled auto-completion search, and Netflix's ‘Suggest similar TV shows' feature are all an incredibly aggressive and calloused optimization workflow as they readapt their strategies to the

push and pull dynamics of the social media landscape. These loops are not just built around likes and follows, but around users' time on the platform – inching up to the millisecond of whether they stay or leave. If this optimization technique were applied to politics or religion, it definitely would favor short content that contains lots of "happy: repeatedly, highly stimulating, visually exciting, and intellectually reducing elements. The formats are particularly suited to expressing emotions that are polarizing, high in arousal, and negative, like moral outrage, anger, and historical grievance. Despite the fact that a user's focused gaze could be a result of a shock, disagreement, or morbid curiosity, the algorithmic pipeline treats it as a positive reinforcement signal, and, in a short span of time, translates a user's feed to a self-reinforcing, highly polarized self-reinforcement closed loop that readily encourages self-radicalization (Shin & Jitkajorn Wanich, 2024).

Research Methodology

Structural Analysis: Mechanisms of Digital Radicalization

The socio-technical and cultural dynamics that emerge when a universal Silicon Valley optimization model is used within such a complex, divided, and post-colonial society as Pakistan, require more than being merely a sociological characteristic or a trend to be understood. Pakistan's demographic bulge is huge and majority of its people belong to youth class. We are the prime consumer of algorithmically powered short-form video platforms and mobile apps. Cognitively, psychologically speaking, adolescents' and young adults' minds are very complex, in a state of forming identity, experiencing high levels of socio-economic anxiety about the employment trajectory, and thirsty for giving structural meaning and belonging in life. Platform algorithms are specifically designed to identify and capitalize on unconscious psychological vulnerabilities, leveraging a precise understanding of behavior. Algorithmic networks systematically deliver ideology-driven answers to these complex socio-economic grievances, based on minute details of user behavior, including scrolling speeds, search interactions, and dwell time. This self-radicalization process becomes an automatic phenomenon, gradually and systematically isolating youth from the protective effect of their physical families, in the management of their educational environments, and within their traditional communities (Hatim et al., 2025; Rafiq et al., 2026).

Algorithmic upshots on religion in Pakistan.

Religious authority has been significantly redefined in Pakistan as one of the most transformative and subversive effects of platform algorithms. Islamic scholarship and the production of fatwas were, traditionally, administered by localized layers of institutions with strictly defined functions and a highly regulated network of “gatekeepers” (gate people) in the community who tended to give greater weight to social harmony, a context-appropriate understanding of the theological message, and local rulings. However, the widespread use of engagement-oriented social media recommendation systems has ushered in a novel age of algorithmic religious power in the social network era. The theological, academic, and historical soundness or worthiness of a religious speech and perspective is beyond the capacity of recommender algorithms – only the metrical activity, views, and watch time, plus emotional resonance. As a result, digital preachers with a particularly aggressive tone, who blanket-handedly assert sectarian 'exclude-and-exclude' declarations, or who provide a more radicalized version of theological concepts that have multiple nuances, exist within the system and are increasingly rewarded for their disproportionately large, organically driven algorithmic reach. As online fatwas proliferate on social networking platforms, they radicalize critical voices, enabling them to completely bypass traditional structures of religious policing and build sizable (perhaps massive) congregations on the internet (Adel & Numan, 2023; Akmaliah, 2025; Zafar & Blackmer, 2025).

Social Media Exacerbates Societal Segregation in Pakistan.

The existing historical and social divides of Pakistan are extremely deep, storied and include a number of fault lines on sectarian, Ethnic, and hyper-partisan political lines. These pre-existing social tensions mean that social media algorithms are powerful amplifiers of social systems. The quest to maximize engagement drives users to create high-echo into ultra-isolated and mutually exclusive collaborative filtering pipelines, creating digital Pakistani spaces that are Pakistani. As user engagement is championed without wavering, collaborative filtering pipelines automatically carve out Pakistani digital spaces into ultra-isolated and mutually exclusive echo chambers. Anyone who shows any mild, fleeting curiosity about a certain sectarian or political point of view is quickly immersed in a narrower and less enriching national debate. In each of these closed, online spaces, animosity toward the other group is developed and polished for retention. The filter bubble keeps rigid walls between the rigid rhetoric dehumanizing religious minorities and the outside looking in, and between online anti-non-Christian rhetoric and a coordinated effort to manufacture false narratives. This cascading process of in-group purification and out-group threat is not limited to the virtual space but has real-life repercussions too, leading to mob movements, sectarian targeted violence, and ongoing political unrest in the land of the state (Kuncoro & Hasanah, 2024; Nadeem & Ali, 2025; Sarwar & Safdar, 2025).

Comparative Regional Context: The Global South Perspective

Algorithmic radicalization in Pakistan cannot be a stand-alone issue and has profound architectural and systematic similarities across the Global South, especially with contiguous South Asian countries. It is essential to acknowledge these regional influences, and it should be understood that the issue is one of systemic vulnerability built up as a result of the introduction of engagement first platforms in a ‘Western' architecture in a highly complex, ethnically and religiously diverse nation in a developing region. The role of digital algorithms as dynamic structures of radicalization in their Pakistani usage is nearly identical in Bangladesh, an adjoining nation. Research focused on context, in the Global South, shows that algorithms are structural pipelines, which support a systematic shift from casual religious involvement to active and violent militancy. Plans for local conditions have been extensively used by extremist groups throughout the region to promote and legitimize Islamist militancy on social media platforms. As in Pakistan, there is a highly vulnerable youth population in Bangladesh with respect to these dynamics. Algorithmically recommended loops actively capitalize on socio-economic pressures, exacerbate job prospects and identity crises among young users, and systematically funnel them into radicalized online organizations and extremist networks, thereby thwarting them even after they reach the surface of these loops (Ahmed, 2025; Sharma, 2024; Talukder & Tanvir, 2022).

A parallel and equally destructive process can be seen in India's digital public sphere, where vast platforms and operations interact with a complex, multilingual, multi-ethnic, and multi-religious Indian culture. Studies on the Indian digital landscape show how digital propaganda, hyper-targeted political messages, and advanced automated political bots are being used systematically to fuel polarized politics. Platform algorithms often oversaturate mainstream nationalist narratives and the most polarizing communal stories, as they attract large audiences. As microblogging sites have been automated to promote trends on Twitter, and encrypted messaging has enabled inflammatory content to be rapidly moderated and spread by organized political actors, the precise ways algorithmic vulnerabilities can be systematically exploited by such actors are illustrated. This exploitation is employed as a way to increase the polarization in society, fuel hatred against minorities, and provoke devastating communal violence in the real world. From the above

comparative regional perspective, it is clear that globally, in all of Pakistan and Bangladesh and India, the basic commercial structure of the social media platforms continually reinforces their regional level sociopolitical vulnerabilities and draws them into global networks that are extremely effective in systemic radicalization and in the creation of pan-regional instability (Neyazi, 2019; Droogan et al., 2018; Nadeem et al., 2023).

Results and Discussion

What is required, rather, is to take this situation of radicalization in Pakistan by algorithm beyond "just" reacting to content, which is superficial and flawed. Requires an integrated solution with a multi-sectoral approach, with substantial technical reengineering, comprehensive legislative measures, and extensive/public education activities to foster society's resilience. First, the main mitigation strategy should address the core problem of the crisis – the monetization model of engagement at all costs. In Pakistan, digital platforms and services need to be made to dramatically change their underlying algorithm optimizations. Typical agent-based recommender systems need to be technically redesigned to shift focus from maximizing short-term, high-arousal "engagement" signals, such as share counts, angry responses, or short-term upticks in watch time. Optimization matrices, however, should focus on the user's long-term health, content diversity, and the fact that the metrics are explicit measures of domain authority. In addition, platforms should be mandated to activate automatic algorithmic circuit breakers when they deem that a critical national security situation, an acute political situation, or a new incident of sectarian tension is occurring. These technological features would suspend trending algorithms; stop automated recommendations of political and religious groups; and intentionally reduce the pace of content velocity at network levels (Amit et al., 2021; Tahat et al., 2024).

Legislative and Regulatory Measures.

The state of Pakistan should build a highly sophisticated framework of rights-respecting regulation, capable of legally and financially enforcing accountability from the major technology companies for systematic harms caused by algorithms, thus curbing the process of digital autocratization. Strictly independent academic institutions and civil society bodies should have full access to platforms' recommender source codes and data audits of the internal system, imposed by law, with the active participation of government regulatory bodies. Platforms should provide clear, transparent information on exactly how their models rank, process, and share ideological and religious material in the country. Pakistan should introduce a concept of "duty of care" for digital platforms, which is inspired by the development of an international framework. These tough laws would impose heavy fines on tech companies if hate speech or incitement to violent extremism were amplified by their designs, continuous recommender systems, and the lack of culturally sensitive local teams to moderate content (Bagitova et al., 2024; Gaikwad et al., 2021).

Censorship and Right to Free Speech.

However, much like most forms of digital censorship, up-down digital censorship often raises significant free speech concerns and may contribute to political polarization, even as it helps suppress those subjected to it. In addition, while there are certainly important types of investment in defensive censorship, such as up-down digital censorship, the investments in freedom of expression awareness that accompany it can raise serious freedom of expression concerns, thereby incentivizing the growth of anti-state consciousness. Federally and provincially, education departments need to systematically embed critical social media literacy into the educational programs of secondary and higher schools, as well as the national grade program. Studies show

that people who are systemically trained in these skills acquire the important cognitive ability to critically examine digital content, assess the consistency of deceptive algorithmic manipulation strategies, and navigate the complex digital environment in a protected way. At the same time, strong cooperation is also needed between state institutions and civil society alliances, as well as progressive digital creators, in actively creating digital counter-narratives that focus on strengthening the religious and political environment within cyberspace through the promotion of interfaith harmony, democratic pluralism, critical thinking, and social equality (Mansyur et al., 2026; Nawawi et al., 2025).

Conclusion

The confluence of per-concerned machine learning algorithms with Pakistan's exceedingly complex socio-political fabric poses a significant challenge to national security, social cohesion, and democratic development in the medium- to long-term. A comprehensive study that conclusively shows that modern social media algorithms are far from neutral and passive social mechanisms, but rather are actively, commercially optimized amplification mechanisms that systematically exploit humans' cognitive vulnerabilities to maximize financial returns. These "technical infrastructures" constantly boost and perpetuate high-thrill, emotionally charged, sensationalist narratives, and subsequently divide the public sphere into radicalized, self-referential "echo chambers. They over-index to high-thrill, emotionally charged, sensationalist stories, and then isolate the public sphere into insular, radicalized echo chambers. In the unique geopolitical setting of Pakistan, this algorithmic bias has contributed to a surge in affective political polarization to an unprecedented degree, paved the way for the dangerous growth of non-violent political extremism in a massively large youth population, and created conducive conditions for spiraling towards violent religious radicalization.

In addition, regressive, exclusivist, and militant interpretations and ideologies are sweeping in an unprecedented manner, with the spread aided in great measure by the elimination of traditional, venerated religious structures and belief systems by an unsupervised and algorithmically produced religious authority. Internet shutdowns, the abrupt and wholesale banning of content by any government or politically motivated authority, and digital censorship fall into the "quick fix" category, and they are counterproductive at the end of the day, as they harm democratic principles and suppress economic innovation. Rather, Pakistan should adopt a complex, multidimensional approach. This will require lawmakers to impose strict responsibilities on transnational tech giants to change their optimization models so that they also take safety as a criterion, framing algorithmic transparency and accountability measures, make robust algorithms and users' concerns an integral part of the national education system from the start, and actively promote inclusive, moderate, and pluralistic alternatives. In this algorithmic era, only by altering the underlying dynamics of the digital public square in Pakistan can it safeguard its collective cognitive security, neutralize online radical vectors, and pave the way for a stable, democratic, and pluralistic future (Awan, 2025; Khan, 2025; Tahat et al., 2024).

Recommendations

This study suggests a holistic and balanced solution to tackle the problem of social media algorithms in the context of radicalization in Pakistan, which integrates technological, regulatory, educational, and societal solutions. Social media platforms should implement clear and responsible algorithmic governance processes, such as independent algorithm audits, explainable systems that rank content, and content moderation systems designed to reduce the spread of extremist, hateful and polarizing content. There is a need to reinforce the partnership between technology firms and

researchers and policy makers to create tools based on artificial intelligence that are sensitive to context and can detect harmful patterns while maintaining freedom of expression and digital rights. The government needs to develop evidence-based regulatory frameworks that foster accountability, data protection and platform responsibility, while avoiding over-censorship and limiting legitimate political and religious speech. There is a need for digital literacy initiatives, especially for young users, in educational institutions and various civil society groups to help build awareness of the impact of algorithms, misinformation, on-line manipulation, and the psychological effects of continuous exposure to extreme narratives. Youth organizations, community leaders, religious scholars should be involved in driving positive conversations online and countering extremist views in a credible digital dialogue. Moreover, studies in Pakistan involving computer science, sociology, psychology, media, and security should be carried out together to gain a deeper insight into the connection between algorithmic systems and the radicalization path in Pakistan. Through facilitating collaboration between technology companies, government institutions, academia, and communities, it can be possible to create strategies and measures for preventing algorithmic harms that will allow Pakistan to retain the innovative potential of social media, while keeping privacy, democratic participation, and fundamental digital freedoms intact.

Conflict of Interest

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