Role of Computational Propaganda in Political Polarization and Social Fragmentation among Urban Youth in Pakistan (A systematic Review)

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Abstract:
What we are about to explore in this article is the intricate phenomenon of computational propaganda and post-digital techniques, and how they are now used by people with an opinion in the digital age. This paper attempts to be a cross between empirical research and theoretical frameworks devoted to understanding the phenomenon of computational propaganda. This paper will showcase how the dynamics of information dissemination have shifted over time, bending human perceptions around it. The strategic application of algorithms, automation and immersive technologies by political actors and other stakeholder groups to impact public speech or influence their decision-making process. And further, this paper presents issues about ethics and regulation in the dissemination of computational and post-digital propaganda, before putting forward directions for future research and intervention approaches that target media literacy as well (pedagogically) safeguarding democratic values.

Keywords: Computational Propaganda, Post-Digital Techniques, Algorithms, Automation, Social Media, Fake News, Opinion Formation, Media Literacy, Democratic Governance

Introduction

Computational Propaganda and Post-Digital Propaganda:
Using algorithms, automation, and data analysis, computational propaganda seeks to shape public opinion, spread false information, and influence politician races through new media such as social networking sites. It involves various techniques including creating fake user accounts, posting misleading information, and even controlling online discussions in order to mold attitudes and patterns of thought. Academics have noted that computational propaganda has exaggerated political divisions, deeply infringed upon democratic practices, and posed challenges to the health of our information environment (Howard, 2018). Post-digital propaganda. The development and application of propaganda techniques in digital times, marked by a union of traditional propaganda strategy with emerging digital technologies and aesthetics; unlike regular propaganda which relies heavily on top-down information transfer and channels such as mass media to carry the message out to a wide area, post-digital propaganda utilizes participatory platforms, contents created by users, as well as immersive experiences in order to engage and impact audiences for oneself. With such a strategy, one aspect that needs to be considered is the integration of online and offline realities, and when we deliver persuasive stories to people on-line or off (Kücklich, 2019).

Evolution of Computational Propaganda:
Computational propaganda is an agenda that leverages algorithms, automation, and data analytics with the intention to manipulate the public, distribute misinformation and impact political and civic outcomes over digital platforms primarily, social media. As Howard and Woolley (2016) state, computational propaganda "=involves the use of algorithms, automation, and large-scale data mining to deliberately disseminate or amplify misleading information or disinformation, usually with a political purpose." This definition highlights how computational propaganda is not just incidental or opportunistic; it is a deliberate and strategic effort that seeks to exploit technological tools in order to shape narratives, control information flows, and influence public perceptions. The advancement of new types of technologies promoted the emergence of computational propaganda as a modern way of information spreading. Howard and Woolley (2016) define computational propaganda as the "manipulation of machines for political ends" or the "use of algorithms, automation and big data to intentionally promote and amplify misinformation or disinformation, often for political purposes." These techniques allow the actors to automate the spread of certain narratives or manipulate online discourse, amplifying messages and suppressing others. Advancements in technology in social media, artificial intelligence and data analytics have propelled the advancement of computational propaganda. These has introduced ways both to reach large audiences, target specific groups with messages tailored for them, and conceal the identity and motives of those behind the propaganda (Bradshaw

& Howard, 2018). Of course, the essence of computational propaganda simply involves automating the provision of information, allowing actors to do a lot more of what they have historically done (drowning out one message with more of another). Do this: use bots, fake accounts and targeted advertising to flood online discourse with what's essentially a fake-news blanket. The objectives often creates the illusion of widespread appeal or opposition to particular concepts, propagates trending topics or out-screams legitimate discourse (Bradshaw & Howard, 2018). The rise of computational propaganda has been inextricably linked to the evolution of digital technologies, and most notably so the changes in social media, artificial intelligence (AI) and data analytics. Such technologies have given propagandists potent means to reach wide audiences, target specific demographic groups and to mask their identities and intentions.

Early Stages: The Rise of Social Media (2000s):
The rise of new social media, especially Facebook, Twitter, and Youtube beginning in the early 2000s changed the manner in which information is shared and received. Such platforms provided users with unprecedented levels of access to information and the power to share content with wide-ranging audiences. But they also created fresh opportunities for manipulation, with propagandists realizing that the viral nature of social media could be weaponized to spread disinformation and sway public opinion. Computational propaganda itself was still rudimentary at this time, relying on basic automation tools such as spam bots and fake accounts to help amplify messages. Political actors have exploited bots to disseminate misinformation and shape online discussions, such as in the 2010 U.S. midterm elections (Woolley & Howard, 2016).

The Age of Big Data and Targeted Messaging (2010s):
The 2010s ushered in an era of big data analytics that allowed propagandists to gather and analyze massive quantities of user data to create iteration and targeted messaging campaigns. Innovations in technology: The second when social media created the parabola or bubble effect is based on algorithm-driven analytics used by social media channels to better represent their content to users, creating filter bubbles and echo chambers which reinforced these beliefs by excluding JSTOR Dissenting opinions (Pariser, 2011). During this time, more sophisticated automation tools developed, including AI-powered bots and deepfake technology that enabled propagandists to generate convincing fake content. Such as the Russian Internet Research Agency manipulating U.S. voters in 2016 presidential election through bots and fake accounts spread nonstop divisive content (Mueller, 2019).

The Era of Immersive Technologies and Post-Digital Propaganda (2020s):
Computational propaganda entered a new phase in the 2020s, merging with immersive technologies like augmented reality (AR) and virtual reality (VR). These technologies enable propagandists to produce extremely captivating and effective content that is hardly distinguishable from the online and offline realms. AR filters on social media platforms, for instance, can superimpose political messages on users photos, thereby carefully shaping their perceptions and attitudes (Bailenson, 2018). On top of that, advances in AI-generated content and deepfakes are making it harder and harder to discern between the authentic and the fabricated. Fake videos and audio recordings made with these technologies, have been used to spread misinformation and manipulate public opinion (Chesney & Citron, 2019).

Key Drivers of Evolution:
Several key factors have driven the evolution of computational propaganda:

1. **Technological Advancements:**

   Social media platforms have become the new loudspeakers—and propagandists have learned how to use them. The developments in AI and machine learning have led to the creation of sophisticated automation tools, such as bots and deepfakes that can produce and amplify content at scale. Big data analytics has also enabled propagandists to compose and disseminate very targeted messaging campaigns.

2. **Political and Social Factors:**

   The political polarization is rapidly growing among societies (internationally) therefore creating a good opportunity for the propagandists who can manipulate these already divided masses and can easily spread misinformation to gain control over public opinion. Authoritarian regimes and populist movements have been on the rise and thus weaponizing computational propaganda as a way to control and manipulate the political.

3. **Regulatory Gaps:**

   Such practices have thrived due to a lack of appropriate regulatory frameworks to deal with the issues presented by computational propaganda. Although several nations have passed legislation to tackle fake news and online manipulation, the challenge rests in law enforcement and many platforms still favor engagement over accountability (Flew et al., 2019).

Case Study: The Evolution of Computational Propaganda in Pakistan:
The socio-political context of Pakistan has undeniably influenced the development of computational propaganda in the country. The advent of social media platforms such as Facebook, Twitter and WhatsApp has provided political actors with potent tools to manipulate public opinion and shape political outcomes. In the 2018 general elections, we saw how political parties relied on bots and fake accounts to amplify their narratives and suppress dissent. As an illustration, the Pakistan Tehreek-e Insaf (PTP) party was

blamed for using automated accounts to disseminate pro-government material and defame opposition parties (Yousafzai, 2018). It was the rise of the COVID-19 pandemic that magnified the prophecies of computational propaganda as a tool of misinformation and an obstacle to public health efforts. (2021) reported that many false claims of vaccine side effects and home remedies for COVID-19 were propagated through WhatsApp, creating massive panic and confusion.

The Role of Algorithms, Automation, and Social Media Platforms

Algorithms and Social Media Manipulation:
Algorithms are at the heart of computational propaganda. They decide which content users are shown on social media sites. These algorithms are crafting recommendations to maximize engagement, sometimes boosting sensational or polarizing content in the process (Pasquale, 2015). The fact that these algorithms make content with these traits more visible and far-reaching creates opportunities for propagandists to hijack them.

Automation and Bots:
Bots and automated accounts are another big part of the mix. Bots may be designed to mine, produce, disseminate content, interacting with users and mimicking human engagement (Ferrara et al., 2016). Often, they give the appearance of broad support or opposition to particular ideas, skew trending topics or otherwise drown out legitimate discourse.

Fake news and social media platforms:
Facebook, Twitter and Instagram enable content to spread quickly, go viral and be targeted. Such platforms also offer resources for generating false accounts and avoiding detection, allowing propagandists to act behind a veil of anonymity (Zannettou et al., 2019).

Key Characteristics and Tactics Employed in Computational Propaganda Campaigns
They include a wide range of tactics and strategies aimed at manipulating public opinion, disseminating misinformation, and shaping political outcomes. These methods take advantage of the power of algorithms, automation and social media platforms to advance certain narratives while muting dissenting opinions or giving the appearance of broad support or opposition. What follows is an in-depth examination of the essential traits and strategies used in computational propaganda campaigns:

Disinformation and Misinformation:
Disinformation and misinformation are at the heart of computational propaganda. Disinformation is the intentional spread of false information in a way that dares to deceive misinformation is the spread of false information unintentionally. These tactics are employed by propagandists, who use them to try to bend the public's perception of reality and undermine credibility in institutions. Russian operatives manufactured false information on social media platforms during the 2016 U.S. presidential election regarding candidates, including phony news articles about Hillary Clinton's alleged health issues or corruption (Mueller, 2019). In Pakistan, fake news was widespread during the 2018 general elections when political parties circulated fake news about opposition leaders, including doctored images and videos, to discredit their opponents (Yousafzai, 2018).

Impact of Disinformation
Disinformation campaigns can result in serious ramifications, such as the erosion of public trust in democratic institutions, the escalation of political polarization, and the destabilization of societies. During the COVID-19 pandemic, misinformation about vaccines and treatments led to the erosion of public health (Wardle & Derakhshan, 2017).

Sock Puppets and Phony Accounts:
Sock puppets and fake accounts are online personalities set up by propagandists in order to spread propaganda, and coordinate inauthentic behavior. They are often designed to look like real users, so they can be hard to detect by either platforms or users. Sock puppets (deceptive accounts) generate content, interact with other users, and provide the impression of grassroots support for specific narratives or causes. In fact, fake accounts tend to be organized into larger networks, or botnets, that coordinate to push certain messages and skew trending topics (Stukal et al., 2017).

Case Study: Russian Troll Farms:
Thousands of fake accounts operated by the Russian Internet Research Agency (IRA) spread divisive content and strove to influence the 2016 U.S. presidential electorate. These accounts impersonated American citizens, posting inflammatory content intended to sow discord among American voters and reduce voter turnout (Mueller, 2019). Fake accounts erode the integrity of online discourse by drowning out legitimate voices and fostering the illusion of consensus. They also make it challenging for users to differentiate what is genuine and what is fake content leading to erosion of trust in social media sites.

Astroturfing:
Astroturfing is a method of simulating the effects of support for a cause or idea where none exists, or where efforts to generate enthusiasm are not organic, but rather automated or otherwise coordinated. Astroturfing campaigns, however, are devised by shadowy actors with particular interests in mind, rather than emerging organically from public interest, as true grassroots

movements do. A narrative or policy can be made to look like it is being widely supported by bots and fake accounts. They might even deploy paid advocates or fake reviews to further their agenda to make their position seem widely held (Zhang et al., 2018).

Case Study: Astroturfing in Pakistan:
Astroturfing Techniques Used by Political Parties in Pakistan. During 2018 Elections Through bots and fake accounts, social media platforms were inundated with pro-government content, while opposition voices were systematically quietened (Hussain, 2020). Astroturfing is a disingenuous strategy that seeks to distort public perceptions and create the illusion of consensus, undermining democratic processes. It also hinders policymaker ability to judge real stick vs carrot support for its initiatives, resulting in potentially miscalibrated decisions that do not reflect the needs and interests of the people.

Echo Chambers and Filter Bubbles:
Social media algorithms that favour content that aligns with users' beliefs, echo chambers and filter bubbles reinforce specific viewpoints, whilst excluding dissenting opinion. Computational propaganda leverages these biases to build extremely polarized information environments. Social media algorithms prioritize maximizing user engagement, which often entails presenting content that will elicit strong reactions, including sensationalist or polarizing content. As time goes on, users are subjected to more and more similar content until they become trapped in echo chambers in which their ideas are validated and no new perspectives are allowed (Pariser, 2011). Echo Chambers: This is precisely why echo chambers contribute to political polarization through isolation within information silos. They also make it easier for propagandists to spread lies, because users will be less likely to see posts that contradict what they believe.

Examining Polarization in Pakistan: A Case Study
And in Pakistan, echo chambers have made political polarization even worse, with supporters of opposing parties experiencing utterly different realities in the information they consume. As a result, there is a lack of common ground in public discourse between opposing sides (Yousafzai, 2018).

Amplification and Virality:
The ability to amplify and make content go viral are the key tactics that propagandists use to ensure their content spreads and hits a wide enough audience. It works by using automated accounts, manipulating timing, and coordinating shares. Bots and fake accounts amplify specific messages by retweeting, liking, or sharing content at scale. They can also 'hop on the train' of hashtag campaigns or trending topics that allow for their content to gain traction (Vosoughi et al., 2018). During the COVID-19 pandemic, myths regarding home remedies and vaccines side effects went viral on WhatsApp and caused a lot of panic and confusion in society. Automated accounts and coordinated sharing helped spread this misinformation at high speed (Khan, 2021). It should also be noted that amplification and virality has very real-world impacts: spreading panic, eroding trust in institutions, destabilizing societies, etc. They also enable most legitimate voices to be heard, as propagandists strangle dissenting opinions with their skewed noise. Through the dissemination of disinformation, the use of fictitious accounts, the establishment of echo chambers or the amplification of viral content, propagandists employ a myriad of techniques and strategies to sway public opinion and drive political outcomes. Solutions to these problems will need to be multi-pronged, involving technology and regulation, as well as teaching media literacy to promote transparency and accountability and counter manipulation.

Notable Cases of Computational Propaganda: Case Studies

Case Study 1: Russian Interference in the 2016 U.S. Presidential Election

The Russian Internet Research Agency (IRA) leveraged social media platforms to disseminate polarizing content and disinformation seeking to manipulate the election results (Mueller, 2019). The IRA used techniques like creating fake accounts, pushing divisive content, and targeting certain demographics with tailored content.

Case Study 2: The Brexit Referendum in the UK:
Research indicates that social media platforms were used to disseminate disinformation and promote polarizing content, and bots were responsible for a great deal of this (Howard & Kollanyi, 2016).

Case Study 3: Computational Propaganda or the 2018 Pakistan Elections
Bots and fake accounts were widely used by political parties during the 2018 general elections in Pakistan to spread narratives and shut down dissent. Such accounts have also been used for political purposes, such as spreading government propaganda, with the Pakistan Tehreek-e-Insaf (PTI) being accused of utilizing this tool(s) to promote their party viewpoint and vilify opposing ones (Yousafzai, 2018).

Case Study 4: COVID-19 Infodemic, Pakistan:
WhatsApp and Facebook were used to spread misinformation about COVID-19 during the COVID-19 pandemic, contributing to panic and confusion. Those falsehoods included popular home remedy and vaccine side effects misinformation circulated widely (Khan, 2021).

Beyond the Binary: Post-Digital Propaganda

It stands as significant advancement in the creation, dissemination, and consumption of propaganda. While traditional propaganda utilized one-directional information flow, mass media, and the broadcasting model, post-digital propaganda emerged as a more decentralized form of communication, operating on participatory platforms and through user-generated content and immersive technologies. Here, we move to the aesthetics and narratives of post-digital propaganda, the use of immersive technologies, the role of influencers and viral content in shaping public opinion.

A Definition of Post-Digital Propaganda:

Post-digital propaganda focusses on the convergence of traditional propaganda forms with new digital technologies and aesthetics. Because of its ability to imbue the line between online and offline realities, creating meaningful, immersive, and interactive experiences, this style screams contemporary digital culture.

Features of Post-Digital Propaganda:

Use of participatory platforms: The post-digital propaganda depends on user-generated content/output platforms, for example, social media, blogs, discussion boards. This is because this post-digital propaganda often takes the form of user-generated content rather than traditional top-down propaganda, so is more relatable and therefore persuasive. Through immersive experiences: Post-digital propaganda utilizes AR and VR to deliver highly engaging and interactive experiences that blur the line between reality and fiction (Kücklich, 2019). Such methods are limited compared to traditional propaganda, which is based on a unidirectional flow of information between a one-to-many paradigm: messages are sent from a central source to a passive public. Whereas digital propaganda is centralized and passive, where the users just consume the content, post-digital propaganda is interactive and decentralized, allowing users to be active in creating and disseminating content.

Towards Post-Digital Aesthetics and Narratives:

Post-digital propaganda often draws upon aesthetic elements and narratives that are aligned with contemporary digital culture. They are meant to interest people online and to create emotional ties that have the power to persuade readers. So, based on the above discussion, we can say memes are important in the context of post-digital propaganda as they inject humor, irony, pop-culture references into political messaging making them more relatable and familiar and easy to share in the digital networks. As an illustration, memes were utilized extensively in the 2020 U.S. presidential election to ridicule candidates, disseminate conspiracy theories, and rally supporters (Shifman, 2014). And, posts including viral videos and interactive media, like polls, quizzes and games are often the stuff of post-digital propaganda. These formats, as they require active participation, improve engagement and retention of information. For example, throughout the COVID-19 pandemic, viral videos spreading false cures or conspiracy theories became common on platforms such as YouTube and TikTok (Wardle & Derakhshan, 2017).

Case Study: Memes in Politics around Pakistan:

Memes in Pakistan have become a vehicle for political commentary and propaganda. In the elections of 2018, memes were used to lampoon Opposition leaders, highlight pro-government narratives, and galvanize young voters. The cleaver you know them are these often humorous political memes were an efficient tool to grab the attention of any online audience (Yousafzai, 2018).

Combining of Immersive Technologies

More advanced and engaging immersive technologies kat AR, VAK VR are applied in postdigital propaganda context. Propagandists can exploit these technologies to blur the distinction between truth and myth, making their message more compelling.

Augmented Reality (AR):

AR technology adds digital elements to the physical world, allowing interactive experiences that can be experienced on a smartphone or with AR glasses. Post-digital propaganda activist AR typically creates filters and lenses that overlay political messages or symbols on users' photos. Such as in the 2020 U.S. presidential election, AR filters were utilized as a medium to support candidates and motivate voters (Bailenson, 2018).

Virtual Reality (VR):

Virtual reality (VR) is a technology that provides immersive digital environments that users can explore using VR headsets. VR offers simulated experiences transmitting a strong emotional response, the kind of post-digital propaganda. For instance, VR, provides immersive documentaries focusing on social or political problems, to impact public beliefs (Kücklich, 2019).

Study: Political AR Filters in Campaigns:

In Pakistan, AR filters have been adopted by political parties to connect with the youth and private agendas. In the case of the 2023 elections, an example of the effective use of AR filters was the Pakistan Tehreek-e-Insaf (PTI) party in Pakistan, which provided its users with AR filters on Instagram to display party slogans and symbols on their photos to generate a sense of participation and loyalty among party members (Ali, 2023).

Role of Influencers and Viral Content:

This is because influencers have significant sway through their large followings that allow them to spread particular messages. This news is music to the ears of civil society actors who are now scrambling for evidence of fake news spread by influencers —

the ones who do not always use their fake identities (celebrities, social media personalities or even mere mortals with a lot of reach) for the purposes of propaganda (by political actors) that is usually packaged as authentic content.

How Influencers Operate:
This article shows how the influencers embed politics into their social media by propagating content that supports political actors. This content could be recommendations, testimonials, or personal accounts that resonate with their audience.

Case Study: Influencers in Pakistani Politics
In Pakistan, political parties have employed influencers to connect with Eschewing Traditional media. Youngest voters and shape popular attitudes and perception. Even, in the case of the 2018 elections, the PTI party worked with social media influencers to promote its agenda and mobilize support among young voters. So these influencers who produced content resting on the party's accomplishments and attacking the opposition, and they did so mainly through humor, using language their followers would get their heads around (Hussain, 2020). By sharing these propaganda messages, influencers can lend credibility to post-digital propaganda and help it reach a wider audience. Social Media Influencers are one of the most effective forms of PR strategy. Post-digital propaganda is an important movement in the production and distribution of propaganda as we know it. It crafts participatory platforms, user-generated materials, immersive experiences, and influencers to build compelling experiences aligned with a medium that transcends and yet embraces its predecessor the digital. This helps post-digital propaganda in engaging online audiences better and orchestrating public opinion. But they also point to significant ethical and regulatory challenges — especially when it comes to manipulating public opinion and undermining trust in digital platforms. Calibrating around these challenges will take a comprehensive social between technological solution, ruling infrastructure, and media literacy initiatives to engineer transparency, be answerable to, and resist manipulation.

Computational Post-Digital Techniques
Computational Propaganda and Post Digital Techniques. The Powerful Coincidence of Algorithmic Manipulation and Immersive Storytelling This combination allows propagandists to mount targeted, compelling, and effective campaigns to sway public opinion on a massive scale. And though it poses a great number of ethical challenges, not least of which is the ability to manipulate public opinion and the risk of being abused by authoritarian regimes or bad actors.

Computational Algorithms as Post-Digital Storytelling:
At the crossroads of computational propaganda and these post-digital techniques is the combination of algorithmic manipulation through immersive storytelling. This hybridization enables propagandists to wield the surgical specificity of data-fueled targeting along with the exacting power of interactive and emotionally charged content. The computational propaganda depends on algorithms to speed through all this information and spot trends in user action. As if called by Schoen's brand of snake oil -- these algorithms can ascertain what content users will be most likely to click on, enabling propagandists to craft messages for certain classes of people. For instance, algorithms personalized ads to swing voters, exploiting them based on their fears and biases, during the 2016 U.S. presidential election (Woolley & Howard, 2018).

Immersive Storytelling:
So, post-digital techniques boost the effectiveness of propaganda and create immersive experiences that connect with audiences emotionally. And utilizing augmented reality (AR), as well as virtual reality (VR), and interactive content to mix reality with fiction. Take, for instance, AR filters on social media sites, which can add political rhetoric to users' pictures, implicitly changing their views and beliefs (Bailenson, 2018).

Case Study: Targeted Propaganda in Pakistan:
Computational algorithms have also been used by political parties in Pakistan to identify and target specific demographic groups with tailored messaging. Using data analytics, the Pakistan Tehreek-e-Insaf (PTI) party, for example, identified a young base of potential voters, targeting them with pro-government content on social media platforms such as Facebook and Twitter (Naseer & Dhanani, 2018). Memes and viral videos, other post-digital techniques were used to gamify and virilize the content (Yousafzai, 2018).

Additive Effects on Amplification and Targeting:
Hence, this integration of computational and post-digital techniques creates more complex and powerful propaganda campaigns. With this precision of data-driven targeting and emotional resonance of immersive storytelling, propagandists can amplify their messages and ensure that they get to the right people.

Amplification via Automation:
Specific messages are supported via automation to ensure they flow through a social media outlet. This means deploying bots and automated accounts to retweet, like and share content at scale. This is not the first time automated accounts have been used to propagate polarizing content and manipulate trending topics, (Howard & Kollanyi, 2016) — they were used during the Brexit referendum, for example.

Data Analytics-Driven Targeting:
Computation propaganda can be made more potent through the principles of post-digital authoring: they leverage relations in their content (as we see here→), striving to see their messages in the sensibilities of their targets. This involves leveraging personalized content, dynamic experiences, and influencers to establish emotional attachments with users. For instance, in the COVID-19 pandemic, data analytics was used by propagandists to find vulnerable populations and can target these populations with misinformation about vaccines and treatments (Khan, 2021).

A Case in Point: Pakistan: Synergistic Campaigns
A variety of computational and post-digital techniques have been applied to effective propaganda campaigns in Pakistan. In the run-up to the 2023 elections, political parties employed data analytics to pinpoint swing voters, then create customized WhatsApp and Facebook ads to reach them. These ads were colorful and used post-digital techniques such as AR filters and viral videos to be more engaging and persuasive (Ali, 2023).

Ethical Considerations:
The integration of computational and post-digital methodologies poses major ethical implications, especially when it comes to the manipulation of public opinion, with risks of these techniques being commandeered by authoritarian, malicious, or terrorist organizations.

Manipulation of Public Opinion:
This allows for easier manipulation of public opinion in favor of propagandists as the combination of algorithmic targeting and immersive storytelling plays on cognitive biases and emotional vulnerabilities. One such example would be the Russian intervention in the 2016 US presidential election, where certain operatives launched targeted ads and fake news to bias voting and decrease trust in democratic institutions of the US (Mueller, 2019). Blood on the Populist Dance Floor: Zhu used to experiment with social media and its potential to forward messages that worked as potently as message-based propaganda, only to find these days that the proliferation of this form of computational and post-digital propaganda has eroded people's trust of social media platforms and other digital spaces. People have become more suspicious of what they see online, which makes it harder for real voices to be heard. The manner in which platforms manage propaganda and misinformation has consequently spurred demands for increased transparency and accountability (Zuboff, 2019).

Potential for Abuse by Authoritarian Regimes:

The combing of computational and post-digital methods provide brute tools for authoritarian regimes, to effectively control the public opinion and repress dissent. For instance, the Chinese government utilizes AI-driven surveillance and social credit systems to track and regulate the actions of its populace (Bradshaw & Howard, 2018).

The Social Work Practice: Case Study in Pakistan: Ethical Issues
Computational and post-digital propaganda in Pakistan has caused issues for the democracy and freedom of expression in the country. For instance, during the elections in 2018, political parties employed fake accounts and bots to disseminate disinformation and silence dissenting voices. Trend towards stronger regulatory frameworks to better tackle the ethical challenges presented by these practices (Rehman, 2025). Computational and Post-Digital Techniques The merger between computational and post-digital techniques produces an immensely strong form of algorithmically manipulated yet immersive storytelling. This enables propagandists to run highly targeted, engaging and persuasive campaigns the likes of which can sway public opinion like never before. But those advances are also hugely disturbing, especially when it comes to manipulating public opinion, eroding trust in digital platforms and enabling authoritarian governments. Tackling these problems will take a multi-faceted approach that includes technological solutions, regulatory frameworks, and media literacy initiatives to ensure transparency, accountability, and and resilience to manipulation.

Impact on Public Opinion Dynamics:
I mean, computational (and by extension, post-digital) propaganda reverberates through the structural stasis of public opinion formation. Propagandists are now developing sophisticated algorithms and utilizing immersive technologies in order to manipulate the information space, in efforts to shape the ways in which people perceive and interpret what has happened (Sunstein, 2017).

On Manipulating Cognitive Biases:
Confirmation bias and the availability heuristic are just some of the cognitive biases that propagandists take advantage of to steer public sentiment. By inundating the information ecosystem with content that confirms these biases, they can, with an illusion of consensus, polyphonic some places while ghostwriting others (Kahneman, 2011).

Polarization and Echo Chambers:
Political polarization (Hu 2014; Boulianne 2015), Political polarization is one of the major impacts of computational and post-digital propaganda. And propagandists can trap people in information silos in which echo chambers and filter bubbles are designed

to keep together similar ideas and isolate dissenting ones (Pariser, 2011). Today, we might call it computational and post-digital propaganda, but there is no longer any doubt of its impact on democratic processes and social coherence. These techniques can erode trust in institutions, distort public discourse, and destabilize democratic societies (Levitsky & Ziblatt, 2018) by undermining the integrity of information ecosystems.

Detecting and Mitigating Computational Propaganda: Strategies
A combination of technology and human oversight is necessary in order to detect, mitigate, and prevent computational propaganda. This includes creating algorithms to recognize and flag suspicious content and developing content moderation policies that emphasize transparency and accountability (Benkler et al., 2018). Finally, one of the most effective antidotes to propaganda is media literacy and critical thinking skills, so the use of such educational resources should be promoted as well. Teaching people how to critically evaluate information sources, recognize bias, and cross reference data are educational arms that can breed resilience to manipulation (McGrew et al., 2018).

Regulatory Frameworks:
However, it would require regulatory frameworks and policy interventions. Part of this includes the creation of laws & regulations that hold internet companies accountable for the nature of content hosted on their platform, like the laws that govern the tech companies that precede them, and/or the establishment of independent agencies that would monitor & enforce compliance (Flew et al., 2019). Fighting against propaganda poses important ethical dilemmas regarding the balance between protecting democratic processes and defending freedom of expression. However, in the pursuit of addressing such bad-faith efforts to manipulate public beliefs, we must also consider the need to ensure that we do not inadvertently deter legitimate discourse or violate individual rights (Balkin, 2018).

Future Directions and Conclusion
The methods of computational and post-digital propaganda will only get more sophisticated as technology progresses. However, new threats such as deepfakes, AI-generated content, and blockchain-based misinformation pose unique challenges for propaganda detection and mitigation (Chesney & Citron, 2019). How technology, propaganda, and the discussion between society will determine the future of opinion in the digital age. Computational and post-digital techniques will likely become more sophisticated (Tufekci, 2018) and increasingly play a pivotal role in shaping public opinion.

The Technological Impact of Computational Propaganda on Political Polarization and Social Fragmentation in Pakistan
The study provided sheds light on computer-controlled propaganda, which has far-reaching impact on political elation and social disruption in Pakistan. Foundation of Algorithmic Systems: This new type of propaganda, based on the integration of algorithms, automation and immersive technologies with the digital information ecosystem, is achieved through a series of technological infrastructures capable of quickly shaping public opinion and impacting political elections. This analysis summarizes the main findings of the research. It situates them against Pakistan's particular socio-political backdrop, zooming in on urban youth agency in this emergent paradigm.

Youth as Targets of Computational Propaganda:
In the Pakistan urban youth are most likely to be find victims of computational propaganda as they are most active user of social media forums. DRF (2022) conducted a study which revealed that 68% of young Pakistanis reported that they have faced fake news on social media, specifically WhatsApp and Facebook. The report noted that youth so do not possess the necessary critical media literacy skills to differentiate credible claims from manipulated information, leaving them vulnerable to propaganda campaigns. A PIDE study (2021) confirmed that much of the urban youth of the Pakistani population use social media for news and information, whereby PIDE explored that 75 percent of the population relied on social media as their primary source of news and information. As such, it is exposed to a nonstop stream of misinformation and disinformation via digital platforms, which is frequently magnified by bots and fake accounts. It also noted that young people were increasingly likely to share sensational material without checking on its authenticity, contributing to the cycle of computational propaganda. Focus group discussions carried out by the DRF in 2022 showed that a considerable number of young people are bewildered with the extensive amount of information available on social media and are unable to differentiate between credible and manipulated content. Another attendee in Lahore said, "It is hard to know what is real and what is fake. There are so many conflicting stories, and it's easy to get confused.' A second advocate from Karachi chimed in, "There is so much content on social media that is biased. Everybody is trying to get over on you, everybody is trying to use you. These perspectives highlight the challenges young people face as they navigate the digital information ecosystem and the calls for interventions to promote media literacy and critical thinking skills.

Effect on Political Polarization:
In fact, computational propaganda is already an established phenomenon, lies and misinformation designed for the specific purpose of reaching large amounts of the population and therefore influencing them, based on algorithms and automations to achieve its goals. In Pakistan, this has been reflected in the strategic use of social media platforms by political actors to sway election results and public conversation. For example, during the general elections of 2018, political parties (including PTI) were observed using bots and fake accounts to promote pro-government content and marginalize opposition opinions (Yousafzai, 2018). According to this view, the problem with political propaganda today is not that it exists, but the way in which it is disseminated — to the point that those with different political inclinations are made to consume very different sets of information, contributing to the

development of echo chambers or filter bubbles that enable the reinforcement of existing beliefs or a lack of exposure to alternate views. These tactics can be particularly effective with urban youth, who are some of the most active users on social media. This vulnerability, combined with their use of digital platforms for news and information, makes them easy prey for computational propaganda that capitalizes on their susceptibility to sensational and polarizing information. This has resulted in a fragmented political landscape, characterized by deepening party divisions among young constituents, creating barriers to' constructive dialogue and consensus-building.

1. **Social Fragmentation and the Role of Misinformation:**

In spreading misinformation and disinformation, computational propaganda fans group polarization, which also adds to social fragmentation, the research shows. This has been especially pronounced in Pakistan during crises' analogous to that of the COVID-19 pandemic, wherein misinformation regarding home therapies and adverse effects of vaccinations circulated extensively over platforms like WhatsApp, resulting in mass panic and confusion (Khan, 2021). As misinformation about the virus proliferated and took root, public health messaging was hindered and social rifts deepened, with various factions of society acting out differently, dependent on which information that they consumed. Urban youth are among the most active participants in online discourse and can be seen as both the contributors to and subjects of this trend. So on one hand, they are victims of computational propaganda where they are exposed to and manipulated by the content. They are also, however, perpetrators, and further to the extent that they share and amplify misinformation, frequently without understanding that misinformation begets misinformation within their networks. That dual role underscores the importance of demand-side as well as supply-side interventions against computational propaganda.

2. Post-Digital Propaganda and Immersive Technologies:

The research puts forth the idea of post-digital propaganda, a system where traditional propaganda practices merge with new emerging digital technology & aesthetic. In Pakistan, the use of immersive technologies like augmented (AR) and virtual reality (VR) in propaganda campaigns marks a new dimension for the manipulation of public opinion. This makes it a challenge for users to differentiate between real and fake information as these technologies produce exceptionally immersive and influential information that merges online with offline realities. This presents a big challenge for urban youth, who are typically the first to adopt new technologies. Post-digital propaganda consists of immersive content that creates a connection with its audience, through exploration of a shared experience or phenomenon, immersing the audience in that experience or phenomenon and thereby deeply appealing to emotions and senses in a way traditional propaganda simply cannot, thus leaving a stronger mark on perceptions and attitudes. As the lines between the real and the fake get increasingly blurred, this has implications for the future of political discourse in Pakistan.

3. Ethical and Regulatory Challenges:

The practices of computational propaganda were allowed to grow due to not having sufficient regulatory frameworks in place to counter these challenges. Although several countries have begun passing laws to address fake news and online manipulation, enforcement of such laws is patchy, and many platforms prioritize engagement over accountability (Flew et al., 2019). In Pakistan, where the pace of technology adoption has far outstripped the evolution of legal and ethical frameworks, this regulatory void is especially alarming. But given the scale of these challenges, it will require a multi-pronged approach, leveraging technological innovations, regulatory measures, and educational initiatives. To be more efficient and thus take the necessary initiatives, the governments need to develop advanced detection tools to detect and mitigate the spread of computational propaganda, which would help them take further steps such as legal law against networking following fake news or fake propaganda, it should also promote youth towards media literacy.

Conclusion

As the main user group of digital platforms, urban youth are both the most affected and the most resistant group to the manipulative tactics of computational propaganda. It will need techno-legal solutions and media literacy to combat vulnerable technology and media manipulators. Robust detection systems to detect and combat the diffusion of computational propaganda need to be developed and put into place. That includes using artificial intelligence and machine learning to detect bots, fake accounts and deepfakes. The effectiveness of these tools can be strengthened through collaboration among tech companies, academia, and civil society. Developing strong regulatory frameworks is vital to handling computational propaganda challenges. This could involve adopting legislation to counter fake news and online manipulation, requiring greater transparency regarding political advertisement placement, and increasing accountability for the content platforms engage in and host. It can also be key in fostering global standards and best practices. Browser are implemented with guide to example profile. By equipping young individuals with the tools to critically analyze information, fact-check, and behave ethically online, educational initiatives can be instrumental in enabling youth to navigate the digital information landscape responsibly. It can also help young people take agency to be responsible in shaping the digital future. Support for community deliberation and open discussion can help bring disparate individuals into conversation to reduce division and polarization. Programs encouraging dialogue across group lines, collaborative problem-solving, and civic engagement can help encourage a more unified society. Youth involvement in these initiatives can not only help them to become even more effective, but bring diverse voices to the discussion. Combatting computational propaganda in Pakistan: Conclusion While political polarization and social fragmentation remain endemic realities in Pakistan, the challenge of countering computational propaganda and its impact must be urgently laid on our policymaking agenda. Through technological solutions, regulatory frameworks, and educational initiatives, we can combat the threat of computational propaganda and prepare future generations to thrive in the digital information ecosystem. Pakistan can emerge stronger or fall deeper into the spiral of hatred, making the future of democracy and social cohesion dependent on how these issues are studied and understood.

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