



The Role of Computer Science: An Algorithm for Digital Vote in Indonesia

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Abstract: This paper explores the impact of digital technology on the profile of public participation in Indonesia. The digital era has triggered significant changes in the ways and patterns of public interaction with government structures and political structures. The great advancement of digital technology allows the synthesis of political participation that will be more inclusive of citizens. Citizens can easily actively disseminate political issues through existing social media platforms. This research uses descriptive research with a qualitative approach with a literature study approach. The data collection technique in this research is to conduct a literature search that is current and compatible with the research theme. The results of the study show that social media plays an important role in political participation in the digital era. Digital technology can also trigger opinion polarization. Political participation in the digital era has positive impacts and real challenges that must be addressed properly and wisely. Awareness of digital literacy and being critical are the main keys to maintaining inclusive political participation in this digital age.

Keywords: Algorithm; Computer science; Digital vote.

Introduction

The information society generated by existing of technological advances began to move to form virtual public spaces as a means of to represent their will and express their existence. The existence of new technologies invites us to rethink about democracy in the digital era digital (Laouris, 2015). The information society is an outcome of the digital revolution that continues to this day. The information society is often identified as post-industrial society, postmodern society, network society and most recently, or digital democracy (Hartanto, 2016).

The advent of digital technology has changed the way people interact with the government and affect the dynamics of politics (Ologunebi & Taiwo, 2025). The development of digital technology opens up new spaces that allow for more inclusive political participation and enables citizens to participate in the political decision-making process in an easier and faster way. Internet

utilization has become a crucial aspect of technological development, and the level of internet usage in various parts of Indonesia has increased significantly (Elizamiharti & Nelfira, 2023).



Figure 1. AI the Digital Intelligent Tools
Source: Google.com

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Social media allows citizens to share their opinions, mobilized support, and convey their political aspirations to political leaders and authoritative institutions. Through these digital tools, political participation has become more inclusive, allowing citizens from diverse backgrounds to have a voice and influence public decisions. The presence of social media platforms and information-sharing applications has also changed the dynamics of political campaigns. Political candidates and political parties can use digital platforms to build a support base, deliver political messages, and get feedback from citizens. Political campaigns that were previously limited to traditional media can now reach a wider audience and capitalize on the virality of social media.

However, along with opportunities, the digital age also poses serious challenges to democracy. With greater access to political information and political participation through digital platforms, challenges such as disinformation or the spread of false information that can influence citizens' political perceptions and decisions have become increasingly troubling. The spread of disinformation can confuse the public, reinforce polarization, and affect the integrity of critical and healthy political discussions. In addition, electoral manipulation is also a serious threat, where political actors or parties may utilize manipulation techniques, such as cyberattacks or influencing social media algorithms, to sway public opinion or gain an unfair advantage in elections (Elizamiharti & Nelfira, 2023).

Method

The type of research used in this study is descriptive research with a qualitative approach (Hantono et al., 2018). The data taken, identified in the following order: (1) data collection (2) data sorting (3) data analysis (4) conclusion making. As for data analysis, there is a predetermined sequence in accordance with the empirical steps taken, namely as follows: (1) Examination of data (2) suspected data findings, (3) Data confirmation (4) Diagnosis, (5) Action (Grieshaber, 2020).

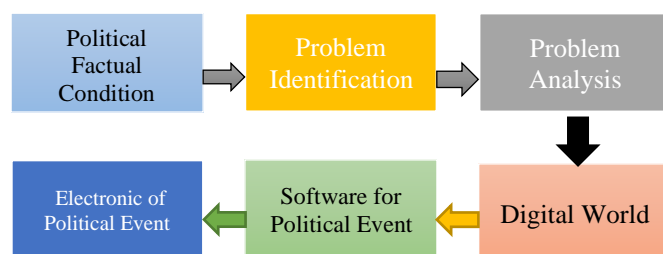


Figure 2. Flow of Logic

This research is qualitative research with a case study approach (Raco, 2018). The case study approach is a research strategy in which researchers carefully investigate a program, event, activity, process or group of individuals (Rianto, 2016). In case study research, the data collected comes from various sources and the results of the research only explain the case under study. Researchers chose this type of qualitative research because they wanted to analyzed more deeply the phenomenon of digital democracation.

Result and Discussion

The Digital Democracation

Since the 1970s, the world has experienced and felt the existence of a digital revolution where there is a change in electronic and mechanical technology towards higher technology, namely digital technology. The revolution in technology, characterized by the mass production and widespread use of computers, mobile phones, the internet and other devices, has led to changes in the pattern of relationships and social interactions between citizens, businesses and governments (Hartanto, 2016).

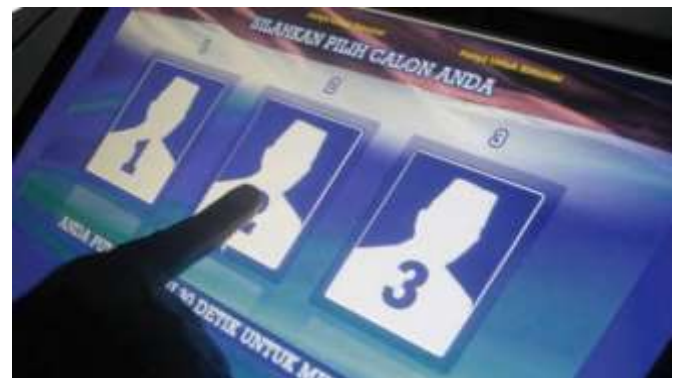


Figure 3. The Digital Vote Concept
Source: Google.com

The information society not only impacts new humanistic values but also the formation of a new level of democracy. Digital democracy becomes a leading system in the political, economic and socio-cultural context. Digital democracy becomes a framework within which the information society runs. Digital democracy displays a higher level than liberal democracy. Digital democracy gives rise to a symbiosis of electronic technology and the development of communication and information technology with people and the State. Digital democracy interacts people, groups of people, governments, businesses, local communities and social networks. Digital democracy is a dialectical interaction between society and technology (Castells, 1997).

Theoretically and practically, digital democracy explains how ICTs influence democracy and ongoing political processes. ICTs currently play a significant role in achieving a strong democracy based on community networks. A number of experts believe that ICTs are a potential factor to foster democratic development, and facilitate a quantum leap in the context of political democracy (Becker, 1998).

Political participation is the effort of citizens, both individuals and groups, to participate in influencing the formation of public policy in a country. There are various forms of political participation, including participating in elections, demonstrating on the streets, participating in political campaigns, and most recently uploading politically charged content to the Internet/social media (Carpini et al., 2004).

Information technology can increase the potential to participate in political debates, but in fact, net-citizens prefer to be consumers of information rather than producing information, discourse, political discourse. One of the impacts is the emergence of dis-information, fake news, hoaxes and even hate speech. This fact is partly driven by the low sensitivity of net citizens to the truth of information or news, lazy to do fact checking so that any information/news received is taken for granted and even disseminated to a wider circle of friends. Not to mention problems related to anonymity on the Internet (Zainal & Megasari, 2019).



Figure 4. Illustration of Digital Election
Source: Google.com

Communication with digital media intermediaries is indeed the main choice for the community, especially those related to political information or democracy. The communication process with digital media intermediaries begins with the process of creating information through video, news, or audio media that is transmitted using digital media with a minimum delay so that people can easily and quickly access various information on digital media.

Society now no longer acts as a recipient of information, but also as a producer of the information. From literature, we also found that there is a phenomenon of filter bubble effect or echo chamber effect in social media. Where social media users are trapped in an echo chamber that narrows their perspective, amidst the availability of so much and different information outside their own echo chamber. In the context of digital democracy, this phenomenon causes polarization of groups with different political views. This becomes a problem when in the echo chamber of these groups, hoaxes are spread. Based on the findings of previous research, most hoaxes are spread on social media. In the political realm, these hoaxes are used to attack political rivals because they have the potential to defame a person's image and credibility (Akbar et al., 2021).

The strong development of digital campaigns since the 2014 elections has made election organizers required to adapt quickly. For Bawaslu, the challenge lies in monitoring forms of election violations considering that the digital space as a new interaction space has great potential to give birth to forms of election violations (Haryanto et al., 2019).

One concrete form of adaptation was manifested through the formation of the Gowaslu application platform, which was initiated in 2016. The birth of the Gowaslu application platform was designed in an open manner characterized by the involvement of citizens who could report several types of election violations. The design of this platform was formed as a complaint media for citizens when they see election violations.

Citizens can actively participate in this platform as a form of substantive democracy, not only limited to voting during elections, but including participation in monitoring and reporting mechanisms through the Gowaslu application platform. This means that Gowaslu is a new space for citizens to be able to actively participate in assisting Bawaslu in its election monitoring function. The presence of the Gowaslu platform is also expected to make it easier for Bawaslu to carry out its duties and functions (Imawan, 2022).

Digitalization has changed the landscape of public participation in unprecedented ways. Digital communication technologies, such as social media, online platforms and online collaboration tools, have provided new platforms for citizens to have their voices heard and participate in public decisions (Aichholzer & Rose, 2020; Milakovich, 2012). This expanded participation promotes inclusivity, as individuals who previously did not have access or opportunity to participate in the political process are now able to contribute. An example is the use of social media as a means of political expression and social movement

organization. Political campaigners and community activists can use social media platforms to mobilize supporters, spread messages and build awareness about important issues. In addition, there are also online platforms that provide forums for direct public participation, such as online petitions and public opinion surveys. Thus, digitalization has provided opportunities for individuals to be actively involved in the political process, strengthening public participation in democracy (Fuchs, 2021; Hartiwiningsih, 2017).

Democracy mediated by digital constellations

Most contributions to the concept of digital democracy focus on the ongoing transformation of democratic governance (Stratu-Strelet et al., 2023). While some approaches centre on the de-institutionalization aspects of these changes, others are interested in experimental practices that can produce new or modified democratic institutions.

The first set of works tells stories of decline and instability. It includes observations on the growing fragility of once powerful political parties, the removal of elections and electoral bodies as core democratic institutions, and deep structural changes in the public sphere. The latter also concerns the eroding agenda-setting power of mass media in favours of more direct forms of political communication. According to this perspective, digital communication services have become a threat to the world's postwar democracies and, therefore, raise the question of whether and how democracy needs to be defended against the fragmentation and hybridization of the public sphere (Papacharissi, 2010), the increasingly unpredictable formation of political will, but also the normalization of hate speech, violence, and disinformation campaigns.

In contrast, narratives of democratic transformation portray digital democracy as an experimental setting for active reform of existing representative institutions. Digital resources for political action enable challenging democratic processes (Gauja, 2021; Miller & Vaccari, 2020), some of which can be translated into new institutional arrangements. Traditionally, law and legislators form the central political medium: law is the means by which citizens, through their parliamentary representatives, shape social order and social relations. More and more civic technology organizations are emerging around legislative functions with the aim to reform, improve or even replace them.

Platform parties aim to make organized political will formation more transparent and direct. NGOs such as European Digital Rights (EDRi) strive for more effective ways to hold political elites accountable. Social movements are also experimenting with direct forms of democratic decision-making that include developing

specialized infrastructures for bottom-up engagement at the local level, such as the "democracy-driven governance" digital platforms in Barcelona and Madrid.

Digital democracy is taking shape at a time when once-privileged forms of political action are in decline: political parties are suffering membership losses, the emancipatory aura of electoral suffrage is fading, and passive citizen audiences have evolved into active "prosumer" audiences. A rebalancing has taken place between the "two forces of democratic sovereignty", the public sphere as a space for discussion and the institutional decision-making space, where the former has gained relevance over the latter. At the "democratic interface" between institutionalized and non-institutionalized spaces of political action, we observe a spirit of change, explore new types of engagement and influence representative institutions. However, not all of these experiments qualify as emancipatory. Some of them test constitutional boundaries, are manipulative or anti-democratic, giving rise to an equally problematic "democracy defence industry".

Political participation is experiencing a shift from long-term involvement in political parties or associations towards issue-orientated, short-term, and temporary forms of action, described by Bennett and Segerberg as a transition from collective action to "connective action". However, the fragile and volatile nature of most digital movements suggests that political organisation is not becoming obsolete. "Platform parties", for example, aim to build horizontal membership structures and engagement platforms designed to make internal communication and decision-making more direct and transparent. Other political parties make their boundaries more permeable to recruit temporary support from non-members.

Social media, which has grown rapidly in recent years, seems to create a public sphere as a place for people to be able to play an active role in carrying out their political participation. The interactive nature of social media allows users to act more actively in a communication activity in the media, including in participatory political activities. Participatory politics can be carried out with a variety of activities, from pioneering ones such as forming online discussion forums, participating in spreading political content, to simply commenting on content or in a discussion forum (Karim et al., 2020).

Political culture is a psychological dimension that emphasizes individual orientation, political attitudes and symbols attached to an individual or collective. The author considers that the symbols attached to political institutions, either political parties or stakeholders, do not provide hope for the political culture. This is reinforced by the level of public trust in the performance

of policy makers, both legislative, political parties and government, which still does not satisfy the public will. So the resulting impact is that Gen-Z chooses to be apolitical and tends not to share political content (Karim et al., 2020).

Social media has an influence on the political participation of novice voters, especially social media through the use of information communication technology both electronically, print and online media. While conventional social media does not have a significant influence on beginner voters. Novice voters will be interested in politics while relaxing, although there is an influence of social media through schools and families, it does not have a significant effect because they are a generation that is familiar with the use of media. Thus, it can be stated that overall social media has an effect on voter political participation (Andriyendi & Dewi, 2023).

Conclusion

The use of social media in political campaigns can increase people's political participation. Social media provides an easily accessible and interactive platform for individuals to engage in political discussions, leading to increased political participation in forms such as sharing information, supporting candidates, and participating in elections. Social media plays an important role in shaping public perceptions of political issues and candidates. Through social media, political messages can quickly spread, influencing people's opinions and attitudes towards certain political issues. Social media also provides a space for citizens to share their views, which in turn shapes public opinion. The impact of using social media in political campaigns is not only positive, but also has some challenges. The spread of fake news or disinformation through social media can affect public perception and worsen the political climate. In addition, the existence of filter bubbles and echo chambers on social media can narrow people's access to different viewpoints, affecting the diversity of political views. The two-way communication enabled by social media provides an opportunity for political candidates to interact directly with voters. This can form a closer relationship between candidates and voters, increasing trust and political participation.

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Author Contributions

This study was conducted by me personally, so the content presented is my full responsibility. The single author provides a space for free expression so that the satisfaction of pouring thoughts can be accommodated.

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Conflicts of Interest

There is no interest conflict in this research. this research is conducted for scientific studies that are widely disseminated through this journal. Writings that are free of conflicts of interest will be disseminated without fear of the author, so that they can be free to continue working.

References

- Aichholzer, G., & Rose, G. (2020). Experience with digital tools in different types of e-participation. *European E-Democracy in Practice*, 93–140. Retrieved from <https://shorturl.asia/lihr6>
- Akbar, D., Susanti, P., Pangestu, Y. W., Iksan, Y., & Irwansyah. (2021). Industri Digital Dalam Dinamika Demokrasi Di Indonesia: Ancaman Atau Peluang? *Mediakom : Jurnal Ilmu Komunikasi*, 5(2), 138–148. <https://doi.org/10.35760/mkm.2021.v5i2.3775>
- Andriyendi, D., & Dewi, S. F. (2023). Media sosial dan pengaruhnya terhadap partisipasi politik pemilih pemula pada Pilkada. *Journal of Education, Cultural and Politics*, 101(1), 2798–6020. <https://doi.org/10.24036/jecco.v3i1.172>
- Becker, T. (1998). 'Governance and electronic innovation': A clash of paradigms. <https://doi.org/10.1080/13691189809358973>
- Carpini, M. X. D., Cook, F. L., & Jacobs, L. R. (2004). Public deliberation, discursive participation, and citizen engagement: A review of the empirical literature. *Annual Review of Political Science*, 7, 315–344. <https://doi.org/10.1146/annurev.polisci.7.121003.091630>
- Castells, M. (1997). *The Rise of the Network Society, volume 2: The Power of identity*. Oxford: Blackwell.
- Elizamiharti, E., & Nelfira, N. (2023). Demokrasi Di Era Digital: Tantangan Dan Peluang Dalam Partisipasi Politik. *Jurnal Riset Multidisiplin Dan Inovasi Teknologi*, 2(01), 61–72. <https://doi.org/10.59653/jimat.v2i01.342>
- 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). Retrieved from <https://www.westminsterpapers.org/article/id/917/>
- Gauja, A. (2021). Digital democracy: Big technology and the regulation of politics. *University of New South Wales Law Journal*, *The*, 44(3), 959-982. <https://doi.org/10.3316/informit.067538853247293>
- Grieshaber, S. (2020). Equity and research design. In *Doing early childhood research* (pp. 177-191). Routledge. <https://doi.org/10.4324/9781003115403-12>
- Hantono, D., Sidabutar, Y. F. D., & Hanafiah, U. I. M. (2018). Kajian Ruang Publik Kota Antara Aktivitas Dan Keterbatasan. *Langkau Betang: Jurnal Arsitektur*, 5(2), 80. <https://doi.org/10.26418/lantang.v5i2.29387>
- Hartanto. (2016). Demokrasi Digital Sebuah Tren Baru Globalisasi Sosial Budaya di Indonesia (Studi Kasus Penguatan Pesan Melalui Petisi Daring Change.org oleh Netizen di Indonesia. *Jurnal Ilmu Dan Budaya*, 40(51), 5851-5863. Retrieved from <http://journal.unas.ac.id/ilmu-budaya/article/view/261>
- Hartiwiningsih. (2017). *Peran Transformasi Digital dalam Meningkatkan Demokrasi yang berkepastian Hukum*. Mahkamah Konstitusi Republik Indonesia. Retrieved from <https://shorturl.asia/X405E>
- Haryanto, B., Ruldeviyani, Y., Rohman, F., TN, J. D., Magdalena, R., & Muhamad, Y. F. (2019). Facebook analysis of community sentiment on 2019 Indonesian presidential candidates from Facebook opinion data. *Procedia Computer Science*, 161, 715-722. <https://doi.org/10.1016/j.procs.2019.11.175>
- Imawan, A. P. (2022). Menata Demokrasi Digital Kesadaran Warga Negara dalam Upaya Menjaga Integritas Pemilu di Era Digital. *Jurnal Bawaslu Provinsi Kepulauan Riau*, 4, 109-120. Retrieved from <https://scholar.archive.org/work/wvhekfyup5f3rndjno7zj6wfre/access/wayback/https://journal.bawaslu.go.id/index.php/JBK/article/download/101/158>
- Karim, A. M., Wibawa, A., & Toko Arisanto, P. (2020). Partisipasi Politik Pemilih Pemula Di Media Sosial (Studi Deskriptif Tingkat Dan Pola Politik Partisipatif Gen-Z Kota Yogyakarta Melalui Pemanfaatan Aplikasi Instagram Tahun 2019. *Jurnal Ilmu Sosial Dan Ilmu Politik*, 3(2), 116-131. <https://doi.org/10.23969/paradigmapolistaat.v3i2.3093>
- Laouris, Y. (2015). Reengineering and Reinventing both Democracy and the Concept of Life in the Digital Era. *The Onlife Manifesto: Being Human in a Hyperconnected Era*, 125-142. Retrieved from <https://shorturl.asia/8PJYu>
- Milakovich, M. E. (2012). *Digital governance: New technologies for improving public service and participation*. Routledge. <https://doi.org/10.4324/9780203815991>
- Miller, M. L., & Vaccari, C. (2020). Digital threats to democracy: Comparative lessons and possible remedies. *The International Journal of Press/Politics*, 25(3), 333-356. <https://doi.org/10.1177/19401612209223>
- Ologunbe, J., & Taiwo, E. O. (2025). The Impact of Digital Communication on Governance, Political Dynamics, and Leadership; A Case Study of the Nigerian People and Process. *Political Dynamics, and Leadership*. <https://doi.org/10.2139/ssrn.5094521>
- Papacharissi, Z. (2010). *A private sphere: Democracy in a digital age*. Polity.
- Raco, J. (2018). *Metode penelitian kualitatif: jenis, karakteristik dan keunggulannya*. <https://doi.org/10.31219/osf.io/mfzuj>
- Rianto, P. (2016). *Modul Metode Penelitian*. Metode penelitian.
- Stratu-Strelet, D., Gil-Gómez, H., Oltra-Badenes, R., & Guerola-Navarro, V. (2023). Exploring the links between democracy and digital transformation in developing Latin America countries: Building a democracy consolidation theory. *Technological Forecasting and Social Change*, 195, 122742. <https://doi.org/10.1016/j.techfore.2023.122742>
- Zainal, F., & Megasari, N. F. (2019). Mempolitisasi Ruang Virtual: Posisi Warga-Net dalam Praktik Demokrasi Digital di Indonesia. *Jurnal Ilmiah Manajemen Publik Dan Kebijakan Sosial*, 306(1), 306-326. Retrieved from <https://shorturl.asia/6IwF0>