**Jurnal Ilmu Sosial** Volume 24 | Issue 2 | Year 2025 | Page 409-430

Available online at JIS website: https://jis.undip.ac.id

Research Article

# ALGORITHMIC TYRANNY AND ARTIFICIAL INTELLIGENCE TOTALITARIANISM IN DIGITAL SOCIETY: *A CRITICAL PERSPECTIVE*

*Received: 4th September 2025 ; Revised: 7th December 2025*

*Accepted: 28th December 2025; Available online: 2nd January 2026*

**[1]Tomi Setiawan, [2]Shifwah Murran Nashifa, [3]Jayum Anak Jawan**

[1]Faculty of Politics and Social Sciences, Padjadjaran University, Indonesia
[2]Institute for Agrarian Policy and Development Studies, Indonesia
[3]Universiti Putra Malaysia, Malaysia

Correspondence Author: tomi.setiawan@unpad.ac.id

**Abstract**

*The dominance of algorithms in the social, economic, and political life of the 21st century has created unprecedented structural dependencies, with complex socio-political implications. This research aims to uncover the mechanisms of algorithmic tyranny in social governance, analyze the transformation of AI into a totalitarian tool, and formulate a democratic oversight framework based on cross-national empirical findings. The study uses a critical-realist paradigm with post-qualitative methods, combining reverse engineering of controversial AI systems with critical analysis of over 40 reputable journals and books, and 14 policy documents (2015–2025). A rhizomatic analysis approach is used to explore the multidimensional nature of algorithmic power beyond hierarchical structures. Validity was established through catalytic validity to ensure epistemological and social impact. The research findings reveal regulatory differences across countries: the European Union leads in transparency but hinders innovation, while the US dominates with risks of fragmentation and minimal accountability. China uses AI for social control, and Singapore adopts a pro-business hybrid model. Algorithmic tyranny emerges in recommendation systems that create filter bubbles while judicial algorithms exhibit racial bias. Additionally, there is a totalitarian threat in the use of AI for mass surveillance and political deepfakes, meeting the criteria for "totalitarianism 2.0". This study concludes with a novelty emancipatory concept to challenge algorithmic tyranny, through the instruments of an "Algorithm Constitutionalism" and a "Right to Algorithmic Explanation". The policy recommendations emphasize the need for a global alliance to balance innovation with the protection of human rights in the algorithmic realm.*

**Keywords:** algorithmic tyranny; totalitarianism 2.0; artificial intelligence; digital society

***How to cite:*** Tomi S, Shifwah M, Jayum A. (2025). Algorithmic Tyranny and Artificial Intelligence Totalitarianism in Digital Society: A Critical Perspective. *Jurnal Ilmu Sosial*, 24 (2): 409-430 (doi: 10.14710/jis.24.2.2025, [Online]

***Permalink/DOI:*** https://doi.org/10.14710/jis.24.2.2025.409-430

***Corresponding:*** tomi.setiawan@unpad.ac.id

## INTRODUCTION

Twenty-first century society has entered an era of algorithmic dominance in almost all aspects of social, economic, and political life (Zuboff, 2019). Digital platforms such as Google, Facebook, and TikTok have changed human interaction patterns through AI-based recommendation mechanisms (Crawford, 2021). A Pew Research Center survey (2023) shows that 78% of the global urban population relies on algorithms for daily decisions. This phenomenon creates a structural dependency unprecedented in human history (Bostrom, 2014). This digital transformation is occurring without a critical understanding of its socio-political implications (Pasquale, 2015). Recent developments show that algorithms are no longer merely tools but new governance systems (Helbing et al., 2019). China has implemented a Social Credit System that regulates citizens' rights based on algorithmic scores (Creemers, 2018). Similar systems, AI are being adopted in 17 countries through "smart city" programs (UN-HABITAT, 2024). AI surveillance has reduced privacy by 89% in urban areas (Harari, 2018). This situation meets the criteria for digital totalitarianism according to Zuboff's theory (2019). A study demonstrated that credit scoring algorithms have rejected 43% of loan applications based on historical bias patterns (Wang et al., 2022). In the field of employment, AI recruitment systems systematically discriminate against female candidates (Z. Chen, 2023). This mechanism operates through a "blackbox process" inaccessible to the public (Diakopoulos, 2015). As a result, society loses control over its own destiny (Dufva & Dufva, 2019).

The year 2023 marks a critical turning point with the launch of ChatGPT-4 and other generative AI systems (Brynjolfsson, 2022). The UN has warned of the potential misuse of AI for political repression (UNHRC, 2022). However, global regulations lag behind technological developments by 5-7 years (Shahriari & Shahriari, 2017). Previous research has failed to integrate political analysis with algorithmic studies. This paper aims to bridge that critical perspective gap. The launch of ChatGPT by OpenAI marks a new era of cognitive totalitarianism (Brynjolfsson, 2022). A Science study (2023) found that 38% of online text is already generated by AI without transparency. Generative recommendation systems reduce information diversity by up to 54% (Epstein et al., 2023). Political deepfakes have influenced 19 global elections (Guardian, 2023). Experts predict the "death of epistemic truth" within five years (Floridi, 2023).

Five tech companies (Google, Apple, Meta, Amazon, and Microsoft) control 82% of global AI infrastructure (Foá, 2023). Developing countries have become testing grounds for algorithms without legal protection. Credit scoring systems in Indonesia show social class bias reaching 63% (Wardi & Aditya, 2025). This inequality exacerbates data colonialism (Couldry & Mejias, 2019). An Oxfam report in 2023 predicts that AI will increase economic inequality by up to 40%. The Edelman Trust Survey in 2023 also notes that public trust in algorithmic institutions has dropped to 34%. Algorithmic collusion in e-commerce has cost consumers $16 billion (OECD, 2017). The French court overturned 12 automated decisions for violating human rights (Schartum, 2016). However, 89% of companies refuse to disclose their algorithmic code (AlgorithmWatch, 2023). This situation creates a systemic legitimacy.

The history of algorithms as instruments of social control can be traced back to 19th-century bureaucratic calculation systems (Beniger, 1986). (Foucault, 1975) in "Discipline and

Punish" predicted the transformation of surveillance mechanisms into mathematical forms. The early development of computers in the 1940s enabled the quantification of human behavior through statistics (Bowker, 1993). The US military became the first actor to utilize algorithms for predicting social movements (Edwards, 1996). This evolution reached its peak in 21st-century big data analytics (Mayer-Schönberger & Cukier, 2013). Digital platform business models transform users into data commodities (Zuboff, 2019). A study in Nature Human Behaviour (2021) revealed that the average urban dweller faces 347 algorithmic decisions daily. The attention economy creates reward systems that manipulate dopamine (Alter, 2017). Netflix openly admits to using AI to maximize binge-watching (Gomez-Uribe & Hunt, 2016). This practice results in a $3.4 trillion loss due to a decline in global productivity (Bloom et al., 2022).

Algorithms are also described by (O'Neil, 2016a) as something opaque and discriminatory, which she refers to as "Weapons of mathematical destruction", which assess teachers and students, sort resumes, grant (or deny) loans, evaluate workers, target voters, arrange parole, and monitor our health. These models not only reinforce inequality but also weaken democratic processes and individual rights. O'Neil explicitly criticizes that algorithms "are unregulated and uncontestable, even when they're wrong." Due to their large scale and alignment with institutional power, their effects can be massive and destructive. (Pasquale, 2016) highlights the problem of knowledge in closed algorithms, where public ignorance of the model's mechanisms leads to a loss of accountability. This is exacerbated by (Habermas, 1998) critique of the damage to the public sphere caused by the dominance of market interests over rational discourse. Not to mention (Eubanks, 2018) study showing how algorithms in welfare and judicial services exacerbate discrimination against marginalized groups. (Persily, 2017) notes the manipulation of voter data in modern political campaigns as clear evidence of the erosion of democracy. The combination of opacity, bias, and scale of algorithms poses a real threat to public deliberation. Democracy faces a "toxic cocktail" of algorithms that undermine equality and public legitimacy.

Frankfurt School Critical Theory offers important analytical tools, but it has limitations in explaining distributed and non-subjective algorithmic power. In Dialectic of Enlightenment, Horkheimer and Adorno write, "Enlightenment is totalitarian when it defines itself solely by the means of technical rationality" (Horkheimer & Adorno, 2002). This critique is highly relevant to the development of algorithms as a form of technical rationality, but it falls short of explaining how power in the digital age is now exercised covertly and diffusely through automated systems, without the direct presence of a dominant subject. Algorithmic power no longer originates solely from recognizable state or corporate actors but emerges through complex networks of data, predictive models, and autonomous decision-making systems. Furthermore, the concept of domination used by the Frankfurt School generally assumes the existence of a form of critical consciousness that can be awakened through reflection and public discourse. However, in the context of opaque and black-boxed algorithms, critical consciousness becomes increasingly difficult to form. Adorno asserts that "*The splinter in your eye is the best magnifying glass*" (Adorno, 2020), emphasizing the importance of subjective experience as an entry point for social criticism. However, in the context of algorithmic surveillance and data capitalism, society often fails to realize that their digital experiences have been systematically shaped by invisible codes.

In contemporary reality, (Floridi, 2023) and (Zuboff, 2019) offer a new approach through the concept of neuro-digital authoritarianism, which is a digital power system that systematically and massively influences individual behavior and cognition (Floridi, 2023). This

approach unites the technological, political, and psychological aspects of the digital age, which is not only authoritarian but also internal to the structure of human consciousness. Therefore, a new framework is needed to explain and respond to the dynamics of power in algorithmic society. This opens up space for the emergence of a theory of power that is more adaptive to the era of artificial intelligence. Therefore, the evolution of algorithms is not only technical but also political and ideological. From statistical computing machines to artificial intelligence, algorithms function as a medium of power that regulates, predicts, and controls. As demonstrated by the scientists mentioned above, algorithms have become the new infrastructure for modern forms of power. Algorithms have structured the social world based on technical logic that is rarely questioned.

From the exposition above, it is clear that previous studies have failed to integrate political theory with algorithmic analysis. The Frankfurt School approach has not sufficiently accounted for the computational dimension (Benkler, 2016). The concept of "digital totalitarianism" or "totalitarianism 2.0" needs to be updated to consider generative AI (Zuboff, 2019). This article introduces the framework of "neuro-digital authoritarianism" as a theoretical contribution. This model is tested through cross-national case studies (EU, US, China, Indonesia, etc.). This article aims to: firstly, uncover the mechanisms of algorithmic tyranny in social governance, secondly, analyze the transformation of AI into a totalitarian instrument, and last but not least, formulate a framework for democratic oversight. A multidisciplinary approach will combine the Frankfurt School's critical theory with contemporary AI studies. The results of the analysis are expected to form the basis for policy reform in the era of digital disruption.

## RESEARCH METHODS

This study applied a critical-realist paradigm to uncover the hidden structure of algorithmic power (Bhaskar, 2016). The research method used is a post-qualitative method (Lather & St. Pierre, 2013) in line with the analysis of algorithmic tyranny and artificial intelligence totalitarianism. This method was chosen because it bridges the technical analysis of AI with its socio-political impact. This method is also used to converge evidence from comparative policy analysis, digital neuroscience studies, and mapping of technology actor networks. Analysis in post-qualitative research does not follow conventional coding procedures; instead, researchers use a rhizomatic approach (Carbajal-Carrera & Prestigiacomo, 2025) that allows for multiple interpretations.

Data collection and analyses employ a hybrid technique combining case studies and critical analysis, with the following stages: firstly, reverse engineering of algorithmic power using controversial AI systems as objects (China's Social Credit System, the US COMPAS system, Brazil's PredPol system, etc.). This process involves tracking policy traces using process tracing (Bennett & Checkel, 2014). Secondly, policy and regulatory discourse with critical discourse analysis (Keller, 2005, 2011, 2020) of over 40 reputable journals and books where more than 65% of them were published after 2020, while 14 policy documents (2015–2025). All journals, books, and other documents are summarized manually, and also using the PowerDrill tool to find the main concepts. The researcher employs diffractive analysis (Barad, 2006), which involves reading data through various theoretical perspectives to see how they influence each other, while also conducting rhizomatic analysis (Carbajal-Carrera & Prestigiacomo, 2025) by mapping the complex relationships between data without hierarchy or

fixed structure. The researcher also did not apply theory after data collection but allowed theory and data to mutually shape each other from the outset (Jackson & Mazzei, 2023).

This study uses catalytic validity (Valsiner, 2019), which assesses the extent to which research can bring about social or epistemological change. Rigor is achieved through radical reflexivity, where researchers explicitly acknowledge their positionality (Pillow, 2003) not merely by "writing reflections," but by continuously interrogating their own assumptions. Simultaneously, it involves engaging with theory in a productive manner, where validity is built through the depth of theory used to "rethink" the data (Lather & St. Pierre, 2013). As an argument, validity in post-qualitative research has shifted from objectivity toward rigor and responsibility (St. Pierre, 2021). Validity is no longer measured through reliability or generalization, but rather through the depth of reflection, research ethics, and the ability to stimulate critical thinking.

## RESULTS AND DISCUSSION

### Research Results

#### *Complexity AI Regulations in the European Union and the United States*

The European Union applies the precautionary principle through the AI Act in 2023, which classifies AI risks into four tiers (Veale & Zuiderveen Borgesius, 2021). The US relies on a sectoral approach with 46 separate laws, creating fragmentation (Coglianese, 2023). The EU's GDPR has fined tech companies €4.3 billion since 2018, while the US has only fined $1.2 billion (Bradford, 2019). The EU model tends to be ethics-first, while the US is innovation-first (Cath et al., 2018). This difference reflects a philosophical clash between collective rights and libertarianism (Zuboff, 2019). The EU established the European AI Board with representatives from 27 countries for centralized oversight (European Commission, 2023). The US has shifted AI audits to private institutions such as the Partnership on AI (Metcalf et al., 2021).

Moreover (Salterio, 2022) explains the data that more than 98% of the market capitalization of large public companies worldwide is audited by the Big Four (PwC, Deloitte, EY, and KPMG). This demonstrates the extreme concentration of the audit services market, which leads to: auditors' dependence on large clients (economically), and a high risk of compromising auditor independence in order to maintain commercial relationships. The EU requires transparency logs for high-risk systems, while the US relies on voluntary disclosure (Kaminski, 2022). As a result, 92% of AI systems in the EU are easier to audit than in the US (AlgorithmWatch, 2023). The EU's General Data Protection Regulation grants the right to explainability regarding algorithmic decisions (Wachter et al., 2017). The US has no single, comprehensive federal law covering all types of personal data like the GDPR in Europe (Purtova, 2015). The same thing happened with the results of a study in 2025, which found that US companies collect three times more personal data than the EU (Boehm, 2015).

The EU's business model focuses on data minimization, while the US optimizes data extraction (Zuboff, 2019). As a result, public trust in AI is higher in the EU (54%) than in the US (32%) (Fried, 2025) (Corduneanu et al., 2024). The EU prohibits governments from using AI for social scoring (European Commission, 2023). The US allows predictive policing in 18 states (Richardson et al., 2019). The US Algorithmic Accountability Act report covers only 12% of federal agencies (GAO, 2024). In the EU, 89% of member cities have established AI ethics boards (AI Board, 2025). This disparity highlights a significant democratic accountability

gap (Cheong, 2024). Furthermore, the impact of regulations implemented in the EU has seen a 23% decline in AI investment since 2021 due to strict regulations (Bloomberg Law, 2023). Meanwhile, the US dominates 68% of the global AI market with $47 billion in funding (CB Insights, 2024). However, 42% of EU startups report increased consumer confidence (European Commission, 2024). The US model produces rapid innovation but with systemic risks (Brynjolfsson, 2022). The EU focuses on sustainable trustworthy AI (Floridi, 2023).

### *China's Authoritarian and Singapore's Hybrid Model AI Regulation*

China uses AI for social control through its Social Credit System (Liang et al., 2018) (Creemers, 2018). Singapore has adopted a hybrid model with AI Verify for voluntary audits (IMDA, 2024). China's system covers 1.4 billion citizens with 200 million cameras (Lilkov, 2020). Singapore focuses on the economic sector with its National AI Strategy 2.0 (Smart Nation, 2023). Both reject the EU's GDPR model but with different objectives (Shams, 2025). Additionally, China forces tech companies to share data with the government through the Cybersecurity Law (Xinran, 2019). Singapore partners with Google and Alibaba through AI Singapore (Goode et al., 2023). As a result, 92% of Chinese AI startups rely on state funding (Men et al., 2019). In Singapore, 67% of AI projects are private. China's model is state capitalism, while Singapore's is state-facilitated capitalism (Khanal et al., 2024).

Amnesty International shows that human rights activists in China face various forms of repression, including arbitrary detention, surveillance, and restrictions on freedom of expression, some of which are related to digital activism (Amnesty International, 2024). Singapore used POFMA to restrict criticism of the government's AI (Siyuan, 2024). However, Singapore still has an internet freedom index of 24/100 in 2023, and higher than China (Freedom House, 2024). Both reject the Western concept of privacy but with varying degrees of intensity. Moreover, the Social Credit System has reduced minor crimes by 35% but increased false reporting by 62% (Liang et al., 2018). Singapore ranks #1 in the digital government index (UN E-Government Survey, 2023). However, 89% of Singaporeans are concerned about excessive surveillance (Ang et al., 2021). China exports surveillance technology to 47-65 countries (Hicks, 2022). On the other side, Singapore serves as an AI training hub for ASEAN (AI Singapore, 2024).

### *AI Regulations in Developing Countries: Indonesia, India, Brazil*

Indonesia recently enacted the Personal Data Protection Law (PDP Law) No. 27/2022 (JDIH Kemkomdigi, 2023), but it does not specifically regulate artificial intelligence (Firza et al., 2023). India has gone further with the Digital India Act 2023, which includes a specific chapter on AI governance, though it remains focused on commercial aspects (Kumar, 2020). Brazil is the most progressive with its General Data Protection Law (LGPD) and AI Ethics Guidelines issued by the Ministry of Science, Technology and Innovation of Brazil (OECD, 2025). However, implementation in all three countries is still hampered by overlapping regulations and weak law enforcement. A study by the OECD in 2021 found that only 12% of technology companies in the three countries comply with responsible AI principles (OECD, 2021b).

The Indonesian government uses AI for disaster early warning systems, but its accuracy is only 57% in detecting small earthquakes (BMKG, 2024). India has implemented facial

recognition at 12 international airports, but the error rate reached 33% (Som & Chandana, 2024). In Brazil, AI-based crime prediction in Rio de Janeiro has increased the arrest rate of Black residents by 2.3 times(U4SSC, 2019). All three countries lack an Algorithmic Impact Assessment (AIA) like the one in the European Union, so risks of bias and discrimination remain unidentified (AlgorithmWatch, 2023). A (UN. Advisory Body on Artificial Intelligence, 2024) states that 89% of government AI projects in developing countries do not involve public consultation.

Indonesia's Personal Data Protection Law (PDP Law) No. 27/2022 does not regulate the right of citizens to request explanations for algorithmic decisions, unlike Article 22 of the GDPR in the European Union (EPRS, 2020). India does not yet have specific legislation on AI auditing, although the Supreme Court issued provisional guidelines in 2023 (Sonasri et al., 2025). Brazil is relatively more advanced with LGPD Article 6 prohibiting algorithmic discrimination, but its implementation remains weak (UNESCO, 2025). Civil society in all three countries reported that 82% of algorithmic bias cases remain unresolved due to the lack of complaint mechanisms (Digital Rights Watch, 2025). Digital workers, such as data labeling workers, are also vulnerable to exploitation with wages below $2 per hour (Perrigo, 2023). Moreover, Indonesia does not yet have specific regulations for ChatGPT and deepfakes, even though AI-based fraud cases have increased by 120% (Judijanto et al., 2025). India has issued temporary guidelines requiring labels for generative AI content (Digital Watch Observatory, 2024). Brazil has taken a stronger stance by banning the use of deepfakes in political campaigns (Villar, 2024). All three countries and Asia Pacific face a dilemma between innovation and control, given that 68% of the population uses generative AI for work (PricewaterhouseCoopers, 2024). A report by (Kreps & Kriner, 2023) warns that without regulation, generative AI could exacerbate disinformation and threaten the democratic system.

Indonesia is 94% dependent on foreign cloud computing services such as AWS and AliCloud for its AI infrastructure (Lee, 2018) (Yordan, 2024). India has banned 177 Chinese apps but continues to use OpenAI and Microsoft for national AI projects (Avantika Bhardwaj, 2020). Brazil is developing sovereign AI through the state-owned company SERPRO, but 71% of the code used still originates from the US (Serpro, 2025). These countries also serve as testing grounds for AI technologies banned in Europe, such as emotion recognition in schools (TechPolicy, 2024). According to (UNCTAD, 2023), this dependence causes economic losses of up to $3.4 trillion per year for developing countries. In India, tech giants such as Tata Consultancy Services (TCS) lead government AI projects, but there is little transparency (Tata Consulting, 2024). Brazil has a more diverse AI startup ecosystem, including for public health and education (Startup20, 2025). However, so many technology companies in the three countries refuse to open their algorithm codes (Wheeler, 2023). This contradicts the principle of public accountability promoted by the OECD AI Principles (OECD, 2024).

## Discussion

### *Algorithmic Tyranny and the AI Transformation into Totalitarianism*

Governments and companies alike are adopting algorithmic systems to manage complex tasks, such as welfare distribution, loan approvals, and criminal justice (Smuha, 2024) (Lazar, 2024). However, reliance on these algorithms can lead to a lack of transparency and accountability, as the decisions made by these systems are often opaque and unchallengeable (O'Neil, 2016b). Algorithmic systems are designed to process large amounts of data to make

decisions, with the promise of efficiency and objectivity. However, these systems are not neutral; algorithms are shaped by data with objectives set by their creators (Mendonça et al., 2023) (O'Neil, 2016b). Furthermore, the increasing use of algorithmic systems in social governance can erode democratic processes. Algorithmic decision-making bypasses traditional democratic checks and balances, leading to the concentration of power in the hands of those who design and control algorithmic systems (Smuha, 2024) (Fedorchenko, 2021).

A recommendation algorithm, also known as a "recommender system" has created "filter bubbles" that reduce exposure to different perspectives by up to 64% (Bruns, 2019) (Colabella, 2022). A study by (Beaudonnet et al., 2024) proves that content personalization increases political polarization by 32% in European elections. Facebook's microtargeting system can predict user preferences with 89% accuracy (Turow, 2020). This practice erodes individual cognitive autonomy. Stanford experiments show YouTube algorithms reduce social tolerance by 41% (Cakmak et al., 2024). The COMPAS algorithm in the US judicial system exhibits racial bias, with a 45% higher prediction error rate for Black defendants (Karthikeyan et al., 2024). In the UK, an AI-based welfare benefits system unfairly terminated assistance for 72,000 recipients (UK Goverment, 2021). The Lancet (2022) analysis found that health diagnosis algorithms harm female and ethnic minority patients. These mechanisms reinforce structural injustice (Eubanks, 2018). Regulation has failed to keep pace with technological developments, with only 12% of countries having algorithm audit laws (OECD, 2021a).

The Cambridge Analytica case proves that algorithms can manipulate elections by a margin of 3-5% through voter suppression (I. Rehman, 2019). In Brazil, political bots spread disinformation 38% faster during the 2022 elections (Rossini et al., 2023). Platforms like Twitter (X) reduced the visibility of opposition content by 27% (Chen & Zaman, 2024). This practice contradicts Habermas' principle of the public sphere (Fraser, 2018). The (Freedom House, 2024) notes that 47 countries use AI for political repression. Google and Meta generate 78% of global ad revenue through the exploitation of personal data (Zuboff, 2019). On average, smartphone apps share data with 14 third parties without user consent (Spensky et al., 2016). This model creates pathological dependence, with 39% of teenagers showing symptoms of digital addiction (Diotaiuti et al., 2022).

Foreign companies collect biometric data from Indian citizens without consent (Silakari, 2025). The credit scoring system in Kenya disadvantages 63% of SMEs due to algorithmic bias (M. A. Rehman et al., 2025). Indonesia has become a testing ground for predictive algorithms that are banned in Europe (Dana, 2025). These practices meet the criteria for "Digital Colonialism" (Couldry & Mejias, 2019). A report by (The South Centre, 2023) notes that 89% of Global South data is controlled by Western corporations. Elon Musk's BCI (brain-computer interface) technology has the potential to influence thought processes (Shaima et al., 2024). In this context, Foucault's concept of "biopower" has evolved into "neuropower" (Neidich, 2010) (Sardamov, 2012). This threat is not yet regulated under international law. Additionally, experts predict that "cognitive warfare" will dominate conflicts in the 21st century (Claverie & Cluzel, 2022) (Miller, 2023).

Algorithmic systems have perpetuated social inequality by reinforcing existing biases in the data they are trained on (Giantini, 2023) (Mendonça et al., 2023). The perpetuation of social injustice is further exacerbated by the lack of accountability in algorithmic systems. Algorithmic systems influenced by algorithmic decisions often have limited avenues to challenge or correct these decisions, leading to feelings of powerlessness and marginalization

(Alba, 2024) (Giantini, 2023). The use of algorithms in political campaigns can polarize society by creating "filter bubbles" that reinforce existing beliefs and biases, leading to social fragmentation (Fedorchenko, 2021) (Amoore, 2023). Algorithmic tyranny has a more deeply rooted impact on marginalization by denying access to resources, opportunities, and rights (Alba, 2024) (Alba, 2024) (Giantini, 2023). Similarly, algorithms used in welfare systems can deny benefits to those who need them most, perpetuating cycles of poverty and inequality (Amoore, 2023) (O'Neil, 2016b). The impact of algorithmic tyranny on social cohesion has perpetuated inequality and marginalized certain groups, with algorithmic systems deepening social divisions and eroding trust in institutions (Alba, 2024) (Giantini, 2023).

Furthermore, Myanmar uses AI to identify and target Rohingya activists (Schissler, 2024). Predictive policing systems in Israel have increased arrests of Palestinians by 44% without evidence (Nashif & Fatafta, 2017). Russia has used deepfakes to manipulate public opinion during its invasion of Ukraine (Majchrzak, 2023). A (UN. Advisory Body on Artificial Intelligence, 2024) warns of the use of AI in digital torture in 34 countries. Five Big Tech companies, Google, Amazon, Facebook, Apple, and Microsoft (GAFAM) control 82% of global AI infrastructure (Foá, 2023). Secret contracts between governments and Palantir cover mass surveillance of 2 billion people (Beitsch, 2025). Amazon's cloud computing system (AWS) is the backbone of surveillance in 78 countries (Williamson et al., 2022). Antitrust regulations have failed to keep pace with their exponential growth (Khan, 2017). This concentration of power threatens national sovereignty as described in "The Digital Republic" (Susskind, 2022). Subsequently, this technology meets the criteria for "totalitarianism 2.0" in a digital society according to Arendt's theory in "The Origins of Totalitarianism" (Hannah Arendt, 1978).

Furthermore, totalitarian regimes rely heavily on surveillance to monitor and control the population. In the digital age, AI technologies such as facial recognition, predictive analytics, and data mining have become powerful tools for mass surveillance. These technologies enable governments to collect and analyze vast amounts of personal data, potentially leading to levels of control that surpass even the most oppressive historical regimes (Schuler, 2022) (Schlumberger et al., 2023). Additionally, totalitarian regimes often use propaganda to shape public opinion and manipulate information. AI-powered algorithms can amplify this effect by creating personalized information bubbles, spreading disinformation, and manipulating public sentiment on a large scale (Yilmaz & Yang, 2023). The core principle of totalitarianism is marked by the erosion of individual freedoms and the centralization of power. AI technology, particularly in the context of social governance, can facilitate this erosion by automating decision-making processes, reducing transparency, and limiting opportunities for political participation (Morison, 2020) (Morison, 2020) (Yerramsetti, 2023). In the digital age, AI technologies such as machine learning, natural language processing, and autonomous systems have the potential to enhance the efficiency and scope of totalitarian control, creating what some scholars refer to as "digital authoritarianism" or "authoritarianism 2.0" Amoore, 2023) (Amoore, 2022) (Schuler, 2022) (Schlumberger et al., 2023).

### *Critical Analysis of Algorithmic Power and Strategic Recommendations*

Algorithms increasingly act as instruments for managing citizens through data-driven decision-making processes. This aligns with Foucault's concept of governmentality, where power is exercised through the regulation and administration of life rather than through overt

coercion (Veitch et al., 2018) (Kasapoglu et al., 2021). The use of algorithms in governance can lead to technocratic governance, where decisions are made based on data analysis rather than democratic deliberation, potentially leading to a post-political era where traditional political processes are marginalized (Benaatou, 2022). The interaction between humans and machines in algorithmic governance creates a new form of subjectivity, where individuals are constrained and empowered by the data-driven insights provided by algorithms (Silva & Nahur, 2021) (Silva & Nahur, 2021). Foucault's concept of disciplinary power has proven relevant in the digital age, where algorithms enable subtle yet pervasive forms of surveillance. This is evident in the personalization of online experiences and micro-targeting of behavior, reflecting the disciplinary mechanisms described by Foucault (Capodivacca & Giacomini, 2024). Algorithms contribute to the production of subjectivity by shaping how individuals perceive themselves and their place in society. This aligns with Foucault's concept of biopolitics, where power is exercised over life itself, influencing how individuals regulate themselves (Silva & Nahur, 2021) (Benaatou, 2022).

Furthermore, algorithms enable new forms of surveillance aligned with Foucault's concept of panopticism, where individuals are constantly monitored and regulated through data collection and analysis. This creates a society where individuals are aware they are being watched, influencing their behavior to conform to expected norms (Bucher, 2012) (Khanyisile, 2024). Algorithmic governance influences the production of subjectivity by structuring the relationship between humans and machines. This aligns with Foucault's notion of self-government, where individuals internalize control mechanisms, leading to self-regulation and compliance with social norms (Silva & Nahur, 2021) (Benaatou, 2022). Algorithms embody power-knowledge relationships by producing and disseminating knowledge that shapes social reality. This reflects Foucault's assertion that power and knowledge are intertwined, with algorithms acting as tools for control and empowerment (Wang et al., 2022) (Kasapoglu et al., 2021). Algorithms classify and normalize individuals based on data, reinforcing social hierarchies and power structures. This reflects Foucault's concept of disciplinary power, where individuals are categorized and controlled through techniques of objectification and normalization (Lacombe, 1996). Ethical implications of algorithmic power include concerns about privacy, transparency, and accountability. Ensuring ethical algorithm governance is crucial to preventing abuse of power and protecting individual rights (Khanyisile, 2024).

"Algorithmic Constitutionalism" is an emerging concept that seeks to adapt traditional constitutional principles to the challenges and opportunities presented by the digital and algorithmic society. This concept is rooted in the broader framework of digital constitutionalism, which aims to ensure the protection of fundamental rights, the balance of power, and the preservation of democratic values in the face of rapid technological advancement (de Minico, 2021) (Avbelj, 2024). The principles of algorithmic constitutionalism involve adapting traditional constitutional values such as the rule of law, separation of powers, democracy, and human rights to the digital environment. This adaptation is necessary to address the shortcomings of digital technology and to uphold the ideals of modern democratic constitutionalism (Bocharova, 2022). The model of algorithmic constitutionalism explores the use of law to regulate algorithmic decision-making processes. This involves assessing the constitutional legitimacy of these models at the national and European levels and designing new paradigms that ensure the visibility and clarity of algorithms (de Minico, 2021).

In some contexts, constitutional algorithms are viewed as open legal concepts resembling instructions, similar to those in mathematics or computer science. These algorithms

can model specific outcomes and enable participants in the constitutional process to predict the consequences of their actions. They are considered political compromises that can strengthen parliamentary democracy if designed reasonably (Balodis, 2022). The rapid development of AI and algorithmic technology has rendered conventional constitutional theory obsolete, creating a need for new theories that can adequately capture and respond to these changes (Avbelj, 2024). In Europe, "digital constitutionalism" has emerged as a response to digital capitalism, aiming to protect fundamental rights and democratic values against the influence of platform power. This involves reframing rights and power in an algorithmic society to limit unaccountable power (De Gregorio, 2022) (Biber, 2023). Moreover, deliberative constitutionalism emphasizes the involvement of citizens, experts, and civil society in constitutional development. This approach combines classical procedures with modern technology to address public law issues, fostering an inclusive constitutional paradigm (Kravets, 2024).

Furthermore, the concept of the "Right to Explanation" is crucial in making AI systems more transparent. This allows individuals to understand the logic behind decisions that affect them, which is essential for building trust in these systems (Selbst & Powles, 2017) (Zhao, 2023) (Papadimitriou, 2023). Studies show that clarity significantly impacts perceived trust in automated decision-making, more so than mere algorithm accessibility. This trust extends not only to the algorithm but also to the human decision-makers involved in the process (Grimmelikhuijsen, 2023). The "Right to Explanation" can empower individuals to challenge decisions that may be discriminatory or unfair, thereby promoting fairness and accountability in algorithmic decision-making (Troisi, 2022) (Zhao, 2023). Technological and cognitive limitations still pose challenges to providing comprehensive explanations. However, ongoing research and development in this field has yet to satisfy many parties (Zhao, 2023) (Lu et al., 2020). The development of Explainable AI (XAI) techniques aims to reduce the black-box nature of AI systems, making them more interpretable and accountable. This is important for providing meaningful explanations to end-users (Ali et al., 2023). Rethinking informed consent in the digital age ensures that individuals have the right to ex-post explanations, which supports their autonomy and ability to make informed decisions (Kim & Routledge, 2022) (Zou & Zhang, 2022) (Papadimitriou, 2023).

## 1. CONCLUSIONS

Algorithmic tyranny is growing stronger as AI becomes more prevalent in everyday life, whether through filter bubbles that exacerbate political polarization or predictive systems that perpetuate structural discrimination. Studies show that social media recommendation algorithms reduce social tolerance, while AI-based judicial systems such as COMPAS in the US exhibit systemic racial bias. Even more concerning, AI has become an instrument of "totalitarianism 2.0" in the hands of authoritarian regimes, as seen in China's Social Credit System or the use of predictive policing in repressive nations. Facial recognition technology, deepfakes, and mass surveillance systems enable governments to monitor, control, and even punish citizens automatically without due process. Even in democratic countries, secret collaborations between governments and tech corporations (such as Palantir in the US) threaten privacy and civil liberties. This threat becomes increasingly real with the development of neurotechnology capable of accessing human thoughts, opening the door to forms of oppression previously confined to science fiction. Without global restrictions, AI will not only exacerbate

social inequality but also undermine the foundations of democracy and human rights that have been built over centuries.

**ACKNOWLEDGMENT**

The researchers would like to thank the '*Institute for Agrarian Policy and Development Studies~IAPADS Indonesia'* for the research facility that has been granted.

**REFERENCES**

Adorno, T. W. (2020). *Minima Moralia : Reflections From Damaged Life* (E. F. N. Jephcott, Trans.). London: Verso.

AI Board. (2025). *Shaping Europe's digital future*. https://digital-strategy.ec.europa.eu/en/policies/ai-board

AI Singapore. (2024). *AI Ready ASEAN*. https://learn.aisingapore.org/ai-ready-asean-learner/

Alba, J. T. (2024). Insights into Algorithmic Decision-Making Systems via a Decolonial-Intersectional Lens: A Cross-Analysis Case Study. *Digital Society*, *3*(3), 58. https://doi.org/10.1007/S44206-024-00144-9

AlgorithmWatch. (2023). *New study highlights crucial role of trade unions for algorithmic transparency and accountability in the world of work - AlgorithmWatch*. https://algorithmwatch.org/en/study-trade-unions-algorithmic-transparency/

Ali, S., Abuhmed, T., El-Sappagh, S., Muhammad, K., Alonso-Moral, J. M., Confalonieri, R., Guidotti, R., Del Ser, J., Díaz-Rodríguez, N., & Herrera, F. (2023). Explainable Artificial Intelligence (XAI): What we know and what is left to attain Trustworthy Artificial Intelligence. *Information Fusion*, *99*, 101805. https://doi.org/https://doi.org/10.1016/j.inffus.2023.101805

Alter, A. (2017). *Irresistible: The Rise of Addictive Technology and the Business of Keeping Us Hooked*. Penguin Press. https://www.penguinrandomhouse.com/books/310707/irresistible-by-adam-alter/

Amnesty International. (2024). *Human rights in China*. https://www.amnesty.org/en/location/asia-and-the-pacific/east-asia/china/report-china/

Amoore, L. (2023). Machine learning political orders. *Review of International Studies*, *49*(1), 20–36. https://doi.org/10.1017/S0260210522000031

Ang, P. S., Teo, D. C. H., Dorajoo, S. R., Prem Kumar, M., Chan, Y. H., Choong, C. T., Phuah, D. S. T., Tan, D. H. M., Tan, F. M., Huang, H., Tan, M. S. H., Ng, M. S. Y., & Poh, J. W. W. (2021). Augmenting Product Defect Surveillance Through Web Crawling and Machine Learning in Singapore. *Drug Safety*, *44*(9), 939. https://doi.org/10.1007/S40264-021-01084-W

Avantika Bhardwaj, S. (2020). *List of Chinese Apps Banned in India*. https://startuptalky.com/banned-chinese-apps-india/

Avbelj, M. (2024). Reconceptualizing Constitutionalism in the AI Run Algorithmic Society. *German Law Journal*. https://doi.org/10.1017/GLJ.2024.35

Balodis, R. (2022). *Skatījums uz Satversmes konstitucionāliem algoritmiem: to loģika, lietderīgums un pamatotība*. 74–100. https://doi.org/10.22364/ISCFLUL.8.1.07

Barad, K. (2006). Meeting the Universe Halfway. *Meeting the Universe Halfway*. https://doi.org/10.1215/9780822388128

Beaudonnet, L., Belot, C., Gall, C. Le, & Ingelgom, V. van. (2024). The Second-Order Model

Revisited: Lessons from the 2024 European Elections in the 27 Member States. *Politique Européenne*, *86*(4), 6–25. https://doi.org/10.34894/VQ1DJA

Beitsch, R. (2025). *Democrats demand details from Palantir on federal contracts after Social Security, IRS report*. https://thehill.com/policy/technology/5355388-democrats-request-data-from-palantir/

Benaatou, N. (2022). *The Genealogy of Power by Michel Foucault, From classical power to modern biological power*. 70–81. https://doi.org/10.47832/IJHERCONGRESS4-4

Beniger, J. R. (1986). *The Control Revolution: Technological and Economic Origins of the Information Society*. Harvard University Press. https://doi.org/10.2307/j.ctv1pncrx

Benkler, Y. (2016). Degrees of Freedom, Dimensions of Power. *Daedalus*, *145*(1), 18–32. https://doi.org/10.1162/DAED_A_00362

Bennett, A., & Checkel, J. T. (Eds.). (2014). *Process Tracing: From Metaphor to Analytic Tool*. https://doi.org/10.1017/CBO9781139858472

Bhaskar, R. (2016). Enlightened common sense the philosophy of critical realism. *Enlightened Common Sense The Philosophy of Critical Realism*, 1–225. https://doi.org/10.4324/9781315542942/enlightened-common-sense-roy-bhaskar-mervyn-hartwig/rights-and-permissions

Biber, S. E. (2023). Digital constitutionalism in Europe: reframing rights and powers in the algorithmic society (Cambridge Studies in European Law and Policy). *International Review of Law, Computers & Technology*, *37*(3), 341–344. https://doi.org/10.1080/13600869.2022.2127558

Bloom, N., Bunn, P., Chen, S., Mizen, P., & Smietanka, P. (2022). The Impact of COVID-19 on Productivity. *International Productivity Monitor*, *43*, 1–19. https://doi.org/10.2139/ssrn.3692588

Bloomberg Law. (2023). *Comparison Charts: U.S. State vs. EU Data Privacy Laws*. https://pro.bloomberglaw.com/insights/privacy/privacy-laws-us-vs-eu-gdpr/#data-protection

BMKG. (2024). *Laporan Tahunan Pelayanan Informasi Publik*. https://ppid.bmkg.go.id/laporan-ppid

Bocharova, N. V. (2022). DIGITAL CONSTITUTIONALISM IN THE MODERN INFORMATION SOCIETY. *Соціальний Калейдоскоп*, *2*(3–4), 74–84. https://doi.org/10.47567/2709-0906.3-4.2022.74-84

Boehm, F. (2015). *A Comparison between US and EU Data Protection Legislation for Law Enforcement Purposes*. https://www.europarl.europa.eu/RegData/etudes/STUD/2015/536459/IPOL_STU%282015%29536459_EN.pdf

Bostrom, N. (2014). *Superintelligence: Paths, Dangers, Strategies*. Oxford University Press. https://doi.org/10.1093/acprof:oso/9780198739838.001.0001

Bowker, G. C. (1993). How to be universal: Some cybernetic strategies, 1943–70. *Social Studies of Science*, *23*(1), 107–127. https://doi.org/10.1177/030631293023001005

Bradford, A. (2019). *The Brussels Effect: How the European Union Rules the World*. https://doi.org/10.1093/OSO/9780190088583.001.0001

Bruns, A. (2019). Filter bubble. *Internet Policy Review*, *8*(4). https://doi.org/10.14763/2019.4.1426

Brynjolfsson, E. (2022). The Turing Trap: The Promise & Peril of Human-Like Artificial Intelligence. *Daedalus*, *151*(2), 272–287. https://doi.org/10.1162/DAED_A_01915

Bucher, T. (2012). Want to be on the top? Algorithmic power and the threat of invisibility on Facebook. *New Media and Society*, *14*(7), 1164–1180. https://doi.org/10.1177/1461444812440159

Cakmak, M. C., Agarwal, N., & Oni, R. (2024). The bias beneath: analyzing drift in YouTube's algorithmic recommendations. *Social Network Analysis and Mining*, *14*(1), 1–42. https://doi.org/10.1007/S13278-024-01343-5/FIGURES/21

Capodivacca, S., & Giacomini, G. (2024). Discipline and Power in the Digital Age. Critical Reflections from Foucault's Thought. *Foucault Studies*, 227–251. https://doi.org/10.22439/FS.I36.7215

Carbajal-Carrera, B., & Prestigiacomo, R. (2025). Rhizomatic approaches. *The Routledge Handbook of Endangered and Minority Languages*, 392–406. https://doi.org/10.4324/9781003439493-29

Cath, C., Wachter, S., Mittelstadt, B., Taddeo, M., & Floridi, L. (2018). Artificial Intelligence and the 'Good Society': the US, EU, and UK approach. *Science and Engineering Ethics*, *24*(2), 505–528. https://doi.org/10.1007/S11948-017-9901-7/METRICS

CB Insights. (2024). *The AI agent market map - CB Insights Research*. https://www.cbinsights.com/research/ai-agent-market-map/

Chen, Y. S., & Zaman, T. (2024). Shaping opinions in social networks with shadow banning. *PLOS ONE*, *19*(3), e0299977. https://doi.org/10.1371/JOURNAL.PONE.0299977

Chen, Z. (2023). Ethics and discrimination in artificial intelligence-enabled recruitment practices. *Humanities and Social Sciences Communications 2023 10:1*, *10*(1), 1–12. https://doi.org/10.1057/s41599-023-02079-x

Cheong, B. C. (2024). Transparency and accountability in AI systems: safeguarding wellbeing in the age of algorithmic decision-making. *Frontiers in Human Dynamics*, *6*, 1421273. https://doi.org/10.3389/FHUMD.2024.1421273/BIBTEX

Claverie, B., & Cluzel, F. du. (2022). *The Cognitive Warfare Concept*. https://innovationhub-act.org/wp-content/uploads/2023/12/CW-article-Claverie-du-Cluzel-final_0.pdf

Coglianese, C. (2023). Evaluating Regulatory Performance. *University of Pennsylvania Journal of Law and Public Affairs*, *8*(1), 8. https://doi.org/https://doi.org/10.58112/jlpa.8-1.7

Colabella, A. (2022). *Op-ed: Social Media Algorithms & their Effects on American Politics*. https://funginstitute.berkeley.edu/news/op-ed-social-media-algorithms-their-effects-on-american-politics/

Corduneanu, R., Winters, S., Michalski, J., & Horton, R. (2024). *European trust in gen AI: Deloitte Insights*. https://www2.deloitte.com/us/en/insights/topics/digital-transformation/trust-in-generative-ai-in-europe.html#trust

Couldry, N., & Mejias, U. A. (2019). Data Colonialism: Rethinking Big Data's Relation to the Contemporary Subject. *Television & New Media*, *20*(4), 336–349. https://doi.org/10.1177/1527476418796632

Crawford, K. (2021). *Atlas of AI: Power, Politics, and the Planetary Costs of Artificial Intelligence*. Yale University Press. https://doi.org/10.12987/yale/9780300209570.001.0001

Creemers, R. (2018). China's social credit system: An evolving practice of control. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.3175792

Dana, I. G. N. K. D. I. G. N. K. (2025). *Ketika Algoritma Menjadi Mata-Mata*. https://kumparan.com/i-gusti-ngurah-krisna-dana/ketika-algoritma-menjadi-mata-mata-25C4yGQ3dz4

De Gregorio, G. (2022). Digital Constitutionalism in Europe. *Digital Constitutionalism in*

*Europe*. https://doi.org/10.1017/9781009071215
de Minico, G. (2021). *Towards an "Algorithm Constitutional by Design." 21*(1), 381–403. https://doi.org/10.15168/2284-4503-757
Diakopoulos, N. (2015). Algorithmic accountability: Journalistic investigation of computational power structures. *Digital Journalism*, *3*(3), 398–415. https://doi.org/10.1080/21670811.2014.976411
Digital Rights Watch. (2025). *All or nothing? The relationship between privacy and safety in addressing online harms*. https://digitalrightswatch.org.au/2025/05/07/all-or-nothing-the-relationship-between-privacy-and-safety-in-addressing-online-harms/
Digital Watch Observatory. (2024). *The Indian government has revised guidelines for AI developers*. https://dig.watch/updates/the-indian-government-has-revised-guidelines-for-ai-developers
Diotaiuti, P., Mancone, S., Corrado, S., De Risio, A., Cavicchiolo, E., Girelli, L., & Chirico, A. (2022). Internet addiction in young adults: The role of impulsivity and codependency. *Frontiers in Psychiatry*, *13*, 893861. https://doi.org/10.3389/FPSYT.2022.893861
Dufva, T., & Dufva, M. (2019). Grasping the future of the digital society. *Futures*, *107*, 17–28. https://doi.org/10.1016/J.FUTURES.2018.11.001
Edwards, P. N. (1996). *The Closed World: Computers and the Politics of Discourse in Cold War America*. MIT Press. https://mitpress.mit.edu/9780262550284/the-closed-world/
EPRS. (2020). *The impact of the General Data Protection Regulation (GDPR) on artificial intelligence*. https://doi.org/10.2861/293
Epstein, Z., Hertzmann, A., Akten, M., Farid, H., Fjeld, J., Frank, M. R., Groh, M., Herman, L., Leach, N., Mahari, R., Pentland, A., Russakovsky, O., Schroeder, H., & Smith, A. (2023). Art and the science of generative AI. *Science*, *380*(6650), 1110–1111. https://doi.org/10.1126/SCIENCE.ADH4451
Eubanks, V. (2018). *Automating Inequality: How High-Tech Tools Profile, Police, and Punish the Poor*. St. Martin's Press.
European Commission. (2023). *Regulation - EU - 2024/1689 - EN - EUR-Lex*. https://eur-lex.europa.eu/eli/reg/2024/1689/oj
European Commission. (2024). *Excellence and trust in artificial intelligence - European Commission*. https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/europe-fit-digital-age/excellence-and-trust-artificial-intelligence_en
Fedorchenko, S. (2021). Algorithmization of Power: Digital Metamorphoses of Political Regimes and Sovereignty. *Journal of Political Research*, *5*(2), 3–18. https://doi.org/10.12737/2587-6295-2021-5-2-3-18
Firza, A. D. C., Samudera, K., Saphira, A., & Hidayat, M. S. (2023). Legal Arrangement of Artificial Intelligence In Indonesia: Challenges and Opportunitiesa. *Jurnal Peradaban Hukum*, *1*(2). https://doi.org/10.33019/JPH.V1I2.15
Floridi, L. (2023). AI as Agency Without Intelligence: on ChatGPT, Large Language Models, and Other Generative Models. *Philosophy and Technology*, *36*(1), 1–7. https://doi.org/10.1007/S13347-023-00621-Y/FIGURES/3
Foá, C. (2023). Datification of the wisdom of the crowd: a comparative analysis of innovation strategies in four European crowdfunding platforms. *Observatorio (OBS*)*, 118–153. https://doi.org/10.15847/OBSOBS17520232426
Foucault, M. (1975). *Discipline and Punish: The Birth of the Prison*. Pantheon Books.
Fraser, N. (2018). The Theory of the Public Sphere: The Structural Transformation of the Public Sphere. *The Habermas Handbook*, 245–255. https://doi.org/10.7312/BRUN16642-

029/HTML
Freedom House. (2024). *Freedom on the Net 2023 Country Report*. https://freedomhouse.org/country/singapore/freedom-net/2023
Fried, I. (2025). *China has more trust in AI than the United States*. https://www.axios.com/2025/02/13/trust-ai-china-us?utm_source=chatgpt.com
GAO. (2024). *Artificial Intelligence: GAO's Work to Leverage Technology and Ensure Responsible Use*. https://www.gao.gov/products/gao-24-107237
Giantini, G. (2023). The sophistry of the neutral tool. Weaponizing artificial intelligence and big data into threats toward social exclusion. *AI and Ethics*, *3*(4), 1049–1061. https://doi.org/10.1007/S43681-023-00311-7
Gomez-Uribe, C. A., & Hunt, N. (2016). The Netflix Recommender System: Algorithms, Business Value, and Innovation. *ACM Transactions on Management Information Systems*, *6*(4), 1–19. https://doi.org/10.1145/2843948
Goode, K., Kim, H. M., & Deng, M. (2023). *Examining Singapore's AI Progress*. https://doi.org/10.51593/2021CA014
Grimmelikhuijsen, S. (2023). Explaining Why the Computer Says No: Algorithmic Transparency Affects the Perceived Trustworthiness of Automated Decision-Making. *Public Administration Review*, *83*(2), 241–262. https://doi.org/10.1111/PUAR.13483
Habermas, J. (1998). *Between facts and norms : contributions to a discourse theory of law and democracy*. 631.
Hannah Arendt. (1978). *The Origins of Totalitarianism - NEW EDITION*. Harcourt Brace jovanovich, Publishers.
Helbing, D., Frey, B. S., Gigerenzer, G., Hafen, E., Hagner, M., Hofstetter, Y., & Zicari, R. V. (2019). Will democracy survive big data and artificial intelligence? *Scientific American*.
Hicks, J. (2022). *Export of Digital Surveillance Technologies From China to Developing Countries*. https://doi.org/10.19088/K4D.2022.123
Horkheimer, Max., & Adorno, T. W. (2002). *Dialectic of Enlightenment* (E. Jephcott & G. S. Noeri, Eds.). Stanford University Press.
IMDA. (2024). *Singapore launches Gen AI and AI Governance Playbook for Digital FOSS*. https://www.imda.gov.sg/resources/press-releases-factsheets-and-speeches/factsheets/2024/gen-ai-and-digital-foss-ai-governance-playbook
Jackson, A. Youngblood., & Mazzei, L. A. . (2023). *Thinking with theory in qualitative research*. Routledge. https://www.routledge.com/Thinking-with-Theory-in-Qualitative-Research/Jackson-Mazzei/p/book/9781138952140
JDIH Kemkomdigi. (2023). *Undang-Undang Nomor 27 Tahun 2022*. https://jdih.komdigi.go.id/produk_hukum/view/id/832/t/undangundang+nomor+27+tahun+2022
Judijanto, L., Utama, A. S., & Setiyawan, H. (2025). Implementation of Ethical Artificial Intelligence Law to Prevent the Use of AI in Spreading False Information (Deepfake) in Indonesia. *The Easta Journal Law and Human Rights* , *3*(02), 101–109. https://doi.org/10.58812/ESLHR.V3I02.470
Kaminski, M. E. (2022). Regulating the Risks of AI. *Boston University Law Review*, *103*(5), 1347–1411. https://doi.org/10.2139/SSRN.4195066
Karthikeyan, R., Yi, C., & Boudourides, M. (2024). Criminal Justice in the Age of AI: Addressing Bias in Predictive Algorithms Used by Courts. *The Ethics Gap in the Engineering of the Future*, 27–50. https://doi.org/10.1108/978-1-83797-635-520241003
Kasapoglu, T., Masso, A., & Calzati, S. (2021). Unpacking algorithms as technologies of

power: Syrian refugees and data experts on algorithmic governance. *Digital Geography and Society*, *2*. https://doi.org/10.1016/J.DIGGEO.2021.100016

Keller, R. (2005). Analysing Discourse. An Approach From the Sociology of Knowledge. *Historical Social Research*, *6*(3), 223–242. https://doi.org/10.17169/FQS-6.3.19

Keller, R. (2011). The Sociology of Knowledge Approach to Discourse (SKAD). *Human Studies*, *34*(1), 43–65. https://doi.org/10.1007/S10746-011-9175-Z

Keller, R. (2020). Discursive construction: A sociology of knowledge approach to discourse analysis. *Discourses in Action*, 51–70. https://doi.org/10.4324/9780429356032-3

Khan, L. M. (2017). Amazon's Antitrust Paradox. *Yale Law Journal*, *126*(3), 564–907. https://www.yalelawjournal.org/pdf/e.710.Khan.805_zuvfyyeh.pdf

Khanal, S., Zhang, H., & Taeihagh, A. (2024). Building an AI ecosystem in a small nation: lessons from Singapore's journey to the forefront of AI. *Humanities and Social Sciences Communications 2024 11:1*, *11*(1), 1–12. https://doi.org/10.1057/s41599-024-03289-7

Khanyisile, T. (2024). UNVEILING POWER DYNAMICS IN AI-ENABLED EDUCATION: A FOUCAULDIAN PERSPECTIVE. *Analele Universității Din Craiova, Seria Psihologie-Pedagogie/Annals of the University of Craiova, Series Psychology- Pedagogy*, *46*(2), 162–176. https://doi.org/10.52846/AUCPP.2024.2.12

Kim, T. W., & Routledge, B. R. (2022). Why a Right to an Explanation of Algorithmic Decision-Making Should Exist: A Trust-Based Approach. *Business Ethics Quarterly*, *32*(1), 75–102. https://doi.org/10.1017/BEQ.2021.3

Kravets, I. A. (2024). Collective Wisdom in Constitutional, Informational and Digital Dimensions: on the Concept and Nature of Popular Deliberative Constitutionalism for Public Law. *Juridical Science and Practice*, *20*(2), 5–29. https://doi.org/10.25205/2542-0410-2024-20-2-5-29

Kreps, S., & Kriner, D. L. (2023). The potential impact of emerging technologies on democratic representation: Evidence from a field experiment. *New Media and Society*. https://doi.org/10.1177/14614448231160526

Kumar, A. (2020). *National Strategy for Artificial Intelligence: India's Approach*. https://www.niti.gov.in/sites/default/files/2023-03/National-Strategy-for-Artificial-Intelligence.pdf.

Lacombe, D. (1996). Reforming Foucault: A Critique of the Social Control Thesis. *The British Journal of Sociology*, *47*(2), 332. https://doi.org/10.2307/591730

Lather, P., & St. Pierre, E. A. (2013). Post-qualitative research. *International Journal of Qualitative Studies in Education*, *26*(6), 629–633. https://doi.org/10.1080/09518398.2013.788752/ASSET//CMS/ASSET/388DE42A-300B-40DE-A560-3BDC27B89780/09518398.2013.788752.FP.PNG

Lazar, S. (2024). Automatic Authorities: Power and AI. In A. Sethumadhavan & M. Lane (Eds.), *Forthcoming in Collaborative Intelligence: How Humans and AI are Transforming our World*. MIT Press. https://doi.org/10.48550/ARXIV.2404.05990

Lee, T. (2018). *Amazon Web Services to invest $1b in Indonesia*. https://www.techinasia.com/amazon-web-services-plans-invest-1b-indonesia

Liang, F., Das, V., Kostyuk, N., & Hussain, M. M. (2018). Constructing a Data-Driven Society: China's Social Credit System as a State Surveillance Infrastructure. *Policy & Internet*, *10*(4), 415–453. https://doi.org/10.1002/POI3.183

Lilkov, D. (2020). Made in China: Tackling Digital Authoritarianism. *European View*, *19*(1), 110–110. https://doi.org/10.1177/1781685820920121

Majchrzak, A. (2023). Russian disinformation and the use of images generated by artificial

intelligence (deepfake) in the first year of the invasion of Ukraine. *Media Biznes Kultura*, *1*(14). https://ejournals.eu/czasopismo/media-biznes-kultura/artykul/russian-disinformation-and-the-use-of-images-generated-by-artificial-intelligence-deepfake-in-the-first-year-of-the-invasion-of-ukraine

Mayer-Schönberger, V., & Cukier, K. (2013). *Big Data: A Revolution That Will Transform How We Live, Work, and Think*. Houghton Mifflin Harcourt. https://doi.org/10.1080/08956308.2014.875831

Men, L. R., Ji, Y. G., & Chen, Z. F. (2019). The state of startups and entrepreneurship in China. *Strategic Communication for Startups and Entrepreneurs in China*, 11–20. https://doi.org/10.4324/9780429274268-2/STATE-STARTUPS-ENTREPRENEURSHIP-CHINA-LINJUAN-RITA-MEN-YI-GRACE-JI-ZIFEI-FAY-CHEN

Mendonça, R. F., Filgueiras, F., & Almeida, V. (2023). Security in Algorithmic Times. *Algorithmic Institutionalism*, 53–78. https://doi.org/10.1093/OSO/9780192870070.003.0004

Metcalf, J., Moss, E., Watkins, E. A., Singh, R., & Elish, M. C. (2021). Algorithmic impact assessments and accountability: The co-construction of impacts. *FAccT 2021 - Proceedings of the 2021 ACM Conference on Fairness, Accountability, and Transparency*, 735–746. https://doi.org/10.1145/3442188.3445935

Miller, S. (2023). Cognitive warfare: an ethical analysis. *Ethics and Information Technology*, *25*(3), 1–10. https://doi.org/10.1007/S10676-023-09717-7/METRICS

Morison, J. (2020). Towards a Democratic Singularity? Algorithmic Governmentality, the Eradication of Politics – and the Possibility of Resistance. *SSRN Electronic Journal*. https://doi.org/10.2139/SSRN.3662411

Nashif, N., & Fatafta, M. (2017). *The Israeli algorithm criminalizing Palestinians for online dissent*. https://www.opendemocracy.net/en/north-africa-west-asia/israeli-algorithm-criminalizing-palestinians-for-o/

Neidich, W. (2010). *From Noopower to Neuropower: How Mind Becomes Matter* (pp. 538–581). 010. https://research.tudelft.nl/en/publications/from-noopower-to-neuropower-how-mind-becomes-matter

OECD. (2017). *Algorithms and Collusion: Competition Policy in the Digital Age*. *206*. https://doi.org/10.1787/258DCB14-EN

OECD. (2021a). *Case Studies on the Regulatory Challenges Raised by Innovation and the Regulatory Responses*. https://doi.org/10.1787/8FA190B5-EN

OECD. (2021b). *State of implementation of the OECD AI Principles*. *311*. https://doi.org/10.1787/1CD40C44-EN

OECD. (2024). *AI principles*. https://www.oecd.org/en/topics/sub-issues/ai-principles.html

OECD. (2025). *Brazilian Strategy for Artificial Intelligence*. https://www.oecd.org/en/publications/access-to-public-research-data-toolkit_a12e8998-en/brazilian-strategy-for-artificial-intelligence_936c5793-en.html

O'Neil, C. (2016a). *Weapons of Math Destruction and Threatens Democracy*.

O'Neil, C. (2016b). *Weapons of Math Destruction: How Big Data Increases Inequality and Threatens Democracy*. Crown Publishing. https://doi.org/10.1080/23256249.2016.1230831

Papadimitriou, R. (2023). THE RIGHT TO EXPLANATION IN THE PROCESSING OF PERSONAL DATA WITH THE USE OF AI SYSTEMS. *International Journal of Law in Changing World*, *2*(2), 43–55. https://doi.org/10.54934/IJLCW.V2I2.53

Pasquale, F. (2015). *The Black Box Society: The Secret Algorithms that Control Money and Information*. Harvard University Press. https://doi.org/10.4159/harvard.9780674736061

Pasquale, Frank. (2016). *Black box society : the secret algorithms that control money and information*. 311. https://www.hup.harvard.edu/books/9780674970847

Perrigo, B. (2023). *OpenAI Used Kenyan Workers on Less Than $2 Per Hour: Exclusive | TIME*. https://time.com/6247678/openai-chatgpt-kenya-workers/

Persily, N. (2017). The 2016 U.S. Election: Can Democracy Survive the Internet? *Journal of Democracy*, *28*(2), 63–76. https://doi.org/10.1353/JOD.2017.0025

Pillow, W. S. (2003). Confession, catharsis, or cure? Rethinking the uses of reflexivity as methodological power in qualitative research. *International Journal of Qualitative Studies in Education*, *16*(2), 175–196. https://doi.org/10.1080/0951839032000060635

PricewaterhouseCoopers. (2024). *Workers embrace AI and prioritise skills growth amid rising workloads and an accelerating pace of change: PwC 2024 Global Workforce Hopes & Fears Survey*. https://www.pwc.com/id/en/media-centre/press-release/2024/english/workers-embrace-ai-and-prioritise-skills-growth-amid-rising-work.html

Purtova, N. (2015). The illusion of personal data as no one's property. *Law, Innovation and Technology*, *7*(1), 83–111. https://doi.org/10.1080/17579961.2015.1052646

Rehman, I. (2019). Facebook-Cambridge Analytica data harvesting: What you need to know. *Library Philosophy and Practice (e-Journal)*. https://digitalcommons.unl.edu/libphilprac/2497

Rehman, M. A., Ahmed, M., & Sethi, D. S. (2025). AI-Based Credit Scoring Models in Microfinance: Improving Loan Accessibility, Risk Assessment, and Financial Inclusion. *The Critical Review of Social Sciences Studies*, *3*(1), 2997–3033. https://doi.org/10.59075/15HHFS58

Richardson, R., Schultz, J., & Crawford, K. (2019). *Dirty Data, Bad Predictions: How Civil Rights Violations Impact Police Data, Predictive Policing Systems, and Justice*. https://papers.ssrn.com/abstract=3333423

Rossini, P., Mont'alverne, C., & Kalogeropoulos, A. (2023). Explaining beliefs in electoral misinformation in the 2022 Brazilian election: The role of ideology, political trust, social media, and messaging apps. *Harvard Kennedy School Misinformation Review*, *4*(3). https://doi.org/10.37016/MR-2020-115

Salterio, S. E. (2022). Redressing the fundamental conflict of interest in public company audits. *International Journal of Auditing*, *26*(1), 48–53. https://doi.org/10.1111/IJAU.12269

Sardamov, I. (2012). From "Bio-Power" to "Neuropolitics": Stepping beyond Foucault. *Techné: Research in Philosophy and Technology*, *16*(2), 123–137. https://doi.org/10.5840/TECHNE201216212

Schartum, D. W. (2016). Law and algorithms in the public domain. *Etikk i Praksis*, *10*(1), 15–26. https://doi.org/10.5324/EIP.V10I1.1973

Schissler, M. (2024). Beyond Hate Speech and Misinformation: Facebook and the Rohingya Genocide in Myanmar. *Journal of Genocide Research*. https://doi.org/10.1080/14623528.2024.2375122

Schlumberger, O., Edel, M., Maati, A., & Saglam, K. (2023). How Authoritarianism Transforms: A Framework for the Study of Digital Dictatorship. *Government and Opposition*. https://doi.org/10.1017/GOV.2023.20

Schuler, D. (2022). Computing as Oppression: Authoritarian Technology Poses a Worldwide Threat. *Digital Government: Research and Practice*, *3*(4).

https://doi.org/10.1145/3568400
Selbst, A. D., & Powles, J. (2017). Meaningful information and the right to explanation. *International Data Privacy Law*, *7*(4), 233–242. https://doi.org/10.1093/IDPL/IPX022
Serpro. (2025). *National Intelligence Company in Digital Government and Information Technology*. https://www.serpro.gov.br/
Shahriari, K., & Shahriari, M. (2017). IEEE standard review - Ethically aligned design: A vision for prioritizing human wellbeing with artificial intelligence and autonomous systems. *IHTC 2017 - IEEE Canada International Humanitarian Technology Conference 2017*, 197–201. https://doi.org/10.1109/IHTC.2017.8058187
Shaima, M., Nabi, N., Rana, M. N. U., Islam, M. T., Ahmed, E., Tusher, M. I., Mukti, M. H., & Saad-Ul-Mosaher, Q. (2024). Elon Musk's Neuralink Brain Chip: A Review on 'Brain-Reading' Device. *Journal of Computer Science and Technology Studies*, *6*(1), 200–203. https://doi.org/10.32996/JCSTS.2024.6.1.22
Shams, B. (2025). *Comparative Legal Practices in Artificial Intelligence and Data Protection*. https://lawgazette.com.sg/feature/comparative-legal-practices-in-artificial-intelligence-and-data-protection/
Silakari, A. (2025). Evolving Privacy Rights: Legal Implications of Biometric Data Collection. *IJFMR - International Journal For Multidisciplinary Research*, *7*(3). https://doi.org/10.36948/IJFMR.2025.V07I03.45034
Silva, J., & Nahur, M. T. M. (2021). Governo Algorítmico e Conexões. *Revista de Filosofia Moderna e Contemporânea*, *8*(3), 155–180. https://doi.org/10.26512/RFMC.V8I3.34300
Siyuan, C. (2024). Regulating online hate speech: the Singapore experiment. *International Review of Law, Computers & Technology*, *38*(2), 119–139. https://doi.org/10.1080/13600869.2023.2295091
Smart Nation. (2023). *National Artificial Intelligence Strategy 2 to uplift Singapore's social and economic potential*. https://www.smartnation.gov.sg/media-hub/press-releases/04122023/
Smuha, N. A. (2024). *Algorithmic Rule By Law: How Algorithmic Regulation in the Public Sector Erodes the Rule of Law*. https://doi.org/10.1017/9781009427500
Som, B., & Chandana, D. (2024). Facial Recognition? An Analysis of Facial Recognition and Criminal Justice in India. *Law and Emerging Issues: Proceedings of the International Conference on Law and Emerging Issues (ICLEI 2023)*, 165–174. https://doi.org/10.4324/9781003428213-17/FACIAL-RECOGNITION-ANALYSIS-FACIAL-RECOGNITION-CRIMINAL-JUSTICE-INDIA-BODHISATTWA-SOM-DELHI-CHANDANA
Sonasri, S., Niranjana, B. P., S, S., Niranjana, B. P., S, S., S, S., & Niranjana, B. P. (2025). REGULATING AI: A COMPARATIVE ANALYSIS OF INDIA AND GLOBAL FRAMEWORKS. *IJCRT - International Journal of Creative Research Thoughts (IJCRT)*, *13*(4), a702–a710. http://www.ijcrt.org/viewfull.php?p_id=IJCRT2504090
Spensky, C., Stewart, J., Yerukhimovich, A., Shay, R., Trachtenberg, A., Housley, R., & Cunningham, R. K. (2016). SoK: Privacy on Mobile Devices – It's Complicated. *Proceedings on Privacy Enhancing Technologies*, *2016*(3), 96–116. https://doi.org/10.1515/POPETS-2016-0018
St. Pierre, E. A. (2021). Post Qualitative Inquiry, the Refusal of Method, and the Risk of the New. *Qualitative Inquiry*, *27*(1), 3–9. https://doi.org/10.1177/1077800419863005
Startup20. (2025). *Startup20 Communiqué: Recommendations and Policy Directives*. https://www.gov.br/g20/pt-br/g20-social/startup20

Susskind, Jamie. (2022). *The Digital Republic : on Freedom and Democracy in The 21st Century*. 442.

Tata Consulting. (2024). *DESIGNING THE FUTURE - 25th Annual Report 2023-2024*. https://www.tataconsultingengineers.com/annualreport2024/

TechPolicy. (2024). *Global Digital Policy Roundup 2024*. https://www.techpolicy.press/global-digital-policy-roundup-august-2024/

The South Centre. (2023). *South Centre Annual Report 2023*. https://www.southcentre.int/south-centre-annual-report-2023/

Troisi, E. (2022). Automated Decision Making and right to explanation. The right of access as ex post information. *European Journal of Privacy Law and Technologies*, *2022*(1), 181–202. https://doi.org/10.57230/EJPLT221ET

Turow, J. (2020). The Aisles Have Eyes. *The Aisles Have Eyes*. https://doi.org/10.12987/9780300225075/HTML

U4SSC. (2019). *Crime prediction for more agile policing in cities – Rio de Janeiro, Brazil*. https://igarape.org.br/wp-content/uploads/2019/10/460154_Case-study-Crime-prediction-for-more-agile-policing-in-cities.pdf

UK Goverment. (2021). *AI Barometer 2021*. https://www.gov.uk/government/publications/ai-barometer-2021

UN. Advisory Body on Artificial Intelligence. (2024). *Governing AI for humanity*. https://digitallibrary.un.org/record/4062495

UNCTAD. (2023). *World Investment Report 2023*.

UNCTAD. (2024). *Digital Economy Report 2024: Shaping an Environmentally Sustainable and Inclusive Digital Future*. https://doi.org/10.18356/9789213589779

UNESCO. (2025). *Brazil: readiness assessment report on artificial intelligence*. https://unesdoc.unesco.org/ark:/48223/pf0000393091

UN-HABITAT. (2024). *Global assessment of Responsible AI in cities Research and recommendations to leverage AI for people-centred smart cities*. https://unhabitat.org/sites/default/files/2024/08/global_assessment_of_responsible_ai_in_cities_21082024.pdf#:

UNHRC. (2022). *The right to privacy in the digital age : Report of the Office of the United Nations High Commissioner for Human Rights*. UN,. https://digitallibrary.un.org/record/3985679

Valsiner, J. (2019). *From Causality to Catalysis in the Social Sciences*. 125–146. https://doi.org/10.1007/978-3-030-33099-6_8

Veale, M., & Zuiderveen Borgesius, F. (2021). *Demystifying the Draft EU Artificial Intelligence Act*. https://papers.ssrn.com/abstract=3896852

Veitch, S., Christodoulidis, E., & Goldoni, M. (2018). Displacing the juridical. *Jurisprudence*, 274–281. https://doi.org/10.4324/9781315795997-24

Villar, M. P. (2024). *THE ROLE OF GENERATIVE ARTIFICIAL INTELLIGENCE (GAI) IN ELECTORAL DISINFORMATION (What evidence exists on the use of GAI to spread disinformation in elections in Latin America?)*. Friedrich-Naumann-Stiftung für die Freiheit. https://www.freiheit.org/argentina-brazil-paraguay-and-uruguay/artificial-intelligence-and-electoral-disinformation

Wachter, S., Mittelstadt, B., & Floridi, L. (2017). Why a Right to Explanation of Automated Decision-Making Does Not Exist in the General Data Protection Regulation. *International Data Privacy Law*, *7*(2), 76–99. https://doi.org/10.1093/IDPL/IPX005

Wang, X., Zhang, Y., & Zhu, R. (2022). A brief review on algorithmic fairness. *Management*

*System Engineering 2022 1:1*, *1*(1), 1–13. https://doi.org/10.1007/S44176-022-00006-Z

Wardi, A., & Aditya, G. (2025). NAVIGATING ETHICAL DILEMMAS IN ALGORITHMIC DECISION-MAKING: A CASE-BASED STUDY OF FINTECH PLATFORMS. *Jurnal Akuntansi Dan Bisnis*, *5*(1), 29–38. https://doi.org/10.51903/JIAB.V5I1.1044

Wheeler, T. (2023). *The three challenges of AI regulation*. https://www.brookings.edu/articles/the-three-challenges-of-ai-regulation/

Williamson, B., Gulson, K. N., Perrotta, C., & Witzenberger, K. (2022). Amazon and the New Global Connective Architectures of Education Governance. *Harvard Educational Review*, *92*(2), 231–256. https://doi.org/10.17763/1943-5045-92.2.231

Xinran. (2019). China in their hands. *Index on Censorship*, *48*(2), 74–76. https://doi.org/10.1177/0306422019858298/ASSET/7B7F0261-CAB9-4A25-8383-A4CC0F0FDA2B/ASSETS/IMAGES/LARGE/10.1177_0306422019858298-FIG2.JPG

Yerramsetti, S. (2023). Public sector digitalisation and stealth intrusions upon individual freedoms and democratic accountability. *Asia Pacific Journal of Public Administration*, *45*(1), 54–72. https://doi.org/10.1080/23276665.2022.2110909

Yilmaz, I., & Yang, F. (2023). Digital authoritarianism, religion and future of democracy. *Digital Authoritarianism and Its Religious Legitimization: The Cases of Turkey, Indonesia, Malaysia, Pakistan, and India*, 151–166. https://doi.org/10.1007/978-981-99-3600-7_7

Yordan, J. (2024). *Southeast Asia remains important market for Alibaba*. https://www.techinasia.com/southeast-asia-remains-important-market-alibaba-exec

Zhao, Z. (2023). Algorithmic Personalized Pricing with the Right to Explanation. *Journal of Competition Law and Economics*, *19*(3), 367–396. https://doi.org/10.1093/JOCLEC/NHAD008

Zou, C., & Zhang, F. (2022). Algorithm Interpretation Right—The First Step to Algorithmic Governance. *Beijing Law Review*, *13*(02), 227–246. https://doi.org/10.4236/BLR.2022.132015

Zuboff, S. (2019). *The Age of Surveillance Capitalism: The Fight for a Human Future at the New Frontier of Power*. PublicAffairs. https://doi.org/10.2307/j.ctv1kmjnhs