Lex Publica
Jurnal Ilmu Hukum Asosiasi Pimpinan Perguruan Tinggi Hukum Indonesia
e-ISSN: 2579-8855
p-ISSN: 2354-9181
https://journal.appthi.org/index.php/lexpublica

Shaping Artificial Intelligence Governance and Risk Management in the Public Sector: Regulatory Insights

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Abstract. As AI continues to transform public services by enhancing efficiency, transparency, and decision-making, it also brings forth significant challenges related to data privacy and misuse. This research explores the intersection of risk management and AI governance within Indonesia's public administration, by conceptualizing how Indonesia's legal frameworks, regulations, and policies should evolve to accommodate AI technologies responsibly. The research employs a conceptual approach to analyze existing laws, including the Personal Data Protection Act and the Information and Electronic Transactions Law, alongside international best practices. The findings emphasize the need for a clear and cohesive regulatory framework that governs AI usage, with a focus on data privacy, ethical AI use, and transparency. It is concluded that Indonesia must strengthen its data protection laws, address the shortage of AI professionals, and improve infrastructure to ensure the responsible implementation of AI in public administration.

Keywords: Artificial Intelligence (AI), Governance, Risk Management, Data Privacy, Public Sector.

Abstrak. *Seiring dengan terus berkembangnya AI yang mengubah layanan publik melalui peningkatan efisiensi, transparansi, dan pengambilan keputusan, AI juga menghadirkan tantangan signifikan terkait privasi data dan penyalahgunaannya. Penelitian ini mengeksplorasi persimpangan antara manajemen risiko dan tata kelola AI dalam administrasi publik Indonesia, dengan mengkonseptualisasikan bagaimana kerangka hukum, regulasi, dan kebijakan Indonesia seharusnya berkembang untuk mengakomodasi teknologi AI secara bertanggung jawab. Penelitian ini menggunakan pendekatan konseptual untuk menganalisis hukum yang ada, termasuk Undang-Undang Perlindungan Data Pribadi dan Undang-Undang Informasi dan Transaksi Elektronik, bersama dengan praktik terbaik internasional. Temuan penelitian menekankan perlunya kerangka regulasi yang jelas dan kohesif yang mengatur penggunaan AI, dengan fokus pada privasi data, penggunaan AI yang etis, dan transparansi. Disimpulkan bahwa Indonesia perlu memperkuat hukum perlindungan data, mengatasi kekurangan profesional AI, dan meningkatkan infrastruktur untuk memastikan implementasi AI yang bertanggung jawab dalam administrasi publik.*

Kata kunci: *Kecerdasan Buatan (AI), Tata Kelola, Manajemen Risiko, Privasi Data, Sektor Publik.*

1. Introduction

The rapid advancement of Artificial Intelligence (AI) has introduced significant opportunities and challenges across various sectors, particularly in public administration. AI has the potential to transform public service delivery, enhance decision-making, and improve overall efficiency.[1] However, this progress comes with critical concerns, notably the risk of data misuse and breaches, which pose serious threats to privacy and security. Related to data protection, Indonesia still lacks comprehensive and robust regulatory frameworks to effectively safeguard citizens' personal data from emerging cyber threats. The recent data breach involving Indonesia's Ministry of Communication and Information exposed sensitive personal data, including National ID numbers and bank details, which were sold on dark web forums.[2] This incident, along with similar breaches affecting other public entities like Kereta Api Indonesia (KAI), reveals a persistent threat to the privacy and security of public data.[3] According to Tempo report, data privacy breaches have become a persistent issue in Indonesia during President Joko Widodo's administration (2014-2024), with numerous incidents involving both private and government sector data, including the 2024 leak of 6 million taxpayer IDs, data from the Ministry of Home Affairs in 2019, COVID-19 patient data in 2020, BPJS Health records in 2021, and hacker Bjorka's leaks in 2022 and 2023, exposing ongoing cybersecurity weaknesses.[4]

With the growing use of AI in various sectors, there is an opportunity for its application in the public sector.[5] While AI presents significant opportunities, it can

[1] Abhinandan Kulal et al., "Enhancing public service delivery efficiency: Exploring the impact of AI," *Journal of Open Innovation: Technology, Market, and Complexity* 10, no. 3 (2024): 100329. See also, Madalina Busuioc, "Accountable artificial intelligence: Holding algorithms to account," *Public administration review* 81, no. 5 (2021): 828.

[2] Agustin Setyo Wardani, "Data Diduga Milik Kominfo Bocor, Dijual Rp 1,9 Miliar di BreachForums," *Liputan6*, July 2, 2024, https://www.liputan6.com/tekno/read/5632942/data-diduga-milik-kominfo-bocor-dijual-rp-19-miliar-di-breachforums?page=3.

[3] Diva Lufiana Putri and Inten Esti Pratiwi, "Data KAI Commuter Diduga Bocor dan Dijual, KCI: Peretasan Menggunakan Akun Pegawai," *Kompas*, July 3, 2024. https://www.kompas.com/tren/read/2024/07/03/081500465/data-kai-commuter-diduga-bocor-dan-dijual-kci--peretasan-menggunakan-akun%20pegawai.

[4] Tempo, "Daftar Kebocoran Data Pribadi di Era Jokowi, Paling Banyak di Instansi Pemerintah," *Tempo,* September 21, 2024, https://www.tempo.co/politik/daftar-kebocoran-data-pribadi-di-era-jokowi-paling-banyak-di-instansi-pemerintah-7403.

[5] Kevin C. Desouza, Gregory S. Dawson, and Daniel Chenok, "Designing, developing, and deploying artificial intelligence systems: Lessons from and for the public sector," *Business Horizons* 63, no. 2 (2020): 210. See also, Colin Van Noordt and Gianluca Misuraca, "Exploratory insights on artificial intelligence for government in Europe," *Social Science Computer Review* 40, no. 2 (2022): 429.

also pose risks for developing nations like Indonesia, where infrastructure weaknesses make systems vulnerable to fraud and data breaches. This vulnerability is further compounded by limited regulatory frameworks that fail to address emerging AI-related threats. Without adequate safeguards, AI protection can lead to privacy violations, data manipulation, and the exploitation of sensitive information, whether on a national or global scale. For instance, a cyber incident involving OpenAI's ChatGPT was reported in May 2023, where a vulnerability in ChatGPT's plugin system, known as "indirect prompt injection," was exploited by the actor group *Embrace The Red* to steal conversation history and potentially leak personal identifiable information (PII) from users.[6] In a separate case, in 2023, a security flaw was discovered in Microsoft's Bing Chat, demonstrating how attackers could manipulate the service to exfiltrate personal data by injecting malicious scripts into open webpages.[7] Another significant event occurred in July 2023 when Mithril Security researchers exposed vulnerabilities in HuggingFace's LLM repository by uploading a poisoned model, revealing the risks of the open-source model supply chain.[8] These incidents highlight the growing number of threats targeting AI systems and their associated infrastructure.

Most AI systems, especially those based on machine learning, require large amounts of personal data to function properly.[9] The data collected often includes sensitive information such as health history, online behavior, and user location. As AI technologies become more integrated into public sector operations, the need for a comprehensive governance framework to manage these risks is increasingly urgent. However, to the best of our knowledge, there are few studies that analyze the vulnerability of AI use in the public sector of developing countries, especially Indonesia, particularly when focusing on its integration with risk management frameworks and public data protection. While studies on AI governance in Southeast Asia and Indonesia exist,[10] few address its intersection with risk

[6] Department for Science, Innovation & Technology, "Cyber Security Risks to Artificial Intelligence," *Research and analysis*, May 15, 2024, https://www.gov.uk/government/publications/research-on-the-cyber-security-of-ai/cyber-security-risks-to-artificial-intelligence. See also, Maanak Gupta et al., *From chatgpt to threatgpt: Impact of generative ai in cybersecurity and privacy*, (New Jersey: IEEE Access, 2023), 80219.

[7] Kai Greshake et al., "Not what you've signed up for: Compromising real-world llm-integrated applications with indirect prompt injection," In *Proceedings of the 16th ACM Workshop on Artificial Intelligence and Security* 4, no. 3 (2023): 82.

[8] Changwu Huang et al., "An overview of artificial intelligence ethics," *IEEE Transactions on Artificial Intelligence* 4, no. 4 (2022): 802.

[9] Yuji Roh, Geon Heo, and Steven Euijong Whang, "A survey on data collection for machine learning: a big data-ai integration perspective," *IEEE Transactions on Knowledge and Data Engineering* 33, no. 4 (2019): 1328. See also, André Steimers and Moritz Schneider, "Sources of risk of AI systems," *International Journal of Environmental Research and Public Health* 19, no. 6 (2022): 3641.

[10] Andrew J. Keith, "Governance of artificial intelligence in Southeast Asia," *Global Policy* 15, no. 5 (2024): 943. See also, Bevaola Kusumasari and Bernardo Nugroho Yahya, "Algorithmic

management in public administration. Some research highlights the need for AI governance,[11] but few explore how frameworks should evolve to include risk management for personal data protection as AI becomes more embedded in public sector operations. Furthermore, some studies present lessons from international frameworks[12] but fall short of addressing Indonesia's unique governance challenges and the integration of AI-driven decision-making within existing bureaucratic systems. Moreover, while other studies discuss the potential for AI applications in public administration,[13] there is a gap in understanding how Indonesia's legal and regulatory frameworks can mitigate risks associated with these technologies. Moreover, some studies have examined AI's use in education, higher education institutions, and various public services,[14] but they did not focus on data protection challenges or the development of a conceptual framework for effective AI regulation.

Thus, to fill this gap, this research is conducted to explore the intersection of AI governance and risk management within Indonesia's public administration. The primary goal is to develop a conceptual framework for AI governance in public sector, with a focus on risk management and data protection challenges. A

governance and AI: balancing innovation and oversight in Indonesian policy analyst," *Ai & Society* 5, no. 4 (2024): 11.

[11] Sonia Ivana Barus Amancik et al., "Reforming the Indonesian Bureaucracy through State Civil Apparatus Reform, Could It be Optimized with Technology?," *Journal of Law and Legal Reform* 5, no. 3 (2024): 121.

[12] Beny Saputra and Olivér Bene, "Hungary's AI Strategy: Lessons for Indonesia's AI Legal Framework Enhancement," *Jambe Law Journal* 7, no. 1 (2024): 43. See also, Rofi Aulia Rahman et al., "Constructing Responsible Artificial Intelligence Principles as Norms: Efforts to Strengthen Democratic Norms in Indonesia and European Union," *Padjadjaran Jurnal Ilmu Hukum* 9, no. 2 (2022): 235.

[13] Rendy Pahrun Wadipalapa et al., "An Ambitious Artificial Intelligence Policy in a Decentralised Governance System: Evidence From Indonesia," *Journal of Current Southeast Asian Affairs* 43, no. 1 (2024): 69. See also, Arfah Habib Saragih et al., "The potential of an artificial intelligence (AI) application for the tax administration system's modernization: the case of Indonesia," *Artificial Intelligence and Law* 31, no. 3 (2023): 511; Editha Praditya et al., "National Cybersecurity Policy Analysis for Effective Decision-Making in the Age of Artificial Intelligence," *Journal of Human Security* 19, no. 2 (2023): 99.

[14] Buddhini Amarathunga, "ChatGPT in education: unveiling frontiers and future directions through systematic literature review and bibliometric analysis," *Asian Education and Development Studies* 13, no. 5 (2024): 421. See also, Anto Hidayat Helmiatin and Muhammad Ridwan Kahar, "Investigating the adoption of AI in higher education: a study of public universities in Indonesia," *Cogent Education* 11, no. 1 (2024): 2380175; Rahman Mulyawan, "Can trust in government help to enhance Indonesian citizens' involvement in Al-based public service?," *Journal of Entrepreneurship and Public Policy* 13, no. 4 (2024): 522; Ardianto Budi Rahmawan and Gabriela Eliana, "Deploying AI in taking down Indonesian regulatory problems: A study on early pandemic regulations," *Kasetsart Journal of Social Sciences* 43, no. 4 (2022): 935.

conceptual approach is employed to examine how legal frameworks, regulations, and policies governing AI usage should evolve to address these issues.

2. Research Methods

The research employed a conceptual approach to examine the governance of Artificial Intelligence (AI) in Indonesia's laws and public administration, with a focus on risk management and data protection challenges. This method aimed at exploring the current condition of AI regulations in Indonesia and conceptualizing how legal frameworks, regulations, and policies governing AI usage should evolve. A conceptual approach was used to explore the conceptual ideas of how to frame the legal governance of AI by reviewing relevant Indonesian laws and policies, such as the Personal Data Protection Act, the Information and Electronic Transactions Law, and other related regulations. To enrich the best practices, the research also involved comparative analysis by referencing international best practices and current regulations of AI governance from countries such as the EU, the United States, and China. This helped identify lessons and strategies applicable to Indonesia. The study ultimately aimed to propose actionable policy recommendations that balanced innovation with data protection and citizen rights, ensuring that AI technologies could be implemented responsibly within Indonesia's unique legal and cultural context.

3. Results and Discussion

3.1. Artificial Intelligence for Governance and Public Service: Opportunities, Challenges, and Global Applications

According to Sun and Medaglia[15] and Russell & Norvig,[16] Artificial Intelligence (AI) technologies are defined as devices that perceive their environment and take actions to optimize their chances of achieving specific goals. In essence, AI refers to the simulation of human intelligence in machines that are programmed to think, learn, and problem-solve autonomously, allowing them to adapt and make decisions in complex, dynamic environments. These technologies encompass a range of approaches, including machine learning, rule-based systems, natural

[15] Tara Qian Sun and Rony Medaglia, "Mapping the challenges of Artificial Intelligence in the public sector: Evidence from public healthcare," *Government Information Quarterly* 36, no. 2 (2019): 379.

[16] Stuart J. Russell and Peter Norvig, *Artificial intelligence: a modern approach*, (London: Pearson, 2016), 132.

language processing, and speech recognition, all of which enable machines to perform tasks traditionally requiring human intelligence.[17]

The integration of artificial intelligence (AI) offers governments a significant opportunity to enhance transparency, accountability, and responsiveness to societal needs in a more timely and effective manner. For example, the World Economic Forum (WEF) highlights that AI has the potential to greatly improve government operations, addressing citizen needs in innovative ways—ranging from traffic management and healthcare delivery to the processing of tax forms.[18] These advancements are expected to foster the development of a governance framework that is both responsive and adaptive to the evolving challenges of a rapidly changing societal landscape. AI has become a key technological driver, catalyzing transformative changes across various sectors, including public administration.[19] Its ability to rapidly analyze large datasets, identify patterns, and autonomously generate decisions is reshaping operational workflows and decision-making within governmental institutions.[20]

Interest in using Artificial Intelligence (AI) in the public sector continues to grow, driven by the potential for smarter, more personalized, lean, and efficient public services.[21] In parallel, AI technologies in public administration are receiving increasing attention due to the potential benefits they offer in enhancing governmental operations and service delivery.[22] A key factor for successful implementation is citizen acceptance. Some studies found that AI is generally preferred in public services, although certain services are still better handled by

[17] William D. Eggers, David Schatsky, and Peter Viechnicki, "AI-augmented government. Using cognitive technologies to redesign public sector work," *Deloitte Center for Government Insights* 1, no.3 (2017): 31.

[18] World Economic Forum, "*Unlocking Public Sector Artificial Intelligence*," n.d, https://www.weforum.org/projects/unlocking-public-sector-artificial-intelligence/.

[19] Abdullah M. Al-Ansi et al., "Elevating e-government: Unleashing the power of AI and IoT for enhanced public services," *Heliyon* 10, no. 23 (2024): 45. See also, Jonathan Jacob Paul Latupeirissa et al., "Transforming public service delivery: A comprehensive review of digitization initiatives," *Sustainability* 16, no. 7 (2024): 2818; Ignat Kulkov et al., "Artificial intelligence-driven sustainable development: Examining organizational, technical, and processing approaches to achieving global goals," *Sustainable Development* 32, no. 3 (2024): 2259.

[20] Araz Taeihagh, "Governance of artificial intelligence," *Policy and society* 40, no. 2 (2021): 143.

[21] Rohit Madan and Mona Ashok, "AI adoption and diffusion in public administration: A systematic literature review and future research agenda," *Government Information Quarterly* 40, no. 1 (2023): 101774. See also, Giulia Maragno et al., "Exploring the factors, affordances and constraints outlining the implementation of Artificial Intelligence in public sector organizations," *International Journal of Information Management* 73 (2023): 102686.

[22] Colin Van Noordt and Luca Tangi, "The dynamics of AI capability and its influence on public value creation of AI within public administration," *Government Information Quarterly* 40, no. 4 (2023): 101867.

humans.[23] From a public perspective, a key driver of AI acceptance is the concerns or reasons for its use, highlighting the importance of addressing these concerns to increase acceptance and offering strategies to effectively communicate and implement this technology in a way that is likely to be embraced by citizens.[24] This understanding is essential for ensuring the successful integration of AI-based software into public services, ultimately improving efficiency and service delivery in the public sector.

Despite these promising developments, many public institutions have yet to embrace this powerful technology. While public sector officials increasingly recognize the transformative potential of AI-driven solutions, the data required for the development and deployment of such solutions remains largely inaccessible and difficult to discover. [25] However, in certain sectors like healthcare, AI has already demonstrated its potential. Artificial intelligence (AI) has significantly enhanced healthcare by enabling earlier disease detection, supporting clinical decision-making, and tracking patient health in real-time. In the UK, the National Health Service (NHS) has implemented AI in initiatives such as the National COVID-19 Chest Imaging Collection (NCCID) for analyzing chest X-rays, and developed an AI tool capable of diagnosing heart disease in just 20 seconds, demonstrating AI's potential to improve diagnostic efficiency and healthcare delivery.[26] Moreover, AI has also been effectively utilized in other sectors, such as public administration. Revenue New South Wales, Australia, has been using artificial intelligence since 2018 to identify and assist disadvantaged customers unable to pay their penalties, providing alternative settlement options and diverting vulnerable clients from enforcement actions. The AI program predicts customer vulnerability by analyzing various indicators, allowing for more efficient and targeted resolution while supplementing human decision-making to ensure appropriate support is provided to those in need.

Furthermore, the French government, in collaboration with Capgemini and Google, developed AI technology to analyze aerial images, uncovering 20,000 previously unknown ponds and generating an additional €10 million in tax revenue,

[23] Ines Mergel et al., "Implementing AI in the public sector," *Public Management Review* 12, no. 2 (2024): 11. See also, Sun and Medaglia, "Mapping the challenges of Artificial Intelligence in the public sector," 376; Tao Chen et al., "AI-based self-service technology in public service delivery: User experience and influencing factors," *Government Information Quarterly* 38, no. 4 (2021): 101523; Ozlem Ozmen Garibay et al., "Six human-centered artificial intelligence grand challenges," *International journal of human computer interaction* 39, no. 3 (2023): 398.

[24] Tanja Sophie Gesk and Michael Leyer, "Artificial intelligence in public services: When and why citizens accept its usage," *Government Information Quarterly* 39, no. 3 (2022): 101709.

[25] World Economic Forum, "*Unlocking Public Sector Artificial Intelligence*," n.d https://www.weforum.org/projects/unlocking-public-sector-artificial-intelligence/.

[26] Khalifa Alhosani and Saadat M. Alhashmi, "Opportunities, challenges, and benefits of AI innovation in government services: a review," *Discover Artificial Intelligence* 4, no. 1 (2024): 21.

with plans to identify unregistered structures like gazebos and patios. Similarly, AI systems like Near Map are used by US federal departments and insurance companies to monitor physical assets for tampering, demonstrating how AI aids governments in better managing infrastructure and detecting tax evasion or illicit property transfers.[27] In a similar vein, Belgium has leveraged AI as a powerful tool for smarter, public-interest policy-making, enabling government agencies and politicians to conduct in-depth analyses of publicly available data to identify emerging issues and trends. A notable example is the use of an AI crowdsourcing tool during the 2019 climate change rallies, developed by Citizen Lab, which helped Belgian authorities better understand protesters' demands and prioritize 15 climate action initiatives based on AI-driven insights into public sentiment.[28]

3.2. The Challenges of AI Implementation in Public Sector Governance in Indonesia

In Indonesia, where personal data protection remains an ongoing issue,[29] the rapid development of AI technology raises concerns about privacy and security. Concerns about unauthorized access to sensitive information and the potential exploitation of data are exacerbated by the lack of a clear framework that defines how AI should be used within the boundaries of privacy rights. This highlights weaknesses in digital adoption, particularly as new technologies emerge. For instance, while Indonesia is still challenged with tightening personal data protection, emerging AI technologies further complicate the management and safeguarding of such data. Without clear regulations on the use of personal data in AI, concerns about misuse and potential data breaches arise. This further deepens public skepticism regarding the government's ability to manage AI responsibly. The absence of adequate rules on ethics and AI usage in the public sector also worsens the issue, as the public feels uncertain that the technology can be used optimally and safely.[30] In this situation, transparency and legal certainty are crucial for the widespread acceptance of AI adoption. Without clear regulations, the government

[27] Spyros Makridakis, "The forthcoming Artificial Intelligence (AI) revolution: Its impact on society and firms," *Futures* 90, no. 3 (2017): 49.

[28] Alhosani and Alhashmi, "Opportunities, challenges, and benefits of AI innovation in government services," 24.

[29] Ni Komang Sutrisni et al., "The Compliance of Governance on Family Data Protection Regulation," *Journal of Human Rights, Culture and Legal System* 4, no. 3 (2024): 712. See also, Endah Fuji Astuti et al., "Assessing Indonesian MSMEs' Awareness of Personal Data Protection by PDP Law and ISO/IEC 27001: 2013," *International Journal of Safety & Security Engineering* 14, no. 5 (2024): 1562; Ahdiana Yuni Lestari et al., "Improving Healthcare Patient Data Security: An Integrated Framework Model for Electronic Health Records From A Legal Perspective," *Law Reform: Jurnal Pembaharuan Hukum* 20, no. 2 (2024): 352.

[30] Gesk and Leyer, "Artificial intelligence in public services," 101704.

struggles to explain how AI will be used ethically and responsibly, ultimately eroding public trust in the technology.

The gap in regulation is concerning, as it opens the door to unintended consequences, such as data misuse or violations of citizens' rights, which could further damage public trust in the government's capacity to safeguard this technology. Furthermore, the focus on privacy protection, as highlighted by Yerlikaya and Erzurumlu,[31] emphasizes the importance of understanding the legal framework governing AI functions. Additionally, Madan and Ashok[32] explain that AI applications in public administration, such as in tax collection, healthcare, and public services, heavily rely on access to citizens' personal data. However, the lack of a coherent regulatory framework in Indonesia creates an atmosphere of uncertainty. Ethical issues, such as privacy and data transparency, remain unresolved.

Furthermore, AI regulation in the Indonesian public sector is still very weak and slow. Several existing legal frameworks do not specifically explain how and where the application of AI can accelerate public services. This is due to the lack of qualified talent in the technology sector and the weakness of the existing legal framework. For example, although several government agencies such as the Ministry of Communication and Information have relaxed regulations, the regulations are not yet structured and applicable, so that the development and utilization of AI in public services are hampered. In Indonesia, the use of Artificial Intelligence (AI) in government is gaining more attention. However, regulation of AI in Indonesia's public sector remains weak and slow, with existing arguments failing to specifically explain how and where AI implementation can accelerate public services.[33] Several agencies, such as the Ministry of Communication and Information Technology (Kominfo), have demonstrated their commitment to developing regulations to support AI utilization in Indonesia.[34] The Circular Letter

[31] Sertaç Yerlikaya and Yaman Ömer Erzurumlu, *Artificial intelligence in public sector: a framework to address opportunities and challenges,* (Berlin: springer nature, 2021): 211. See also, Alhosani and Alhashmi, "Opportunities, challenges, and benefits of AI innovation in government services," 23.

[32] Madan and Ashok, "AI adoption and diffusion in public administration," 101777.

[33] Alvin Mahamidi, "Pemanfaatan Kecerdasan Buatan (AI) dalam Pemerintahan," *DJKN Kemenkeu*, June 27, 2023, https://www.djkn.kemenkeu.go.id/kanwil-banten/baca-artikel/16228/Pemanfaatan-Kecerdasan-Buatan-AI-dalam-Pemerintahan.html. See also, Arip Budiyanto, "Pemanfaatan Kecerdasan Buatan dalam Lembaga Pemerintah: Meningkatkan Efisiensi dan Pelayanan Publik yang Lebih Baik," *DJKN Kemenkeu*, August 29, 2023, https://www.djkn.kemenkeu.go.id/kpknl-manado/baca-artikel/16383/Pemanfaatan-Kecerdasan-Buatan-dalam-Lembaga-Pemerintah-Meningkatkan-Efisiensi-dan-Pelayanan-Publik-Yang-Lebih-Baik.html.

[34] Hanifah Triari Husna, "Kominfo Berkomitmen Atur Regulasi, Beri Peluang Pemanfaatan AI," *Aptika Kominfo*, November 1, 2023, https://aptika.kominfo.go.id/2023/11/kominfo-berkomitmen-atur-regulasi-beri-peluang-pemanfaatan-ai/.

of the Minister of Communication and Information of the Republic of Indonesia Number 9 of 2023, concerning Artificial Intelligence Ethics, is the most specific regulation so far regarding the application of AI technology, with a focus on ethical considerations. These ethical principles include inclusivity, humanity, security, accessibility, transparency, credibility, accountability, data privacy protection, sustainability, and intellectual property. The implementation of AI must consider equality, justice, human rights, and its impact on humans and the environment. Its execution involves oversight by the government and relevant parties to prevent misuse of the technology, ensure the privacy and security of user data, and protect the public, prevent racism, and avoid using AI for decisions related to humanity.

Additionally, the Code of Ethics for Responsible and Trustworthy Artificial Intelligence in the Financial Technology Industry by Financial Services Authority (*Otoritas Jasa Keuangan/OJK)* aims to ensure that the use of AI in the fintech sector operates ethically, safeguarding public interests and mitigating risks.[35] This guideline includes fundamental principles such as basing actions on Pancasila, benefiting consumer welfare, fairness and accountability in the use of data and algorithms, transparency in AI processes that can be explained to consumers, and robustness and security against cyber attacks. Supporting factors include continuous testing, human involvement in the process, proper privacy policies, and consistency in data and algorithms to ensure that AI applications in fintech are ethical, trustworthy, and provide added value for financial inclusion and sustainable economic growth.

The scarcity of guidelines highlights the challenges in implementing AI across various government sectors, as the use of AI in the public sector requires strong legal certainty to avoid misuse and ensure that this technology is applied transparently, fairly, and responsibly. Furthermore, without clear regulations, AI implementation in the public sector will be hindered by challenges such as mismatched information systems between government agencies and the lack of adequate infrastructure. Even though steps have been taken by several ministries and agencies, AI utilization in Indonesia remains limited compared to developed countries that have more mature policies and regulations on this technology, such as the UK, Canada, Australia, or Belgium, which have more structured and clear approaches to using AI to improve public services.

[35] Pembaruan Hukum, "Regulation of Artificial Intelligence in Indonesia," *SSEK Legal Consultants*, February 29, 2024, https://ssek.com/blog/indonesia-law-update-regulation-of-artificial-intelligence/?lang=id; See also, Otoritas Jasa Keuangan (OJK), "Panduan Kode Etik Kecerdasan Buatan (AI) yang Bertanggung Jawab dan Terpercaya di Industri Teknologi Finansial," *Otoritas Jasa Keuangan (OJK)*, 4 Desember 2023, https://ojk.go.id/id/berita-dan-kegiatan/publikasi/Pages/Panduan-Kode-Etik-Kecerdasan-Buatan-AI-yang-Bertanggung-Jawab-dan-Terpercaya-di-Industri-Teknologi-Finansial.aspx.

3.3. Strategies to Increase Governance in AI Adoption in Indonesia's Public Sector

To address the challenges surrounding the adoption of Artificial Intelligence (AI) in Indonesia's public sector, a set of strategies is necessary. These strategies should focus on key issues identified such as the absence of a clear regulatory framework and concerns about data misuse and leakage. One of the first priorities should be the creation of a clear, cohesive regulatory framework that governs AI use in the public sector. Specifically for Indonesia, this framework should include explicit guidelines on data privacy, the ethical use of AI, and transparency standards. The involvement of stakeholders, such as legislators, technology experts, and civil society groups, will be critical in ensuring that the regulations are comprehensive, inclusive, and aligned with international best practices. An example of such a framework is the EU AI Act, the world's first comprehensive AI regulation, which will be fully applicable by 2026.[36] The EU AI Act classifies AI systems based on their risk levels, with higher risks requiring more stringent oversight. Unacceptable risks, such as AI systems used for cognitive manipulation or social scoring, will be banned, while high-risk systems in areas like healthcare, law enforcement, and public services will undergo rigorous assessments. Generative AI must meet transparency requirements, including disclosing AI-generated content and adhering to copyright laws. The Act also encourages innovation by offering testing environments for start-ups. The European Commission aims to make the public sector a leader in AI use, particularly in healthcare, transport, and justice. The Act also highlights the importance of setting clear standards and calls for updates to the rules to keep up with the fast development of AI technology.[37] However, while promoting AI adoption, it is crucial to address concerns about maintaining public trust, as the misuse or lack of transparency in AI could undermine the credibility and support of public institutions.[38]

The second strategy in the context of Indonesia is strengthening data protection and preventing misuse. Given the potential risks associated with AI,

[36] European Parliament, "EU AI Act: First Regulation on Artificial Intelligence," *European Parliament* last modified June 1, 2023, https://www.europarl.europa.eu/topics/en/article/20230601STO93804/eu-ai-act-first-regulation-on-artificial-intelligence.

[37] Marta Cantero Gamito and Christopher T. Marsden, "Artificial intelligence co-regulation?: the role of standards in the EU AI Act," *International Journal of Law and Information Technology* 32, no. 1 (2024): eaae011. See also, Christian Montag and Michèle Finck, "Successful implementation of the EU AI Act requires interdisciplinary efforts," *Nature Machine Intelligence* 8, no. 2 (2024): 10.

[38] Johann Laux, Sandra Wachter, and Brent Mittelstadt, "Trustworthy artificial intelligence and the European Union AI act: On the conflation of trustworthiness and acceptability of risk," *Regulation & Governance* 18, no. 1 (2024): 29. See also, Gamito and Marsden, "Artificial intelligence co-regulation?: the role of standards in the EU AI Act," eaae011.

especially in terms of misuse and data leakage, implementing robust data protection is crucial. Indonesia recently passed the Law No. 27 of 2022 on Personal Data Protection. The implication is that national data protection policies must be more rigorously enforced by corporations and public bodies. However, AI regulation has not yet been clearly addressed in this law. From a regulatory perspective, this should simplify efforts to safeguard sensitive data by focusing on encryption, anonymization, and secure storage. Furthermore, transparency in data usage should be prioritized, ensuring that individuals are fully aware of how their data is collected, stored, and used by AI systems. Although AI's potential for big data applications in both private and public sectors is evident, specific regulation of its use is still absent from the Personal Data Protection Law. This gap leaves enforcement mechanisms regarding the potential misuse of AI technology and data questionable. This is confirmed in previous studies have shown that while AI improves efficiency, it raises privacy concerns, such as unintended personal disclosures and challenges in removing data from AI systems upon user request.[39] In Indonesia, so far, these issues are only regulated by the Personal Data Protection Law and have not been specifically addressed with respect to AI.

In global scale, the current report from the AI Watch database shows that the regulation of Artificial Intelligence (AI) is evolving globally, with countries introducing specific bills and frameworks to govern AI technologies.[40] In the U.S., AI regulation largely relies on existing federal laws, but there is an ongoing effort to establish AI-specific legislation. For example, California's SB 892 bill mandates that businesses providing AI services to state agencies must meet safety, privacy, and nondiscrimination standards.[41] More than 120 AI-related bills are under consideration in the U.S. Congress, covering diverse issues such as AI's role in national security, education, copyright, and even preventing AI from launching nuclear weapons autonomously.[42] These bills reflect the broad range of concerns surrounding AI's integration into society, addressing potential risks as well as its benefits. Similarly, China's Cyberspace Administration and other government

[39] Philip Menard and Gregory J. Bott, "Artificial intelligence misuse and concern for information privacy: New construct validation and future directions," *Information Systems Journal* 19, no. 3 (2024): 19.

[40] AI Watch, *Global Regulatory Tracker*, New York: White & Case, n.d, https://www.whitecase.com/insight-our-thinking/ai-watch-global-regulatory-tracker#home.

[41] Evan Symon, "Two AI Bills Introduced in California Senate: Bills Would Add Guardrails, Promote AI Growth," *California Globe*, January 5, 2024, https://californiaglobe.com/fr/two-ai-bills-introduced-in-california-senate/. See also, Oxford Analytica, *California's AI Safety Bill faces political obstacles*, (United State: Expert Briefings, 2024), 121.

[42] Scott J. Mulligan, "There Are More Than 120 AI Bills in Congress Right Now," *MIT Technology Review*, September 18, 2024, https://www.technologyreview.com/2024/09/18/1104015/here-are-all-the-ai-bills-in-congress-right-now/.

bodies released the "AI Measures" in August 2023, which became the first set of administrative regulations for generative AI services. These regulations are designed to ensure the safe and responsible use of AI in China, setting clear guidelines for companies developing AI technologies.[43]

Meanwhile, Brazil is also moving towards AI regulation with Bill No. 2,338/2023, although no specific AI laws exist yet.[44] Existing laws, such as the General Data Protection Law and Consumer Protection Code, may influence AI development in Brazil, pushing for a balance between innovation and user protection. In India, while specific AI laws are still lacking, the country is formulating regulatory frameworks, including the National Strategy for AI (2018) and Principles for Responsible AI (2021), to guide ethical AI development and implementation across sectors. In the UK, the government has chosen not to implement horizontal AI regulation but instead promotes a "principles-based framework" for sector-specific regulators to apply to AI development. The UK might later introduce a statutory duty on regulators to adhere to these principles after assessing the non-statutory phase, emphasizing a gradual, adaptable approach to AI governance.[45]

This shows that each country's approach to AI regulation reflects its socio-political context and the urgency to address AI's rapid advancement while balancing innovation with ethical concerns. Legislative measures, like those in the United States, focus on specific AI-related bills. Framework-based approaches, like those adopted by the UK, offer flexibility by allowing sector-specific regulators to interpret and apply regulations. Strategic and ethical guidelines, as seen in Brazil and India, emphasize responsible AI development and ethical considerations. Indonesia, lacking specific AI laws, and no current effort in formulating regulatory frameworks, faces challenges in keeping pace with AI's rapid growth. While there are no specific AI laws yet, existing regulations, such as the Personal Data Protection Law, Information and Electronic Transactions Law, Copyright Law, and Consumer Protection Law, may influence AI development. Thus, for Indonesia, given these characteristics, it is crucial to strengthen its legal and regulatory infrastructure by developing a comprehensive, cohesive AI policy that addresses ethical concerns, privacy protection, and governance.[46]

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[43] Irina A. Filipova, "Legal Regulation of Artificial Intelligence: Experience of China," *Journal of Digital Technologies and Law* 2, no. 1 (2024): 52.

[44] Oswaldo Pereria de Lima Junior, Prabhpreet Singh, and Albin Anto, "From Ethics to Action: An Analysis of Ai Public Policies in Brazil and India," In *International Conference on Smart Systems: Innovations in Computing*, pp. 765, (Singapore: Springer Nature Singapore, 2023), 775.

[45] AI Watch, *Global Regulatory Tracker*, New York: White & Case, n.d, https://www.whitecase.com/insight-our-thinking/ai-watch-global-regulatory-tracker#home.

[46] Zuiderwijk, Anneke, Yu-Che Chen, and Fadi Salem, "Implications of the use of artificial intelligence in public governance: A systematic literature review and a research agenda," *Government information quarterly* 38, no. 3 (2021): 101579.

In addition, regarding AI risks, various government agencies and global AI organizations are taking proactive steps to manage the risks associated with AI innovation, involving parties such as the Council of the European Union, NIST, and ministries in China, Japan, and South Korea.[47] These efforts focus on mitigating risks, particularly the cybersecurity challenges arising from AI use. International bodies such as the European Union Cybersecurity Agency are working to develop strategies to systematically identify and manage AI risks. Furthermore, leading AI companies, such as Google, Microsoft, and OpenAI, are contributing to the development of safer and more trustworthy AI systems.[48] For Indonesia, the implications of these global efforts are significant. The country must formulate concrete policies and regulations for AI implementation, addressing the potential risks, especially in cybersecurity and ethics. Given the limitations in infrastructure and resources, collaboration between the government, the private sector, and international organizations is crucial to building a resilient security system. Indonesia must also adapt AI regulations to fit its social, economic, and cultural context, while prioritizing ethical principles such as transparency and the protection of personal data. Additionally, increasing human resource capacity in AI is essential to addressing the challenges at hand.

4. Conclusion

Artificial Intelligence (AI) in governance has the potential to transform public services by improving transparency, accountability, and responsiveness. AI's ability to analyze large datasets and autonomously make decisions can enhance public administration, as evidenced by successful implementations in many developed economies. However, the rapid advancement of AI presents both opportunities and challenges, particularly for public administration, where it can improve efficiency but also pose risks related to data misuse and breaches. Thus, the need for a robust governance framework that addresses data protection and risk management is urgent.

The absence of clear regulations on AI ethics, data privacy, and governance further exacerbates concerns, making it essential for Indonesia to establish robust legal and ethical frameworks to ensure AI's responsible and transparent

[47] Department for Science, Innovation & Technology, "*Cyber Security Risks to Artificial Intelligence*," May 15, 2024.

[48] Giovanni Apruzzese et al., "The role of machine learning in cybersecurity," *Digital Threats: Research and Practice* 4, no. 1 (2023): 31. See also, Miles Brundage et al., "The malicious use of artificial intelligence: Forecasting, prevention, and mitigation," *arXiv preprint arXiv* 14, no. 3 (2018): 139. See also, Toby Shevlane et al., "Model evaluation for extreme risks," *arXiv preprint arXiv* 19, no. 2 (2023): 23.

implementation in the public sector. To mitigate AI risks in government services while balancing innovation, citizens' rights, and data security, Indonesia must establish a clear regulatory framework focused on data privacy, ethical AI use, and transparency. Strengthening data protection laws, addressing the shortage of skilled AI professionals, and improving infrastructure are critical steps to ensure the safe and responsible deployment of AI. By aligning with international best practices and fostering collaboration between the government, private sector, and global organizations, Indonesia can build a resilient, trustworthy AI ecosystem that prioritizes citizen rights and security.

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