ASIAN DIGITAL GOVERNANCE PROBLEMS

e-ISSN 3048-0868 (online)

Volume 1, Issue 2 2024
Page 88-102

https://doi.org/10.71435/685956

# AI-Based Public Service Transformation: An Analysis of Algorithmic Bias Risks and Digital Government Accountability in ASEAN

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**ARTICLE INFO**

**Received: 22 August 2024**
**Revised: 27 October 2024**
**Accepted: 02 December 2024**
**Available online: 12 December 2024**

**Keywords:**
AI Governance
Algorithmic Bias
Asean Countries
Public Trust

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ABSTRACT

***Purpose**: This study examines the risks of algorithmic bias and the challenges of digital government accountability in AI-based public service transformation across ASEAN countries. The research focuses on how governance structures, institutional capacity, and citizen participation influence the ethical implementation of AI in public administration.*

***Subjects and Methods:** The study employed a qualitative comparative multi-case study approach involving Singapore, Indonesia, Malaysia, Thailand, and the Philippines. Data were collected through semi-structured interviews with 25 participants, policy document analysis, and comparative case studies. Thematic analysis using NVivo 14 was applied to identify patterns related to algorithmic bias, accountability mechanisms, and public trust.*

***Results:** The findings reveal that algorithmic bias remains a major challenge due to unequal datasets, fragmented regulation, and weak institutional oversight. Countries with stronger governance systems demonstrated higher transparency and accountability in AI implementation. Public trust was strongly influenced by citizen participation and transparency practices.*

***Conclusions:** Ethical governance, institutional coordination, and inclusive participation are essential to ensure fair, transparent, and accountable AI-based public services in ASEAN countries.*

## INTRODUCTION

The rapid evolution of digital technologies has significantly influenced the transformation of public services, particularly within the context of digital government (Lindgren & van, 2018; Margetts, 2008). Governments across the ASEAN region are increasingly adopting Artificial Intelligence (AI) technologies to enhance the efficiency, accessibility, and quality of public services. From automated citizen service portals to predictive analytics in law enforcement, AI-based solutions are being integrated into government systems to optimize decision-making and streamline public sector processes. This transformation is not only changing how governments operate but also how citizens interact with government institutions.

As AI systems become embedded in the very fabric of public service delivery, they offer the promise of more efficient, personalized, and inclusive services (Poudel, 2024; Makhdum, 2024; Latupeirissa et al., 2024). However, as this digital transformation progresses, it also brings forth a new set of challenges that need to be addressed to ensure that the application of AI in public services does not inadvertently perpetuate inequality or harm marginalized groups.

Recent studies have shown that algorithmic decision-making systems, while efficient, are not immune to biases that may arise during their development and implementation. Algorithmic bias, the phenomenon wherein machine learning algorithms produce results that are systematically prejudiced due to flawed data or human influence in the training process, is a growing concern within the public sector (Kordzadeh & Ghasemaghaei, 2022; Packin & Lev-Aretz, 2018). These biases may exacerbate existing inequalities, leading to discriminatory outcomes in public services such as healthcare, social benefits, and policing.

For example, AI systems used in hiring or criminal justice may inadvertently discriminate against certain demographic groups if trained on biased historical data. Therefore, the issue of algorithmic bias in AI-based public services is of paramount importance, particularly in the context of ASEAN countries, where social, cultural, and economic diversity presents both opportunities and challenges for equitable AI implementation (Mahusin et al., 2024; Isono & Prilliadi, 2023).

As the implementation of AI-based solutions in public services expands, the issue of accountability in digital government becomes increasingly critical (Al-Ansi et al., 2024). Digital government accountability refers to the responsibility of public sector institutions to ensure that the deployment of AI technologies aligns with ethical standards, legal frameworks, and societal values. In ASEAN, where governance structures vary significantly across member states, ensuring digital government accountability in AI deployment becomes a complex task.

Governments must not only ensure that AI technologies are deployed ethically but also that they remain transparent and accountable to the citizens they serve. Public trust in AI-driven services is crucial for their long-term success, and the lack of accountability mechanisms may undermine the effectiveness of digital governance initiatives. Without robust accountability frameworks, citizens may lose confidence in AI technologies, hindering their potential to transform public services positively.

The primary research problem addressed in this study is the risk of algorithmic bias and the challenge of ensuring accountability in the implementation of AI technologies in ASEAN public services. While AI has the potential to enhance the efficiency and effectiveness of public sector services, the presence of bias and the lack of accountability mechanisms may undermine the benefits these technologies offer. In the context of ASEAN, where diverse socio-political environments and varying degrees of technological infrastructure exist, the implementation of AI-based solutions in public services poses a unique set of challenges.

These challenges need to be addressed through comprehensive frameworks that ensure AI technologies are developed and deployed in ways that are fair, transparent, and accountable. In the search for solutions to these issues, previous research offers several insights. Scholars have proposed that reducing algorithmic bias requires diverse and representative data, as well as transparent AI development processes that involve multiple stakeholders, including ethicists, data scientists, and the communities affected by these technologies.

Another potential solution lies in the establishment of independent regulatory bodies that can oversee the deployment of AI in public services, ensuring that the technologies meet ethical and legal standards. Additionally, literature highlights the importance of fostering digital literacy among citizens to increase their understanding of AI technologies and empower them to hold government institutions accountable for their use. By adopting these approaches, governments can work towards mitigating the risks associated with AI-based decision-making and enhancing the accountability of digital governance.

While there is a growing body of literature on algorithmic bias and digital government accountability, research specific to the ASEAN region remains sparse. Much of the existing scholarship has focused on Western contexts, where regulatory frameworks and societal structures differ significantly from those in ASEAN countries. The diversity of the ASEAN region, both in terms of its political systems and technological infrastructure, necessitates a region-specific approach to addressing the risks associated with AI-based public service transformation.

This gap in the literature calls for more localized research that considers the unique challenges and opportunities in ASEAN member states.

This study aims to fill this gap by analyzing the risks of algorithmic bias and exploring the mechanisms for ensuring digital government accountability in the context of AI implementation in ASEAN public services. The novelty of this research lies in its focus on the ASEAN context, where AI deployment in public services is still in the early stages compared to other regions, providing an opportunity to develop frameworks that are both regionally relevant and adaptable. By investigating the current state of AI-based public services in ASEAN countries, this research seeks to provide practical recommendations for addressing the risks of algorithmic bias and strengthening accountability in digital government systems.

The scope of this study is to examine case studies from several ASEAN nations, drawing comparisons between countries with varying levels of AI adoption and regulatory maturity. Through this exploration, the study aims to contribute to the broader conversation on digital government and AI ethics by providing insights that can help policymakers and practitioners navigate the complex landscape of AI implementation in public services. It also seeks to offer a comprehensive framework that can be adapted to different ASEAN contexts, ensuring that AI technologies are deployed in ways that promote fairness, transparency, and accountability in the delivery of public services.

## METHODOLOGY

### Research Design

This study employed a qualitative research design using a comparative multi-case study approach to examine the risks of algorithmic bias and the implementation of digital government accountability in AI-based public service transformation across ASEAN countries. A qualitative approach was considered appropriate because the research focused on understanding institutional practices, governance dynamics, policy interpretations, and stakeholder perceptions regarding the deployment of Artificial Intelligence (AI) in public administration. Qualitative inquiry enables researchers to explore complex socio-technical phenomena in depth and within their contextual settings, particularly when issues of ethics, governance, and accountability are closely intertwined with political and institutional realities (Creswell & Poth, 2018; Flick, 2022). The study was grounded in an interpretivist paradigm, emphasizing how actors within government institutions, civil society organizations, and digital governance agencies interpret and respond to AI-related risks in public services. This paradigm was selected because the implementation of AI in governance cannot be separated from social values, institutional cultures, and administrative structures that differ among ASEAN member states. In this context, interpretivism provides flexibility to capture diverse perspectives and institutional experiences concerning transparency, accountability, and fairness in AI governance.

A comparative case study framework was adopted following Yin (2018), allowing systematic comparison across multiple ASEAN countries with varying levels of digital governance maturity. The selected countries were Singapore, Indonesia, Malaysia, Thailand, and the Philippines. These countries were chosen purposively because they represent different stages of AI policy development, institutional readiness, and public sector digitalization. Singapore was selected as a model of advanced AI governance and institutional coordination, whereas Indonesia and the Philippines represented emerging digital governance environments characterized by fragmented regulatory systems. Malaysia and Thailand were included to provide intermediate perspectives regarding institutional adaptation and AI governance reforms in Southeast Asia. The comparative approach enabled the study to identify both convergent and divergent patterns related to algorithmic bias, institutional accountability, and public trust. Through this design, the research aimed to generate context-sensitive explanations regarding how governance structures influence the ethical implementation of AI in public services within the ASEAN region. The methodological structure of the study is presented in Figure 1.

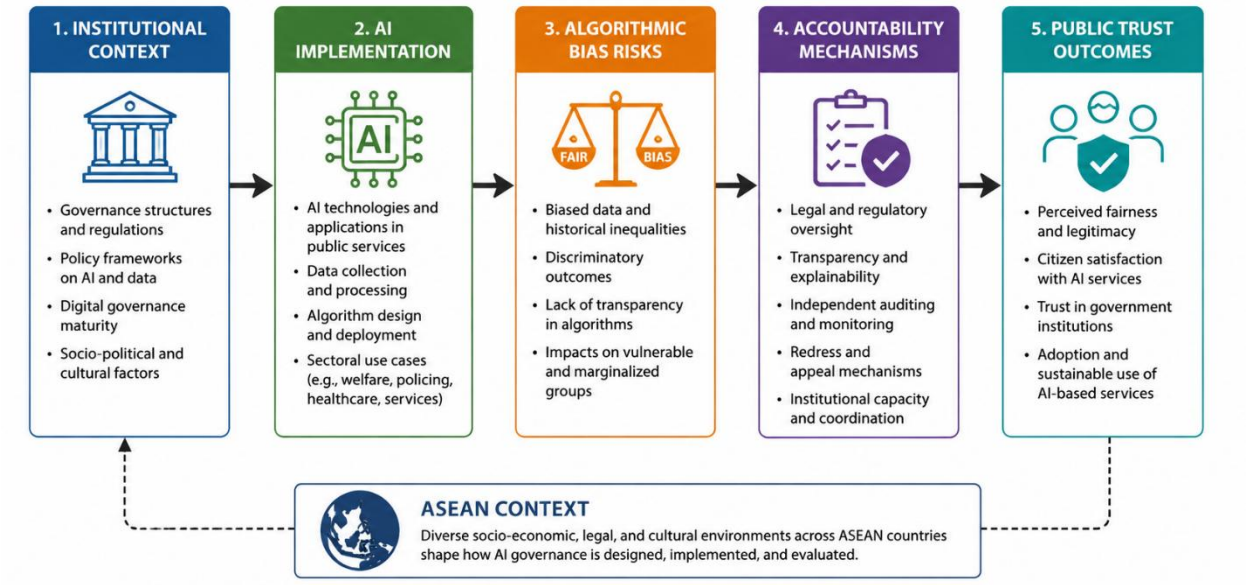


**Figure 1.** Research Design Framework of AI Governance Analysis in ASEAN Public Services

The framework illustrates the analytical relationship between institutional governance structures, AI deployment practices, accountability systems, and citizen trust in public services.

## Research Context and Location

The research was conducted within the context of digital government transformation in ASEAN public administration systems. The study focused on five ASEAN member states: Singapore, Indonesia, Malaysia, Thailand, and the Philippines. These countries were selected because they demonstrate varying levels of AI integration into public service delivery, regulatory maturity, and institutional capacity for digital governance. Singapore represents one of the most advanced AI governance ecosystems in Southeast Asia, supported by comprehensive frameworks such as the Model AI Governance Framework developed by the Infocomm Media Development Authority (IMDA). Meanwhile, Indonesia and the Philippines continue to experience challenges related to fragmented institutional coordination, limited regulatory oversight, and insufficient public engagement mechanisms. Malaysia and Thailand occupy transitional positions, where AI adoption in government services is increasing but institutional accountability systems remain under development. The research context included AI applications in several sectors of public service delivery, including welfare administration, predictive policing, healthcare services, and digital citizen platforms. These sectors were selected because they directly involve algorithmic decision-making processes that potentially affect citizens' rights, access to services, and perceptions of governmental fairness. By situating the research within these diverse governance environments, the study was able to examine how socio-political structures, administrative traditions, and digital capacities shape AI governance outcomes across ASEAN countries.

## Data Sources and Data Collection Techniques

This study utilized both primary and secondary data sources to ensure comprehensive understanding and analytical triangulation. Primary data were obtained through semi-structured interviews with stakeholders involved in digital governance and AI policy implementation. Semi-structured interviews were selected because they allow flexibility in exploring participants' experiences while maintaining consistency across interview themes (Patton, 2015). The interviews focused on participants' perceptions regarding algorithmic bias, institutional accountability, transparency mechanisms, and public trust in AI-based public services. The interview process was conducted between April and September 2024. Interviews were undertaken online and offline depending on participants' availability and geographical location. Each interview lasted approximately 45 to 90 minutes and was recorded with participants' consent to ensure accuracy in transcription and interpretation. Interview guidelines were designed based on themes derived from previous studies on AI governance, algorithmic accountability, and digital ethics (Wieringa, 2020; OECD, 2021).

Secondary data consisted of policy documents, AI governance frameworks, government reports, legal regulations, white papers, and institutional publications related to AI implementation in ASEAN public services. Documents from international organizations such as the OECD, UNESCO, ASEAN Secretariat, and World Bank were also reviewed to strengthen contextual understanding. Peer-reviewed journal articles, conference proceedings, and think-tank reports were analyzed to support theoretical interpretation and comparative analysis. Document analysis enabled the researcher to examine formal institutional commitments and compare them with empirical findings obtained from interviews. The combination of interviews and document analysis allowed the study to capture both official policy narratives and practical implementation realities within ASEAN digital governance systems. This triangulated approach strengthened the depth and credibility of the findings.

**Informants and Sampling Technique**

The study employed purposive sampling to select informants with direct knowledge and experience related to AI governance and public sector digitalization. Purposive sampling is appropriate in qualitative research because it prioritizes information-rich participants who can provide detailed insights into the phenomenon under investigation (Creswell & Poth, 2018). A total of 25 informants participated in the study. The participants included government officials from ministries responsible for digital transformation, technology agency officers, AI ethics specialists, public policy experts, law enforcement analysts, civil society activists, and digital rights advocates. These participants were selected because of their active involvement in designing, implementing, regulating, or evaluating AI systems in public administration. The distribution of informants across countries was designed to ensure balanced comparative perspectives. Participants from Singapore largely represented institutional governance and AI regulatory agencies, while participants from Indonesia and the Philippines provided insights into implementation challenges and regulatory fragmentation. Informants from Malaysia and Thailand contributed perspectives regarding transitional governance reforms and policy adaptation. To complement purposive sampling, snowball sampling was also utilized during the data collection process. Several initial informants recommended additional participants with expertise in specific areas such as predictive policing systems, AI ethics auditing, and citizen participation in digital governance. This strategy enabled the researcher to access specialized networks and obtain richer contextual information relevant to the study objectives.

**Data Analysis Technique**

Data analysis was conducted using thematic analysis supported by NVivo 14 qualitative analysis software. Thematic analysis was selected because it allows systematic identification, organization, and interpretation of recurring patterns within qualitative data (Saldaña, 2021). The analysis process followed several stages consisting of data transcription, coding, categorization, thematic interpretation, and comparative synthesis. First, all interview recordings were transcribed verbatim to preserve the authenticity of participants' responses. The transcripts and policy documents were then imported into NVivo 14 to facilitate coding and organization of qualitative data. During the initial stage, open coding was applied to identify key concepts and recurring issues related to algorithmic bias, institutional accountability, transparency, citizen engagement, and digital trust. Second, axial coding was conducted to group related codes into broader thematic categories. Several major themes emerged from the analysis, including "bias in AI datasets," "institutional fragmentation," "transparency mechanisms," "ethical oversight," and "citizen participation." These themes were continuously compared across case countries to identify similarities and differences in governance practices. Selective coding was employed to integrate the themes into a coherent analytical narrative aligned with the theoretical framework of algorithmic accountability and digital governance maturity. Cross-case comparison enabled the researcher to examine how institutional structures and governance capacities influence the implementation and regulation of AI systems in public services. The analytical process remained iterative throughout the study, allowing continuous refinement of interpretations based on emerging findings and contextual evidence.

## Validity and Reliability

To ensure the trustworthiness and rigor of the study, several strategies were applied to establish credibility, dependability, confirmability, and transferability. First, data triangulation was conducted by comparing findings from interviews, policy documents, academic literature, and institutional reports. The use of multiple data sources reduced the risk of bias and strengthened the consistency of interpretations. Second, member checking was employed by sharing selected interpretations and summaries with several participants to confirm the accuracy of the researcher's understanding. This process helped ensure that participants' perspectives were represented appropriately and reduced potential misinterpretation of interview data. Third, peer debriefing was conducted through discussions with academic colleagues and researchers specializing in digital governance and AI ethics. These discussions provided critical feedback regarding coding consistency, thematic categorization, and analytical interpretation. Peer review also strengthened analytical objectivity by challenging potential researcher assumptions. Finally, an audit trail was maintained throughout the research process, documenting interview procedures, coding decisions, analytical memos, and interpretation development. This documentation enhanced the transparency and dependability of the research process, allowing future researchers to understand how findings were generated and interpreted. Through these validation strategies, the study aimed to maintain methodological rigor while producing credible and contextually grounded insights regarding AI governance and public service transformation in ASEAN countries.

## RESULTS AND DISCUSSION

This section presents the findings of the study regarding the implementation of Artificial Intelligence (AI) in public service transformation across selected ASEAN countries. The results are derived from semi-structured interviews with policymakers, digital governance experts, civil society actors, and public sector technology practitioners, supported by policy document analysis and comparative case studies. The findings are organized into three major themes based on the analytical framework used in this study: (1) algorithmic bias risks in AI-based public services, (2) institutional accountability mechanisms in digital governance, and (3) citizen engagement and public trust toward AI implementation. The presentation of findings emphasizes how institutional structures, governance capacity, and transparency practices influence the effectiveness and ethical implications of AI deployment in ASEAN public administration systems. To strengthen analytical interpretation, interview excerpts are complemented with comparative data tables summarizing the dominant patterns identified across the five countries studied. All qualitative findings are based on interview transcripts collected between April and September 2024 and supported by policy documents from national digital governance institutions and international organizations.

## Algorithmic Bias Risks in AI-Based Public Services

The findings indicate that algorithmic bias remains one of the most significant challenges in the implementation of AI systems within ASEAN public services. Across the five countries examined, the study identified recurring concerns related to biased datasets, unequal representation of marginalized groups, and lack of transparency in algorithmic decision-making. Although AI systems were introduced to improve administrative efficiency and policy accuracy, several cases demonstrated that technological systems frequently reproduced existing social inequalities embedded in historical data.

In Malaysia, interview participants emphasized that AI systems used in welfare distribution often generated inaccurate eligibility assessments for rural populations. The data used to train the system predominantly reflected urban socio-economic conditions, resulting in unequal allocation outcomes. This situation illustrates how biased training datasets can directly affect policy implementation and social justice outcomes.

> *"At first the system looked efficient, but when we checked the results, a lot of rural families were missing. The data mostly came from cities, so the AI read poverty differently. That's where the real problem started."* (Participant 07 – Government Welfare Officer, Malaysia)

The interview findings were supported by policy documents indicating that Malaysia's public sector AI systems still lack mandatory fairness auditing mechanisms before deployment. Consequently, the implementation process remains vulnerable to data imbalance and unequal representation of demographic groups.

A similar pattern emerged in the Philippines, particularly regarding predictive policing systems. Participants explained that law enforcement agencies relied heavily on historical crime data that already contained socio-economic biases. As a result, AI-generated risk assessments repeatedly targeted low-income neighborhoods, reinforcing discriminatory surveillance practices.

> *"The system keeps pointing to the same communities every time. Most of those areas are poor districts, and people there feel unfairly watched. The AI only follows old police records, so the bias just repeats itself."* (Participant 12 – Law Enforcement Analyst, Philippines)

The findings suggest that predictive AI technologies in law enforcement may unintentionally institutionalize historical discrimination when governance oversight remains weak. This result aligns with broader concerns regarding automated decision-making systems that reproduce structural inequalities within public institutions.

In contrast, Singapore demonstrated relatively stronger institutional safeguards to reduce algorithmic bias. Government agencies implemented regular AI audits and ethical review mechanisms under the national Model AI Governance Framework. Participants noted that algorithmic transparency and demographic testing had become mandatory procedures for AI systems operating in sensitive sectors such as healthcare and welfare administration.

> *"Before any AI system goes public, we run internal fairness checks first. We look at demographic balance, data quality, and hidden risks too. The process is not always perfect, but at least there's institutional control."* (Participant 03 – AI Ethics Specialist, Singapore)

The findings indicate that Singapore's governance approach prioritizes preventive oversight rather than reactive correction. Institutional coordination between technology agencies and regulatory bodies contributes to stronger accountability structures during AI deployment.

Table 1. Major Algorithmic Bias Risks in ASEAN Public Services

| Country | AI Sector | Main Bias Issue | Impact Identified | Source of Data |
|---|---|---|---|---|
| Singapore | Welfare & Healthcare | Limited real-time oversight | Potential demographic imbalance | Interview & Policy Documents |
| Indonesia | Public Administration | Inconsistent data integration | Unequal service access | Interview Data |
| Malaysia | Welfare Distribution | Urban-centered datasets | Rural exclusion from benefits | Interview Data |
| Thailand | Transportation & Health | Limited audit standards | Weak transparency mechanisms | Interview & National Strategy |
| Philippines | Predictive Policing | Historical policing bias | Discriminatory targeting | Interview Data |

*Source: Interview Data and Policy Document Analysis (2024)*

The table demonstrates that algorithmic bias risks differ depending on institutional maturity, sectoral implementation, and governance capacity. Countries with more centralized governance systems tend to possess stronger monitoring mechanisms, whereas fragmented institutional structures increase vulnerability to biased AI outcomes.

**Institutional Accountability Mechanisms in Digital Governance**

The second major finding concerns the uneven development of institutional accountability mechanisms across ASEAN countries. The study found that digital accountability in AI governance depends heavily on the presence of clear regulatory frameworks, institutional coordination, transparency procedures, and independent oversight systems.

Singapore emerged as the most institutionally prepared country among the cases examined. The government has established comprehensive AI governance guidelines requiring explainability, transparency, and external auditing procedures for public sector AI systems. Participants emphasized that accountability is embedded into policy implementation through mandatory documentation and ethical review processes.

> *"Every agency has to explain how the AI system actually works. We document the datasets used, the decision model, and risk factors. Public institutions can't deploy AI without going through those steps."* (Participant 02 – Government Technology Agency Official, Singapore)

The findings suggest that accountability mechanisms in Singapore are institutionalized through formal administrative procedures. Transparency requirements strengthen public sector responsibility while reducing uncertainty regarding AI decision-making.

Indonesia continues to face institutional fragmentation in AI governance. Interview participants highlighted the absence of a centralized authority responsible for regulating AI systems across government agencies. Different ministries operate independently without standardized ethical oversight procedures.

> *"Right now, almost every government institution is developing or implementing its own AI-based system separately, depending on their administrative needs and technological capacity. The problem is that there is still no centralized authority specifically responsible for supervising how these AI systems are designed, tested, or implemented in the public sector. Some agencies are already moving very quickly because they want to improve efficiency and accelerate digital services, but the regulatory framework is still lagging behind technological development. In practice, this creates a situation where institutions establish their own standards regarding data use, algorithmic transparency, and ethical considerations. We also rarely see independent audits or formal evaluations before these systems are deployed. As a result, accountability becomes unclear because there is no unified mechanism to determine who is responsible when bias, discrimination, or system errors occur in public services."* (Participant 15 – Ministry Official, Indonesia)

The absence of integrated governance structures creates inconsistencies in accountability practices. Participants further explained that institutional overlap often delays policy coordination and weakens regulatory enforcement regarding algorithmic transparency. The Philippines demonstrated similar accountability challenges due to decentralized governance arrangements. Several interviewees stated that AI systems are often implemented without comprehensive ethical evaluation or public consultation. The lack of national AI legislation contributes to inconsistent governance standards across regions.

> *"Some local agencies have already started using AI systems in public services, especially for administrative decisions and monitoring citizen-related data. The problem is that there's still no strong mechanism to evaluate the impacts. Public consultation is also very limited, so citizens rarely know how AI is used. In many cases, ethical review procedures are almost never formally conducted. The regulations remain too broad and vague, which allows institutions to interpret accountability standards differently. Because of that, each agency tends to create its own operational rules, and the level of oversight becomes uneven."* (Participant 18 – Technology Policy Advocate, Philippines)

Thailand occupies an intermediate position in terms of accountability development. While the country has initiated AI governance reforms through the National AI Strategy, implementation

remains largely procedural and lacks detailed enforcement mechanisms. Participants noted that accountability discussions are increasingly recognized within policy discourse, but institutional operationalization remains limited.

Table 2. Institutional Accountability Mechanisms in ASEAN AI Governance

| Country | Regulatory Framework | Audit Mechanism | Transparency Practice | Institutional Coordination |
|---|---|---|---|---|
| Singapore | Comprehensive | Strong | High | Centralized |
| Indonesia | Limited | Weak | Moderate | Fragmented |
| Malaysia | Developing | Moderate | Moderate | Transitional |
| Thailand | Emerging | Limited | Moderate | Partially Coordinated |
| Philippines | Weak | Minimal | Low | Decentralized |

*Source: Interview Data and Government Policy Documents (2024)*

The findings demonstrate that institutional maturity significantly influences accountability performance. Countries possessing centralized governance structures and formal AI strategies are more capable of integrating ethical safeguards into public sector digitalization processes.

**Citizen Engagement and Public Trust in AI Governance**

The third major finding concerns the relationship between citizen participation, transparency, and public trust in AI-based public services. The study found that public trust is closely associated with the extent to which governments involve citizens in AI governance discussions and provide transparency regarding automated decision-making systems.

Singapore showed relatively high levels of institutional trust due to consistent public consultation and transparent communication practices. Government agencies regularly organize digital governance forums and citizen education initiatives to improve public understanding of AI technologies.

> *"People here usually know when the government introduces AI systems into public services because there are usually public discussions and consultation forums held before implementation begins. Citizens are given opportunities to ask questions directly about how the technology works, what kinds of data are being collected, and how decisions are made by the system. The government also tries to explain the risks and benefits in a more open way, so people do not feel that AI is something completely hidden from public oversight. In our experience, transparency is important because citizens tend to trust digital systems more when they understand the purpose behind them and feel included in the process. Even though not everyone fully understands the technical side of AI, the openness of the process helps reduce suspicion and creates a stronger sense of institutional trust toward public service innovation."* (Participant 05 – Government Policy Officer, Singapore)

The findings indicate that transparency and public communication reduce perceptions of AI as an opaque or uncontrollable system. Public engagement strengthens institutional legitimacy and supports broader acceptance of digital transformation policies.

In Indonesia and the Philippines, however, public trust remains relatively fragile. Participants explained that many citizens are unaware that AI technologies are already integrated into public service systems. The limited availability of public consultation mechanisms contributes to skepticism and uncertainty regarding AI governance.

> *"Most people don't even realize some services already use AI systems. The government rarely explains it clearly, so citizens become more suspicious. Without transparency and participation, trust becomes difficult to build."* (Participant 21 – ICT Policy Advocate, Indonesia)

Participants further emphasized that low digital literacy levels also influence public trust dynamics. In several cases, AI systems are perceived as distant technological instruments controlled exclusively by government institutions and technical experts.

Thailand demonstrated moderate public trust levels, although participants highlighted the absence of institutionalized citizen participation mechanisms. Public engagement efforts remain limited to policy campaigns and pilot consultation programs rather than systematic governance practices. Table 3 summarizes the comparative patterns of citizen engagement and public trust identified across ASEAN countries.

Table 3. Citizen Engagement and Public Trust in AI Governance

| Country | Public Consultation | Citizen Awareness | Transparency Level | Public Trust |
|---|---|---|---|---|
| Singapore | Strong | High | High | High |
| Indonesia | Limited | Moderate | Low | Fragile |
| Malaysia | Moderate | Moderate | Moderate | Transitional |
| Thailand | Emerging | Moderate | Moderate | Moderate |
| Philippines | Weak | Low | Low | Fragile |

*Source: Interview Data and Comparative Analysis (2024)*

The findings suggest that trust in AI governance is not determined solely by technological efficiency but also by the quality of state society relations. Governments that prioritize transparency, communication, and citizen participation tend to achieve stronger public legitimacy in digital governance initiatives.

The results demonstrate that the implementation of AI in ASEAN public services remains deeply shaped by institutional governance capacity, regulatory maturity, and citizen participation mechanisms. While countries such as Singapore have established relatively comprehensive accountability structures, several ASEAN member states continue to face significant challenges related to algorithmic bias, fragmented regulation, and limited public engagement. These findings indicate that the future sustainability of AI-based public services in ASEAN depends not only on technological advancement but also on the development of ethical governance systems capable of ensuring fairness, transparency, and public trust.

## Discussion

### *Algorithmic Bias as a Structural Challenge in ASEAN Public Services*

The findings demonstrate that algorithmic bias in ASEAN public services is closely related to structural inequalities embedded within institutional data systems and governance practices. The qualitative evidence reveals that AI technologies do not operate as neutral administrative instruments, but rather reproduce existing socio-economic disparities reflected in historical datasets and bureaucratic procedures. This finding supports the argument developed by Kordzadeh and Ghasemaghaei that algorithmic systems inherit bias from the social environments in which data are produced and processed. In the ASEAN context, unequal data representation between urban and rural populations significantly influences the quality and fairness of automated decision-making processes (Kuziemski & Misuraca, 2020; Kim et al., 2024).

The case of welfare distribution in Malaysia illustrates how biased datasets can marginalize vulnerable communities when public institutions rely excessively on urban-centered administrative records. AI systems designed to improve efficiency may unintentionally exclude rural populations because algorithmic models interpret social vulnerability through incomplete demographic indicators (Abarca-Alvarez et al., 2019; Varela, 2024; Park & Humphry, 2019). This condition indicates that technological efficiency without representational fairness may intensify administrative inequality. The findings reinforce Eubanks (2018) perspective that automated governance systems frequently reproduce patterns of exclusion already present within public institutions.

The results from the Philippines also demonstrate that predictive policing technologies may strengthen discriminatory surveillance practices when institutional safeguards remain weak. Historical crime data used in algorithmic systems reflected pre-existing socio-economic bias, causing

repeated targeting of marginalized communities. In this context, AI functions not only as a technical tool but also as a mechanism capable of institutionalizing historical discrimination through automated processes. The study therefore confirms that algorithmic bias should be understood as a governance problem involving ethical, political, and administrative dimensions rather than merely a technical programming issue.

Singapore's experience indicates that institutional oversight mechanisms can reduce algorithmic risks when fairness auditing and transparency procedures are integrated into policy implementation. The existence of mandatory internal audits and demographic testing demonstrates how institutional accountability contributes to mitigating discriminatory outcomes in AI systems. These findings align with Wieringa (2020) concept of algorithmic accountability, which emphasizes the importance of explainability, oversight, and institutional responsibility in automated governance systems. The comparison between countries also indicates that institutional maturity strongly influences the ability of governments to identify and manage algorithmic bias risks before systems are fully implemented in public services.

### *Institutional Accountability and Governance Capacity in AI Implementation*

The study reveals substantial differences in institutional accountability mechanisms across ASEAN countries, particularly regarding regulatory coordination, ethical oversight, and transparency standards. The findings suggest that successful AI governance depends less on technological sophistication alone and more on the institutional capacity of governments to regulate, supervise, and evaluate digital systems systematically. Countries with centralized governance structures and formal AI frameworks demonstrate stronger accountability performance compared to states with fragmented institutional arrangements.

Singapore represents a model of coordinated digital governance in which accountability procedures are embedded within administrative structures. The implementation of the Model AI Governance Framework reflects a preventive governance approach emphasizing transparency, explainability, and ethical review before AI systems are deployed. Public institutions are required to document datasets, decision models, and risk mitigation procedures, allowing stronger institutional control over automated decision-making processes. This finding supports Bryson et al. (2014) argument that governance effectiveness depends on institutional coordination and collaborative administrative capacity.

Turner et al. (2022), Dauvergne (2018) and Fortnam et al. (2022) said that, indonesia and the Philippines continue to experience fragmented governance arrangements that weaken accountability enforcement. The absence of centralized regulatory authorities creates inconsistencies in AI implementation standards across ministries and agencies. Institutional fragmentation also limits the development of unified ethical guidelines and supervisory mechanisms. As identified in interview findings, several agencies independently determine operational standards without sufficient external oversight. This condition creates administrative uncertainty regarding legal responsibility when AI systems produce discriminatory or harmful outcomes.

Thailand and Malaysia demonstrate transitional governance conditions in which governments have initiated policy development but still face operational limitations in implementing accountability mechanisms. Existing national AI strategies provide broad policy direction, yet technical guidelines for audits, ethical evaluation, and enforcement remain underdeveloped. The findings indicate that regulatory formalization alone is insufficient without institutional operationalization and inter-agency coordination.

The comparative analysis confirms that accountability mechanisms are strongly influenced by governance maturity and bureaucratic capacity. Countries capable of integrating ethical principles into administrative procedures demonstrate greater readiness to manage AI-related risks. Conversely, weak institutional coordination increases the likelihood of inconsistent implementation, policy fragmentation, and limited public oversight. This finding reinforces OECD perspectives emphasizing that digital transformation requires institutional adaptation alongside technological innovation.

### *Citizen Engagement and Public Trust in AI Governance*

The findings demonstrate that citizen engagement plays a central role in shaping public trust toward AI-based public services. Trust is not generated solely through improvements in administrative efficiency, but through transparency, participation, and communication between governments and citizens. The study reveals that countries prioritizing public consultation and openness in AI governance tend to experience stronger public acceptance of digital transformation initiatives.

Singapore's governance approach illustrates how participatory mechanisms contribute to institutional legitimacy. Public forums, consultation processes, and citizen education initiatives allow communities to understand how AI systems operate and how decisions are made within public services. This transparency reduces perceptions of AI as an inaccessible or opaque technological system controlled exclusively by bureaucratic institutions. The findings align with digital governance literature emphasizing that citizen participation strengthens democratic accountability and policy legitimacy in technology-driven governance systems.

The conditions observed in Indonesia and the Philippines indicate that limited public engagement contributes to skepticism and fragile institutional trust. Many citizens remain unaware that AI systems are already integrated into public administration processes, particularly in sectors involving automated data analysis and service allocation. The absence of transparent communication mechanisms creates uncertainty regarding data use, algorithmic fairness, and government accountability. Interview findings suggest that citizens often perceive AI technologies as distant administrative tools imposed through top-down governance approaches rather than participatory public innovations (Yigitcanlar et al., 2021; Akopian et al., 2024; Lu & Sidortsov, 2019).

The study also identifies digital literacy as an important factor influencing public trust. In contexts where citizens possess limited understanding of AI systems, governments face greater challenges in establishing legitimacy and reducing public suspicion. Public trust therefore depends not only on institutional transparency but also on the ability of governments to improve public understanding of digital governance processes. This finding supports previous research arguing that technological governance requires active citizen inclusion to prevent democratic deficits in digital public administration.

Thailand's experience reflects an intermediate condition in which awareness regarding citizen participation is increasing, although formal engagement mechanisms remain limited. The findings indicate that institutional willingness to involve citizens has not yet been fully translated into operational governance structures. Public consultation remains largely symbolic rather than systematically integrated into policy formulation and implementation processes.

The discussion demonstrates that public trust in AI governance emerges from the interaction between transparency, participation, and institutional accountability. Governments capable of creating inclusive governance environments tend to achieve higher levels of social legitimacy in digital transformation initiatives. In contrast, weak communication and limited citizen involvement increase perceptions of opacity and reduce confidence in automated public service systems.

### *Digital Governance and the Future of AI-Based Public Service Transformation in ASEAN*

The study confirms that the future sustainability of AI-based public service transformation in ASEAN depends on the integration of technological innovation with ethical governance structures and institutional accountability systems. The findings demonstrate that AI implementation cannot be separated from broader political, social, and administrative contexts shaping governance capacity in each country. Technological advancement alone does not guarantee fair or accountable public service delivery when institutional safeguards remain weak.

The comparative analysis highlights that-countries with mature governance systems are better positioned to balance efficiency objectives with ethical considerations. Institutional coordination, regulatory clarity, and transparency mechanisms allow governments to minimize risks associated with algorithmic bias and administrative opacity. Countries lacking these governance capacities face greater vulnerability to discriminatory outcomes, fragmented accountability, and declining public trust (Samaratunge & Alam, 2021; Agu et al., 2024; Brezzi et al., 2021).

The findings also indicate that ASEAN countries remain at different stages of digital governance development (Apriliyanti et al., 2021; Priharsari et al., 2023; Sukarno & Nurmandi, 2023). Singapore has established relatively comprehensive institutional mechanisms, while Indonesia, the Philippines, Thailand, and Malaysia continue to navigate transitional governance environments characterized by evolving policy frameworks and uneven administrative capacities. These differences suggest that regional AI governance strategies must remain context-sensitive rather than adopting uniform regulatory models across ASEAN member states.

The study contributes to discussions on digital governance by demonstrating that AI governance in developing and transitional contexts involves multidimensional challenges extending beyond technical implementation. Ethical oversight, citizen participation, institutional maturity, and socio-political inclusion emerge as equally important dimensions in determining the effectiveness of AI-based public service transformation. The success of digital government initiatives in ASEAN therefore depends on governments' ability to combine technological capacity with transparent, participatory, and accountable governance systems capable of protecting public trust and social justice.

## CONCLUSION

The implementation of AI-based public services in ASEAN countries is shaped not only by technological capacity but also by the strength of institutional governance, accountability mechanisms, and citizen participation. The findings reveal that algorithmic bias remains a significant challenge, particularly in countries with fragmented regulatory systems and limited oversight, where AI systems risk reproducing existing social inequalities. Countries with stronger governance structures, such as Singapore, show greater capacity to integrate transparency, ethical review, and institutional accountability into digital transformation processes. The study also finds that public trust in AI governance is strongly influenced by transparency and citizen engagement, as limited public participation often generates skepticism toward automated decision-making systems. These findings indicate that the sustainability of AI-driven public service transformation in ASEAN depends on the integration of ethical governance, regulatory coordination, and inclusive public participation to ensure that digital innovation supports fairness, accountability, and social legitimacy in public administration.

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