Multidisciplinary Output Research For Actual and International Issue (MORFAI Journal) ISSN (e): 2808-6635
Volumes 6 No. 1 (2026)

AI READINESS AND MATURITY ASSESSMENT FOR ETHICAL AND RESPONSIBLE AI ADOPTION: A CASE STUDY OF PT SARANA MULTI INFRASTRUKTUR

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Received	: 29 October 2025	Published	: 26 December 2025
Revised	: 20 November 2025	DOI	: https://doi.org/10.54443/morfai.v6i1.4493
Accepted	: 10 December 2025	Publish Link	: https://radjapublika.com/index.php/MORFAI/article/view/4493

Abstract

This study assesses the readiness and maturity level of PT Sarana Multi Infrastruktur (SMI), a state-owned development finance institution in Indonesia, for ethical and responsible artificial intelligence (AI) adoption. Employing a mixed-methods approach, the research integrates the Technology-Organization-Environment (TOE) framework, Technology Readiness Index (TRI), and IBM AI Adoption Maturity Model to evaluate AI readiness across multiple dimensions. Data were collected through questionnaires distributed to 84 employees with minimum five years of tenure and semi-structured interviews with five key stakeholders representing IT, Risk Management, Human Capital, Compliance & Legal divisions, and executive management. Results reveal high individual psychological readiness (TRI score: 3.61, Explorers classification) with strong optimism and innovativeness, yet critical institutional gaps in governance frameworks, data infrastructure, security protocols, and regulatory compliance mechanisms. PT SMI is classified at Phase 1, Initial Experiments of the IBM maturity model. Strategic recommendations include establishing comprehensive AI governance frameworks aligned with Indonesian regulations (PDP Law, SE Kominfo No. 9/2023, OJK AI Ethics), strengthening data and security foundations, and building employee risk awareness. This research provides actionable roadmap for responsible AI adoption in public sector financial institutions navigating digital transformation amid regulatory constraints.

Keywords: AI readiness assessment, AI governance, development finance institution, TOE framework, technology readiness index

INTRODUCTION

The rapid advancement of Artificial Intelligence (AI) technology has transformed organizational operations across global industries, evolving from theoretical concepts to integral components of daily business processes (Hind et al., 2020; Steyvers et al., 2024). According to a survey conducted by McKinsey in March 2025, AI adoption in the United States increased significantly, with 78% of organizations utilizing AI in at least one business function, compared to 55% in the previous year. The economic implications are substantial, with the McKinsey Global Institute (2023) projecting that AI implementation could contribute up to USD 4.4 trillion annually to the global economy, positioning AI as one of the most economically impactful technologies of this decade. In Indonesia, AI's transformative potential is estimated to contribute approximately 12% to national GDP growth, equivalent to USD 366 billion by 2030 (Portal Informasi Indonesia, 2024). The Indonesian government has formulated the National Digital Economy Strategy in December 2023, identifying AI ecosystem development as a central pillar, alongside the National Artificial Intelligence Strategy 2020-2045, which outlines four focus areas: ethics and policy, talent development, infrastructure and data, and research and innovation (Novita & Yulia, 2024). Within the Ministry of Finance (MoF), AI adoption has gained urgency due to the negative growth policy, recruiting fewer employees than those retiring while managing increasing workloads (JDIH Kemenkeu, 2021). This necessitates what Gartner (2024) terms a "productivity revolution" through Generative AI and Intelligent Applications, with the MoF implementing AI solutions including Law Analyzer, SmartBot JDIH, and AsistenKeu (Kemenkeu Learning Center, 2025). PT Sarana Multi Infrastruktur (SMI), a State-Owned Enterprise under the Ministry of Finance operating as a Development Finance Institution (DFI), plays a crucial role in accelerating national infrastructure development through financing, consulting, and project development services. In its 2024-2028 long-term business plan (RJPP) themed "Next Gen IT & Analytics," PT SMI has identified AI implementation as critical for delivering transformational solutions across administration reporting, knowledge management, document synthesis, credit

decisioning, and contract lifecycle management (RJPP 2024-2028). However, PT SMI's current AI utilization remains limited to informal exploration and research, with employees potentially using open AI tools without formal governance frameworks or security protocols. This gap presents significant concerns given PT SMI's handling of sensitive financial data, client information under Non-Disclosure Agreements, and strategic infrastructure project details. The absence of AI governance presents multifaceted risks extending beyond operational inefficiencies to encompass legal compliance, data security, and ethical considerations. The Personal Data Protection Law (PDP Law No. 27 of 2022) mandates data controllers to ensure security, confidentiality, and legality throughout data management processes. The Ministry of Communication and Information Technology Circular Letter (SE Kominfo) Number 9 of 2023 concerning AI Ethics emphasizes principles of fairness, accountability, and transparency, requiring organizations to establish clear accountability mechanisms and periodic auditing systems for AI adoption. The Financial Services Authority (OJK) AI Code of Ethics Guidelines (2023) reinforces requirements for human-centricity, transparency, accountability, and security in AI implementation. These regulatory frameworks underscore the critical need for PT SMI to develop robust AI governance before scaling its AI initiatives.

The urgency of this assessment is further emphasized by concerns raised by PT SMI leadership. According to the head of the Risk Management division in the IT committee meeting (2025), issues of data privacy, data security, and governance of AI use present significant challenges when employees upload data to AI, especially open-source AI, as confidential company information can be exposed and misused. Additionally, AI technology has the potential to produce biased results, resulting in unfair or discriminatory decisions (Ferrara, 2024). Without proper governance frameworks, PT SMI faces risks including data security breaches, regulatory non-compliance, and lack of accountability for AI-assisted decisions, risks especially relevant considering employee use of open AI tools like ChatGPT, Google Gemini, and DeepSeek for work purposes without clear oversight or policies. This study aims to assess the AI readiness and maturity level of PT Sarana Multi Infrastruktur through a comprehensive evaluation framework addressing governance, ethical compliance, and security dimensions. Specifically, this research seeks to: (1) identify and select an appropriate framework for assessing AI adoption maturity at PT SMI; (2) identify gaps, risks, and areas requiring improvement in PT SMI's AI adoption planning; and (3) provide strategic recommendations for developing AI governance frameworks that align with organizational needs and regulatory requirements. These objectives respond to the urgent need for PT SMI to evaluate its preparedness for implementing safe, ethical, and responsible AI as a crucial first step in formulating internal policies and ensuring successful digital transformation aligned with the Ministry of Finance's AI development roadmap for 2025-2027.

This research contributes to both theoretical and practical domains. Theoretically, this study extends the application of AI maturity assessment frameworks to Indonesian development finance institutions, integrating international governance principles with Indonesian regulatory requirements including the PDP Law, SE Kominfo on AI Ethics, and OJK AI Code of Ethics Guidelines. This contextually appropriate assessment approach addresses an underexplored area in existing literature regarding AI readiness evaluation in public sector financial institutions operating in emerging economies. Practically, this research provides PT SMI with actionable insights regarding its current AI maturity level and specific recommendations for developing internal AI governance policies. The findings offer a roadmap for responsible AI adoption that balances innovation with risk management, addressing critical concerns related to data security, regulatory compliance, ethical decision-making, and accountability. As PT SMI operates under the Ministry of Finance's digital transformation agenda and serves as a model for other Special Mission Vehicles, the governance framework and recommendations generated from this research can inform broader AI adoption strategies across Indonesia's public financial sector.

This study employs a qualitative case study methodology, utilizing surveys and interviews with PT SMI employees across multiple departments to comprehensively assess organizational readiness for AI implementation. The assessment framework evaluates key dimensions including technological infrastructure, organizational culture, data governance capabilities, ethical awareness, security protocols, and regulatory compliance readiness. This approach enables identification of specific gaps and challenges in PT SMI's current AI adoption planning, providing a foundation for evidence-based recommendations tailored to the organization's unique context as a development finance institution. The practical implications of this research are substantial for multiple stakeholders. For PT SMI, this study provides a baseline assessment of AI maturity that informs the development of comprehensive governance frameworks aligned with the 2024-2028 long-term business plan's Next Gen IT & Analytics initiative (PT Sarana Multi Infrastruktur, 2024). The recommendations address immediate priorities including establishing AI usage policies, implementing secure AI tool approval processes, developing employee training programs on AI ethics and security, and creating oversight mechanisms for monitoring AI applications in critical business functions such as credit decisioning and financial analysis. For policymakers and other Indonesian public sector organizations, this

research demonstrates a replicable methodology for assessing AI readiness and highlights common challenges faced by institutions navigating tensions between AI-driven efficiency gains and responsible governance requirements. As Indonesia advances its National Artificial Intelligence Strategy 2020-2045, the insights from this study contribute to understanding how development finance institutions can adopt AI technologies while maintaining public trust, regulatory compliance, and ethical standards essential for sustainable digital transformation in the public financial sector.

LITERATURE REVIEW

Artificial Intelligence and Generative AI

Artificial Intelligence refers to computational systems performing tasks requiring human intelligence such as reasoning, learning, and decision-making (Russell & Norvig, 2021). Within organizational contexts, AI is increasingly deployed to support automation, improve analytical accuracy, and enhance operational efficiency. Generative AI represents a transformative shift, creating new content including text, images, and audio using algorithms like Generative Adversarial Networks, Transformers, and Diffusion Models (Feuerriegel et al., 2024). Popular applications include ChatGPT for text generation, DALL·E for images, and GitHub Copilot for code (Oluwagbenro, 2024). Studies reveal widespread adoption, with approximately 75% of users employing generative AI to automate work tasks and 63% reporting improved productivity (Salesforce, 2023; Conference Board, 2024). However, critical challenges persist. Hallucinations, where AI models generate information appearing correct but substantively inaccurate, can occur as high as 91% in some tasks with precision dropping to only 4-5% (Adel & Alani, 2025). Another critical threat stems from prompt injection attacks, which both NIST and the Alan Turing Institute classify as critical risks threatening AI system integrity (NIST, 2023; Turing Institute, 2024).

AI Applications and Governance

AI has fundamentally changed organizational contexts, functioning as a strategic component of digital transformation (Oluwagbenro, 2024). In the financial sector, AI supports fraud detection, credit scoring, risk prediction, and portfolio management. The EY report (2024) highlights how AI enables efficient financial infrastructure management through predictive analytics, while The World Bank (2023) emphasizes its urgency in complex financing portfolio analysis. Despite benefits, implementation faces challenges including cultural readiness, digital literacy, data security concerns, and lack of mature governance frameworks (Oluwagbenro, 2024). AI governance encompasses structures, policies, and control mechanisms ensuring ethical, legal, and regulatory compliance. In Indonesia, the Ministry of Communication and Informatics issued SE No. 9 of 2023, establishing ethical principles including inclusivity, security, accountability, transparency, and data protection for Electronic System Operators. OJK's 2023 AI Code of Ethics Guidelines emphasize beneficial, fair, transparent, and secure AI in financial services, aligning with Good Corporate Governance and Governance, Risk Management, and Compliance principles.

Theoretical Frameworks

The TOE Framework introduced by Tornatzky and Fleischer (1990) examines three factors for assessing organizational AI readiness (Narwane et al., 2019). Technological Factors encompass infrastructure availability, information system maturity, and capacity to integrate AI into business processes (Uren & Edwards, 2023; Jöhnk et al., 2021). Relative advantage refers to perceived benefits compared to existing technologies, driving adoption intention (Moharrak & Mogaji, 2025). Compatibility refers to alignment with organizational values, needs, and practices, with strong alignment increasing readiness (Hradecky et al., 2022). Security and trust refer to organizational confidence that technology can protect data and maintain integrity (Bertino et al., 2021; Yu & Carol, 2022). Organizational Factors encompass internal elements including top management commitment, organizational structure, and human resource readiness (Hradecky et al., 2022). Top management support is crucial because AI implementation requires clear direction, budget availability, and adequate resource allocation (Hassan et al., 2023). Without support, AI initiatives risk facing internal resistance and limited funding (Alsheibani et al., 2018). Organizational readiness encompasses capacity of structures, culture, and resources to enable technology integration, including competent workforce and robust governance frameworks (Shonubi, 2024). Environmental Factors refer to external influences including competitive pressures, regulatory changes, and government incentives (Jöhnk et al., 2021; Votto et al., 2021).

The Technology Readiness Index, introduced by Parasuraman (2000), measures individual tendencies to accept and use new technology. TRI emphasizes that technological readiness is determined by combinations of

psychological factors that encourage and inhibit adoption, updated from 36 items to 16 items for greater relevance (Parasuraman & Colby, 2015). TRI consists of four dimensions. Optimism represents positive views of technology and beliefs in its benefits. Innovativeness represents tendencies to be technology pioneers. Discomfort represents perceived lack of control and feelings of being overwhelmed. Insecurity represents distrust regarding security, privacy, and reliability. Optimism and innovativeness act as drivers, while discomfort and insecurity act as inhibitors (Parasuraman, 2000).

The IBM AI Adoption Maturity Model classifies organizational readiness into five evolutionary phases (IBM, 2023). Phase 1 or Initial Experiments involves limited AI use without clear strategy. Phase 2 or Appropriate Use sees AI used for specific needs with inconsistent processes. Phase 3 or Governance and Standardization establishes wider AI use with initial standards and ethical focus. Phase 4 or Scale and Optimization implements AI on large scales with performance monitoring and data-driven decision-making. Phase 5 or Full Integration and Innovation achieves wide integration with continuous innovation and mature governance.

This study integrates TOE, TRI, and IBM AI Adoption Maturity Model to comprehensively assess organizational AI readiness. TOE provides structures for understanding technological, organizational, and environmental factors but tends to be macro-scale (Hradecky et al., 2023). TRI complements by focusing on individuals' psychological readiness, providing specific indicators for measuring adoption readiness in terms of user behavior and attitudes (Parasuraman, 2000; Parasuraman & Colby, 2014). IBM's model emphasizes organizations' maturity levels in AI implementation journeys (IBM, 2023). This integration captures various readiness layers, with TOE and TRI analysis results determining organizational position within IBM AI maturity phases, providing characteristics and strategic recommendations for sustainable AI development.

METHOD

This study employs a mixed-methods approach combining quantitative and qualitative data to comprehensively assess PT SMI's readiness and maturity level for AI adoption (Matović & Ovesni, 2023). The research follows a sequential structure including literature review to establish theoretical foundation, quantitative data collection through questionnaires to assess readiness levels and identify maturity phase, qualitative data collection through semi-structured interviews to explore deeper findings and challenges, and integration of all findings to produce strategic recommendations. Primary data is obtained through interviews and questionnaires (Taherdoost, 2021), while secondary data includes internal documents, business plans, and government regulations relevant to AI governance.

The questionnaire targets PT SMI employees with more than five years of experience, assuming this group possesses deep understanding of organizational vision, mission, and culture. Of 412 total employees, 260 meet this criterion. Using the Slovin formula with 5% margin of error, the minimum sample size is 74 respondents from various divisions and organizational levels. Interview participants were selected using purposive sampling to represent TOE framework dimensions including Operations and Finance Director for organizational factors, IT Division for technology factors, Risk Division for risk management, Human Capital Division for employee capability, and Compliance and Legal Division for regulatory alignment.

The TRI questionnaire measures individual technology readiness through four dimensions including Optimism, Innovativeness, Discomfort, and Insecurity. Adapted from Parasuraman and Colby (2015), it uses a 5-point Likert scale with four items per dimension, totaling 16 items adapted to AI adoption context. The TOE questionnaire measures technological factors through Relative Advantage, Compatibility, and Security and Trust dimensions. Adapted from Alsheibani et al. (2020) and Nguyen et al. (2022), it uses the same 5-point Likert scale with three items per dimension. Semi-structured interviews explore TOE factors in depth, including technological, organizational, and environmental factors, along with strategic recommendations for strengthening AI governance.

Descriptive statistics are applied to questionnaire data. TRI data is analyzed by calculating average scores for each dimension to classify respondents into five segments including Pioneers, Explorers, Skeptics, Hesitators, and Avoiders. TOE data is analyzed to measure employee perceptions of technological factors. Combined results provide comprehensive quantitative measures forming the basis for determining maturity phase using the IBM AI Adoption Maturity Model. Interview transcripts are analyzed using interpretive analysis to identify recurring patterns and themes, and 5 Whys analysis to explore root causes of key findings. Data collection continues until saturation is reached (Creswell, 2019). The final phase combines findings from quantitative, qualitative, and secondary data through triangulation analysis, which increases confidence in research data by cross-verifying findings from multiple sources (Thurmond, 2001).

RESULTS AND DISCUSSION

Data Characteristics and Response Rate

The questionnaire was distributed to PT SMI employees at staff, team leader, and head of division levels, targeting a minimum of 74 respondents with five or more years of tenure. The final response yielded 84 completed questionnaires, exceeding the target by 113%. Among the 84 respondents, gender distribution was balanced with 42 males and 42 females. The average working period was 8.5 years, well above the minimum five-year criterion. Regarding job positions, the sample comprised 72 staff members (85.71%), 10 team leaders (11.90%), and 2 heads of division (2.38%) from various divisions throughout PT SMI.

Technology Readiness Index (TRI) Assessment Results

The Technology Readiness Index assessment yielded a total TRI score of 3.61 for PT SMI employees. Referring to the classification developed by Parasuraman (2000; Parasuraman & Colby, 2014), a total score above 3.51 indicates that PT SMI employees have a high level of Technology Readiness in welcoming and adopting artificial intelligence (AI)-based initiatives. This high readiness is driven by the dominance of motivator dimensions, Optimism (1.02) and Innovativeness (0.98), which collectively outweigh inhibitor dimensions, Discomfort (0.87) and Insecurity (0.74).

Table 1. TRI Dimensional Scores

TRI Dimension	Score	Category	Classification
Optimism	1.02	Motivator	High
Innovativeness	0.98	Motivator	High
Discomfort	0.87	Inhibitor	High
Insecurity	0.74	Inhibitor	Low
Total TRI Score	**3.61**	**-**	**High**

The aggregate TRI score of 3.61 reflects strong psychological enablers for the organization to accept and adapt to AI implementation. However, the dimensional score pattern reveals an important imbalance. While Optimism and Innovativeness scores demonstrate employees' enthusiasm for AI adoption, the relatively high Discomfort score (0.87) compared to Insecurity (0.74) suggests that despite optimism and desire to innovate, employees still experience unease with new technologies, potentially due to perceived complexity or lack of system control. Analysis of each TRI dimension employed an empirical approach widely used in TRI-based research (Syamfithriani et al., 2021; Guntara et al., 2025), utilizing a 5-point Likert scale where average values above 3.00 are categorized as High (H), below or equal to 3.00 as Low (L), and above 4.00 as Very High (VH). The score pattern of High Optimism (H), High Innovativeness (H), High Discomfort (H), and Low Insecurity (L) theoretically classifies PT SMI's user segment as Explorers (H-H-H-L Pattern) according to the Parasuraman and Colby (2014) model. The Explorers group is characterized by high motivation to try and utilize new technologies but still experiences anxiety or frustration during the adoption process.

Technology Factor Assessment from TOE Framework

The quantitative analysis of technological factors within the Technology-Organization-Environment (TOE) framework focused on employees' internal perceptions of AI technology characteristics across three dimensions. These three variables represent the extent to which AI technology is perceived as beneficial, appropriate to the existing work context, and believed to be safe for use (Stjepić et al., 2021; Nguyen et al., 2022).

Table 2. TOE Technology Factor Scores

TOE Dimension	Average Score	Interpretation

Relative Advantage	4	Very High
Compatibility	3.79	High
Security and Trust	3.53	Moderate-High
Average TOE-T	3.77	High

All TOE-Technology Factor dimensions recorded average scores above 3.50, indicating overall positive employee perceptions that AI meets basic technology requirements for adoption. The Relative Advantage dimension's highest score (4.00) underscores very strong employee belief that AI adoption will bring tangible strategic and operational benefits to PT SMI. This finding aligns with Nguyen et al. (2022), asserting that relative advantage is the strongest determinant in driving digital technology adoption in transforming organizations. The Compatibility dimension's high score (3.79) indicates employees believe AI can be well integrated into PT SMI's current work environment, processes, and organizational culture, confirming findings of Stjepić et al. (2021) and Nguyen et al. (2022) that compatibility is a key factor in accelerating new technology adoption by reducing resistance and increasing user confidence. The Security and Trust dimension recorded the lowest score (3.53), while still above the neutral threshold (3.00), indicating perceived vulnerability regarding AI security and governance issues. This score aligns closely with the Low Insecurity finding (0.74) in TRI analysis, reinforcing that employees recognize AI security as the weakest aspect of PT SMI's technological readiness but are not psychologically overly concerned. According to Stjepić et al. (2021), security and trust risks often constitute major barriers to adopting new technology systems, especially in organizations with high-risk data.

Qualitative Analysis: Key Themes from Interviews

Semi-structured interviews were conducted with five key respondents: Director of Operations & Finance, Team Leader of IT Division, Team Leader of Human Capital Division, Team Leader of Risk Management Division, and Team Leader of Compliance & Legal Division. Interview transcripts were analyzed using thematic analysis approach to identify patterns and relationships between concepts.

Table 3. Thematic Analysis Summary

TOE Factor	Emerging Theme	Key Finding	Impact
Technological	Relative Advantage	AI perceived as efficiency and objectivity enabler	Strength
	Compatibility	AI aligns with existing systems if implemented gradually	Strength
	Security & Trust	Lack of governance limits safe integration	Weakness
Organizational	Top Management Support	Strong support but requires readiness prerequisites	Strength
	Managerial Obstacles	Policy and structural gaps slow decision-making	Weakness
	Organizational Readiness	High individual readiness, low institutional capacity	Weakness
Environmental	Government Regulations	Regulations guide cautious adoption approach	Strength
	Regulatory Ambiguity	Lack of AI-specific guidelines creates uncertainty	Weakness

Interview findings revealed consensus that AI offers significant benefits for improving efficiency and decision quality, particularly in automating repetitive tasks and supporting data-driven analysis. However, respondents consistently emphasized that PT SMI lacks formal governance structures. The absence of governance creates compliance risks and slows managerial decision-making, as emphasized by multiple respondents across divisions. This qualitative evidence corroborates quantitative findings showing relatively lower Security and Trust scores, suggesting that institutional-level preparedness lags behind individual-level enthusiasm.

Triangulation Analysis

Triangulation analysis combining questionnaire results, interview insights, and documentary evidence demonstrated strong consistency across data sources. Employees exhibit high psychological readiness (TRI score 3.61, Explorers classification) and perceive AI positively in terms of benefits and compatibility (TOE scores 4.00 and 3.79 respectively). However, qualitative data revealed critical gaps in organizational infrastructure, governance frameworks, and security protocols that quantitative measures did not fully capture. Internal documents confirmed absence of formal AI policies, while external regulations (PDP Law, SE Kominfo No. 9/2023, OJK AI Code of Ethics) establish compliance requirements that PT SMI must address before scaling AI initiatives. The triangulation reveals fundamental disconnect: individual readiness is high, but institutional preparedness remains at early stages, consistent with organizations in exploratory phases of technology adoption (Jöhnk et al., 2021; Hradecky et al., 2022).

Discussion

The assessment reveals a paradoxical condition at PT SMI: exceptionally high individual readiness coupled with critically low institutional preparedness. The TRI score of 3.61 places PT SMI employees in the high readiness category according to Parasuraman's classification (2000; Parasuraman & Colby, 2014), with the Explorers profile indicating strong motivation tempered by technical discomfort. This profile is particularly significant for development finance institutions, as it suggests employees recognize AI's strategic value but require structured support to overcome implementation anxiety. The high Optimism (1.02) and Innovativeness (0.98) scores demonstrate that PT SMI possesses crucial psychological capital for digital transformation, aligning with findings from Oluwagbenro (2024) that successful AI adoption requires not only technical capacity but also positive organizational attitudes toward technology.

However, the interpretation must consider the concerning pattern of high Discomfort (0.87) combined with low Insecurity (0.74). While Discomfort reflects healthy awareness of technical complexity requiring organizational support through training and user-friendly systems, the low Insecurity score presents a critical anomaly. In PT SMI's context as a Development Financial Institution managing sensitive infrastructure financing data and operating under strict regulatory oversight, low security concern among employees suggests insufficient risk awareness. This finding contradicts best practices in financial sector AI adoption, where security consciousness should be elevated (Bertino et al., 2021). The disconnect between low perceived risk and high actual risk exposure creates vulnerability to data breaches, regulatory violations, and reputational damage, particularly given employee access to open AI platforms without formal governance.

The TOE framework results further illuminate this readiness paradox. The very high Relative Advantage score (4.00) indicates employees clearly perceive AI's strategic benefits, consistent with Nguyen et al.'s (2022) assertion that perceived advantage is the strongest adoption driver. Similarly, the high Compatibility score (3.79) suggests employees believe AI can integrate into existing workflows without fundamental disruption, reducing anticipated resistance (Stjepić et al., 2021; Hradecky et al., 2022). However, the comparatively lower Security and Trust score (3.53), while still positive, reveals the institutional weakness that interview data extensively corroborated. This pattern suggests that PT SMI employees are psychologically ready and perceive AI as beneficial and compatible, yet simultaneously recognize, albeit without sufficient concern, that security infrastructure and governance mechanisms are inadequate.

The qualitative analysis reveals why high individual readiness has not translated into organizational adoption. Interview findings consistently identified absence of formal AI governance as the primary barrier, encompassing lack of policies, undefined roles, absent risk management frameworks, and unclear accountability structures. This governance vacuum creates what Alsheibani et al. (2018) and Hassan et al. (2023) describe as managerial obstacles, where leadership support exists in principle but cannot materialize into action due to structural inadequacy. PT SMI's prudential organizational culture, characteristic of financial institutions prioritizing risk management, paradoxically becomes both asset and constraint. While this culture ensures eventual AI adoption will be responsible and controlled, it simultaneously creates circular dependency: governance frameworks cannot be developed without organizational commitment, yet organizational commitment cannot be formalized without governance frameworks. The environmental dimension presents similar complexity. Government regulations including the Personal Data Protection Law (PDP Law No. 27/2022), Ministry of Communication and Information Technology Circular Letter (SE Kominfo) No. 9/2023, and OJK AI Code of Ethics Guidelines (2023) establish clear compliance expectations emphasizing transparency, accountability, fairness, and security. However, as Votto et al. (2021) observed in their study of regulatory impacts on technology adoption, general regulations without sector-specific implementation guidelines create interpretive ambiguity. Interview respondents from Compliance and Legal divisions emphasized

this challenge, noting that absence of AI-specific regulations for development finance institutions forces internal interpretation of broad principles, increasing legal uncertainty and slowing decision-making. This regulatory ambiguity, while frustrating for organizations seeking clarity, actually reflects appropriate regulatory caution given AI's rapidly evolving nature and inadequately understood long-term impacts (Kazim & Koshiyama, 2021). Based on comprehensive analysis, PT SMI's current position aligns with Phase 1, Initial Experiments of the IBM AI Adoption Maturity Model (IBM, 2023). This classification addresses the first research question regarding appropriate evaluation frameworks. The integration of TOE, TRI, and IBM maturity models proved highly effective in capturing multiple readiness dimensions, individual psychological factors through TRI, organizational and environmental factors through TOE, and developmental progression through IBM maturity phases. This multi-framework approach addresses limitations identified by Hradecky et al. (2023), who argued that single-framework assessments provide incomplete pictures of organizational readiness. The TOE framework's macro-level analysis effectively identified structural constraints, while TRI's individual-level focus revealed psychological readiness and user segmentation crucial for change management. The IBM maturity model then contextualized these findings within a developmental trajectory, clarifying that PT SMI's current state, characterized by informal experimentation without formal structures, is a recognized early stage rather than a problematic anomaly, provided the organization progresses toward establishing governance and standardized processes.

This methodological contribution is significant for emerging economy contexts where AI adoption research remains limited. While existing literature extensively documents AI readiness in developed economies (Jöhnk et al., 2021; Shonubi, 2024), less attention addresses public sector financial institutions in developing countries navigating simultaneous pressures of digital transformation mandates, resource constraints, and stringent regulatory requirements. The integrated framework approach demonstrates effectiveness in such complex contexts, providing nuanced understanding not achievable through single-dimensional assessment. Addressing the third research question, strategic recommendations must prioritize governance establishment before technical implementation. The first critical intervention involves developing comprehensive AI Governance Framework aligned with Indonesian regulatory requirements (PDP Law, SE Kominfo No. 9/2023, OJK AI Code of Ethics) and international best practices (OECD AI Principles, NIST AI Risk Management Framework). This framework should encompass formal policies defining acceptable AI use, ethics guidelines emphasizing transparency and accountability, clear role definitions using RACI matrix structures, AI risk assessment protocols, data handling standards including anonymization and access controls, and model documentation requirements ensuring auditability. Without this governance foundation, PT SMI's high individual readiness could paradoxically increase risk exposure rather than enabling beneficial innovation.

The second strategic pillar addresses technological and data infrastructure gaps. Interview findings revealed fragmented data systems and absent secure environments for AI experimentation, consistent with Phase 1 characteristics in the IBM model. Strengthening this foundation requires developing data governance standards, implementing data classification schemes distinguishing sensitive from public information, establishing secure AI sandbox environments for controlled testing, and enhancing cybersecurity infrastructure addressing AI-specific vulnerabilities. These technical interventions align with Bertino et al.'s (2021) and Yu and Carol's (2022) recommendations for building security and trust in AI systems through robust technical controls rather than relying solely on policy. The third pillar focuses on building employee capability and risk awareness to address the concerning low Insecurity scores. Comprehensive AI literacy programs should educate all employees on AI capabilities, limitations, and risks, with specialized training for technical staff on AI development and monitoring. Critically, risk and compliance awareness programs must specifically address data security implications of using open AI platforms with sensitive organizational data, transforming low security concern into appropriate vigilance. This educational approach aligns with Hassan et al.'s (2023) findings that successful AI adoption requires not only technical capability but also organizational learning and cultural adaptation.

These recommendations are structured as phased implementation roadmap respecting PT SMI's prudential culture while enabling measured progress. The phased approach, first establishing governance, then strengthening foundations, finally implementing pilot projects, ensures that enthusiasm documented through high TRI and TOE scores can be channeled into productive innovation rather than creating compliance violations or security breaches. This progression aligns with IBM's maturity model logic, where foundational elements must precede scaled implementation. For PT SMI specifically, this research provides actionable guidance for responsible AI adoption aligned with the 2024-2028 long-term business plan's Next Gen IT & Analytics initiative. The findings validate management's cautious approach while providing structured pathway to move beyond exploratory phase. For Indonesian public sector organizations and state-owned enterprises more broadly, this study demonstrates that high

employee enthusiasm for AI, while valuable, is insufficient without corresponding institutional capacity. The methodology offers replicable approach for assessing AI readiness in contexts prioritizing regulatory compliance, data sensitivity, and public accountability. For policymakers, findings highlight urgent need for sector-specific AI implementation guidelines for financial institutions and public entities. While current regulations establish sound ethical principles, operationalizing these principles requires more detailed guidance on acceptable AI use cases, data protection requirements, risk management approaches, and accountability mechanisms specific to different organizational contexts. Such guidance would reduce interpretive ambiguity currently slowing responsible innovation. Theoretically, this study contributes by demonstrating that AI readiness assessment requires multi-dimensional frameworks capturing individual, organizational, and environmental factors simultaneously. The finding that high individual readiness can coexist with low institutional preparedness challenges simplistic readiness models and highlights importance of triangulating quantitative perceptions with qualitative realities and documentary evidence. This methodological approach extends existing literature that often applies frameworks in isolation, providing more nuanced understanding of organizational readiness in complex institutional environments.

CONCLUSION

This study demonstrates that PT SMI's readiness to adopt Artificial Intelligence is determined not solely by technological capabilities but through complex interactions between psychological, structural, governance, and regulatory factors characteristic of development financial institutions. Through a mixed-methods approach combining TRI and TOE surveys, in-depth interviews, and documentary analysis, this research addresses three primary research questions. First, the integration of TOE, TRI, and IBM AI Adoption Maturity Model proved most relevant for assessing AI maturity, with TOE effectively capturing organizational and environmental dimensions crucial for highly regulated institutions, TRI revealing individual psychological readiness, and IBM contextualizing PT SMI's position at Phase 1, Initial Experiments. Second, analysis reveals PT SMI possesses strong psychological readiness (TRI score 3.61, Explorers classification) but faces critical structural challenges including absence of AI governance frameworks, data security and compliance concerns, unintegrated data infrastructure, and risk perception gaps between individual employees and organizational requirements. Third, strategic recommendations require three pillars: establishing comprehensive AI governance frameworks aligned with Indonesian regulations (PDP Law, SE Kominfo No. 9/2023, OJK AI Code of Ethics), strengthening data and security foundations, and building employee risk awareness capabilities.

The practical implications are substantial for multiple stakeholders. For PT SMI, this research provides actionable roadmap for responsible AI adoption aligned with the 2024-2028 long-term business plan's Next Gen IT & Analytics initiative, emphasizing phased implementation that respects the institution's prudential culture while enabling measured progress toward higher AI maturity. For Indonesian public sector organizations and state-owned enterprises, this study demonstrates replicable methodology for assessing AI readiness in contexts prioritizing regulatory compliance, data sensitivity, and public accountability. For policymakers, findings highlight urgent need for sector-specific AI implementation guidelines for financial institutions, as current regulations establish sound ethical principles but require more detailed operational guidance to reduce interpretive ambiguity currently slowing responsible innovation. Future research should include longitudinal studies tracking PT SMI's AI maturity progression, comparative studies examining AI readiness across similar development finance institutions in emerging economies, and implementation studies evaluating effectiveness of proposed governance frameworks in practice.

REFERENCES

Adel, A., & Alani, N. (2025). Can generative AI reliably synthesise literature? Exploring hallucination issues in ChatGPT. AI & Society, 1–14.

Adeoye-Olatunde, O. A., & Olenik, N. L. (2021). Research and scholarly methods: Semi-structured interviews. Journal of the American College of Clinical Pharmacy, 4(10), 1358–1367.

Ahnert, T., Doerr, S., Pierri, M. N., & Timmer, M. Y. (2021). Does IT help? Information technology in banking and entrepreneurship. International Monetary Fund.

Alsheibani, S., Cheung, Y., & Messom, C. (2018). Artificial intelligence adoption: AI-readiness at firm level. In PACIS 2018 Proceedings, Yokohama.

Bertino, E., Kantarcioglu, M., Akcora, C. G., Samtani, S., Mittal, S., & Gupta, M. (2021). AI for Security and Security for AI. In Proceedings of the Eleventh ACM Conference on Data and Application Security and Privacy (pp. 333–334).

Benbya, H., Davenport, T. H., & Pachidi, S. (2020). Artificial intelligence in organizations: Current state and future opportunities. MIS Quarterly Executive, 19(4).

BPPT. (2020). Strategi Nasional Kecerdasan Artifisial Indonesia 2020–2045. BPPT Press.

Chatterjee, S., Rana, N. P., Dwivedi, Y. K., & Baabdullah, A. M. (2021). Understanding AI adoption in manufacturing and production firms using an integrated TAM-TOE model. Technological Forecasting and Social Change, 170, 120880.

CNN Indonesia. (2023, December 22). Menkominfo rilis surat edaran soal etika AI, di-backup UU ITE dan PDP. https://www.cnnindonesia.com/…

Dwivedi, R., Nerur, S., & Balijepally, V. (2023). Exploring artificial intelligence and big data scholarship in information systems: A citation, bibliographic coupling, and co-word analysis. International Journal of Information Management Data Insights, 3(2), 100185.

Elliott, D., & Soifer, E. (2022). AI technologies, privacy, and security. Frontiers in Artificial Intelligence, 5, 826737.

Espina-Romero, L., et al. (2023). Which industrial sectors are affected by artificial intelligence? A bibliometric analysis of trends and perspectives. Sustainability, 15(16), 12176.

EY & FIDIC. (2024). How artificial intelligence can unlock a new future for infrastructure. EY.

Feuerriegel, S., Hartmann, J., Janiesch, C., & Zschech, P. (2024). Generative AI. Business & Information Systems Engineering, 66(1), 111–126.

Firman, H., Nuraini, R., & Sari, E. I. (2024, August 26). Membangun ekosistem AI di Indonesia untuk 2030: Potensi dan tantangan. Kementerian Keuangan. https://indonesia.go.id/…

Gangwar, H., Date, H., & Ramaswamy, R. (2015). Understanding determinants of cloud computing adoption using an integrated TAM–TOE model. Journal of Enterprise Information Management, 28(1), 107–130.

Hannoon, A., Al-Sartawi, A. M. M., & Khalid, A. A. (2021). Relationship between financial technology and financial performance. In The Big Data-Driven Digital Economy (pp. 337–344). Springer.

Hradecky, D., Kennell, J., Cai, W., & Davidson, R. (2022). Organizational readiness to adopt artificial intelligence in the exhibition sector in Western Europe. International Journal of Information Management, 65, 102497.

Jöhnk, J., Weißert, M., & Wyrtki, K. (2021). Ready or not, AI comes—An interview study of organizational AI readiness factors. Business & Information Systems Engineering, 63(1), 5–20.

Kazim, E., & Koshiyama, A. S. (2021). A high-level overview of AI ethics. Patterns, 2(9).

Kementerian Kominfo RI. (2023, December 19). Surat Edaran Menteri Kominfo Nomor 9 Tahun 2023 tentang Etika Kecerdasan Artifisial. https://jdih.komdigi.go.id/…

Matović, N., & Ovesni, K. (2023). Interaction of quantitative and qualitative methodology in mixed methods research. International Journal of Social Research Methodology, 26(1), 51–65.

McKinsey & Company. (2025, March 12). The state of AI: How organizations are rewiring to capture value. https://www.mckinsey.com/…

McKinsey Global Institute. (2023, June 2). The economic potential of generative AI: The next productivity frontier. https://www.mckinsey.com/…

Moharrak, M., & Mogaji, E. (2025). Generative AI in banking: Empirical insights on integration, challenges and opportunities in a regulated industry. International Journal of Bank Marketing, 43(4), 871–896.

Muhyi, H. A., Chan, A., Herawaty, T., Sukamadewi, R., & Kahfi, A. A. (2024). Organizational readiness for artificial intelligence: A systematic mapping study in public and private sectors. Universitas Padjadjaran.

Narwane, V. S., et al. (2019). Determinants of CloudIoT technologies adoption in Indian MSMEs. International Journal of Business Information Systems, 31(3), 322–353.

National Institute of Standards and Technology (NIST). (2023). AI security vulnerabilities: direct and indirect prompt injection.

Novita Sari, L., & Elvira, Y. (2024, March 10). Kerja sama internasional untuk pengembangan AI di Indonesia. Setkab. https://setkab.go.id/…

OJK. (2023). Panduan Kode Etik Kecerdasan Buatan (AI) yang Bertanggung Jawab dan Terpercaya di Industri Teknologi Finansial. Otoritas Jasa Keuangan.

Oluwagbenro, M. B. (2024). Generative AI: Definition, concepts, applications, and future prospects. Authorea Preprint.

Parasuraman, A. (2000). Technology Readiness Index (TRI). Journal of Service Research, 2(4), 307–320.

Parasuraman, A., & Colby, C. L. (2015). An updated and streamlined technology readiness index: TRI 2.0. Journal of Service Research, 18(1), 59–74.

PT Sarana Multi Infrastruktur (Persero). (2025). Rencana Jangka Panjang Perusahaan – Perubahan Tahun 2024–2028.

Rahma Salsabilla, A. (2025, February 11). Peran artificial intelligence dalam merumuskan kebijakan di Indonesia. Kementerian Keuangan. https://klc2.kemenkeu.go.id/…

Republik Indonesia. (2021). Peraturan Menteri Keuangan Republik Indonesia Nomor 87/PMK.01/2021… https://jdih.kemenkeu.go.id/…

Salam, R., Sinurat, M., Izzatussolekha, Y., Yasin, A., & Sacipto, R. (2023). Implementation of artificial intelligence in governance: Potentials and challenges. INFLUENCE: International Journal of Science Review, 243–253.

Salesforce. (2023, September 7). New AI usage data shows who's using AI. https://www.salesforce.com/…

Sekretariat Jenderal Kemenkeu. (2024, December). Wamenkeu Anggito Abimanyu: Belajar AI adalah perjalanan panjang. https://www.kemenkeu.go.id/…

Shonubi, O. A. (2024). Advancing organisational technology readiness for emerging technologies. International Journal of Technology and Globalisation, 9(1), 50–91.

teyvers, M., & Kumar, A. (2024). Three challenges for AI-assisted decision-making. Perspectives on Psychological Science, 19(5), 722–734.

Taherdoost, H. (2021). Data collection methods and tools for research. International Journal of Academic Research in Management, 10(1), 10–38.

The Conference Board. (2023, November 6). U.S. workers are embracing generative AI—but only 26% of companies have policies in place. https://www.conference-board.org/…

The Turing Institute. (2024). Indirect Prompt Injection: Generative AI's Greatest Security Flaw.

Uren, V., & Edwards, J. S. (2023). Technology readiness and the organizational journey towards AI adoption. International Journal of Information Management, 68, 102588.

Votto, A. M., Valecha, R., Najafirad, P., & Rao, H. R. (2021). AI in tactical human resource management: A systematic literature review. International Journal of Information Management Data Insights, 1(2), 100047.

World Bank. (2023). Digital Progress and Trends Report 2023. World Bank.

Yu, S., & Carroll, F. (2022). Implications of AI in national security. In Artificial Intelligence in Cyber Security (pp. 157–175). Springer.

Zhong, Y., Chen, Z., Ye, J., & Zhang, N. (2025). Critical success factors for digital transformation in the construction industry: Based on TOE framework. Engineering, Construction and Architectural Management, 32(6), 4227–4249.