

Received: 16 August 2025 **Revised:** 17 September 2025 **Accepted:** 22 September 2025

INNOVATION AGAINST CORRUPTION: A DIGITAL RISK-ASSESSMENT FRAMEWORK FOR REGIONAL GOVERNMENT IN THAILAND AND THE ASIAN CONTEXT

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(This article belongs to the Theme 2: Public Organization and Management in the Digital Age)

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Abstract

Corruption and misconduct remain persistent barriers to good governance in Thailand's regional government agencies, notably in procurement and licensing processes, thereby weakening fiscal discipline and public trust. This study, "Innovation Against Corruption," develops and evaluates a Natural Language Processing (NLP)-based digital risk-assessment framework to strengthen governance and reduce corruption risks. Utilizing a mixed-methods design, including online surveys of 160 officials, focus group discussions, and 24 in-depth interviews across four pilot provinces (Chiang Mai, Chainat, Ubon Ratchathani, and Trang), the research integrates NLP with a COSO-ERM-based risk matrix. Key findings reveal procurement as the highest-risk domain, reflecting structural vulnerabilities and entrenched patronage networks. The developed platform proved effective in automating risk scoring, reducing administrative burden, and enhancing transparency, with user feedback indicating high satisfaction with its usability, accuracy, and perceived benefits. This study significantly contributes to the digital governance and anti-corruption literature by linking technological innovation to the Sustainable Development Goals (SDGs) 16 (Peace, Justice, Strong Institutions), 9 (Industry, Innovation), and 11 (Sustainable Cities). It highlights the platform's pivotal role in fostering integrity, accountability, and public trust. Future research should address current limitations by expanding the geographical scope and exploring advanced technologies.

Keywords: Good Governance, Corruption Risk, Digital Platform, Natural Language Processing, Public Procurement

Citation Information: Chaokromthong, K., & Sinthao, N. (2025). Innovation Against Corruption: A Digital Risk-Assessment Framework for Regional Government in Thailand and the Asian Context. *Asian Political Science Review*, 9(2), Article 5. <https://doi.org/10.14456/apsr.2025.12>

Introduction

The central contribution of this study, "Innovation Against Corruption: A Digital Risk-Assessment Framework for Regional Government in Thailand and the Asian Context," lies in its pioneering integration of digital innovation into anti-corruption frameworks to strengthen good governance. Corruption has long been recognized as a persistent global threat, undermining sustainable development and eroding institutional trust worldwide. Data from Transparency International reveals that over two-thirds of countries score below 50 on a 0-100 scale in the Corruption Perceptions Index, signaling widespread governance deficits (Adam, 2024). The World Bank estimates the global economic cost of corruption at an alarming USD 2.6 trillion annually, approximately 5% of global GDP, while the United Nations Office on Drugs and Crime (United Nations Office on Drugs and Crime, 2023) emphasizes that corruption gravely undermines the rule of law, deters investment, and fractures social cohesion. The implications are particularly severe in Asia, where large-scale infrastructure projects, rapid urbanization, and complex public procurement systems create fertile ground for misconduct.

Thailand exemplifies these challenges acutely. Despite significant reforms initiated since the 1997 Constitution, which institutionalized sound governance principles in public administration, corruption remains pervasive across both national and provincial levels. Reports from the National Anti-Corruption Commission (2024) consistently highlight irregularities, particularly in procurement and licensing. The Organisation for Economic Co-operation and Development (2022) further stresses the urgent need for enhanced transparency, accountability, and civic engagement. At the provincial level, specific vulnerabilities such as discretionary authority, limited oversight, and entrenched patronage networks continue to erode fiscal discipline and weaken public trust. Concurrently, Thailand actively aligns its governance agenda with international benchmarks, particularly the United Nations Sustainable Development Goals (SDGs). SDG 16 (Peace, Justice, and Strong Institutions) explicitly mandates reducing corruption and bribery. Furthermore, SDG 9 (Industry, Innovation, and Infrastructure) and SDG 11 (Sustainable Cities and Communities) underscore the crucial role of innovation and accountable governance in national development. Thus, anti-corruption reforms are not merely a domestic imperative but also a core component of Thailand's global commitments.

In response to these pervasive challenges, technological innovation offers transformative opportunities. Digital platforms, e-procurement systems, and artificial intelligence (AI) applications are increasingly adopted globally to minimize human discretion, enhance transparency, and enable real-time monitoring of government operations. Successful international models, such as South Korea's OPEN system, Singapore's Smart Nation initiatives, and Indonesia's e-procurement reforms, demonstrate measurable reductions in corruption and improvements in service delivery. However, in Thailand, the integration of advanced technologies into anti-corruption strategies remains in its early stages, with substantial untapped potential.

This study directly addresses these challenges and opportunities by evaluating a Natural Language Processing (NLP)-based digital platform designed to assess corruption risks within regional government agencies under the Ministry of Interior. The platform operationalizes the robust risk management framework from the Committee of Sponsoring Organizations (2017). It utilizes DeLone and McLean's Information Systems Success Model (2003) to evaluate system effectiveness and user satisfaction. Through a mixed-methods approach applied across four pilot provinces, this research identifies corruption-prone domains, assesses the platform's performance, and analyzes user perceptions regarding its utility.

The initial results confirm that public procurement is the highest-risk domain, consistent with both Thai and international scholarship. Users reported high levels of satisfaction with the

platform's accuracy, transparency, and usability, indicating that technological tools can effectively complement institutional reforms by automating risk identification and providing objective evidence for decision-making. More broadly, these findings highlight Thailand's need to scale up digital anti-corruption initiatives, integrate them with existing oversight mechanisms, and embed them within national reform priorities and regional comparative experiences.

To achieve these aims, this study is guided by the following objectives:

- 1) To identify and analyze the primary corruption risks in regional government agencies under the Ministry of Interior.
- 2) To evaluate the effectiveness of an NLP-based digital platform in assessing and managing corruption risks, with reference to the Committee of Sponsoring Organizations (2017) framework.
- 3) To examine user satisfaction and adoption of the platform using DeLone and McLean's IS Success Model (2003).
- 4) To formulate targeted policy recommendations that strengthen good governance in Thailand and demonstrate broader applicability within the Asian context, consistent with the United Nations Sustainable Development Goals (SDGs).

Literature Review

Good Governance and Anti-Corruption Efforts in Thailand

The concept of good governance was formalized in Thailand following the 1997 Constitution, which explicitly mandated principles of transparency, accountability, efficiency, and participation in state administration. Subsequent constitutional frameworks and reform programs have consistently emphasized anti-corruption measures, with oversight bodies like the National Anti-Corruption Commission (NACC) playing a central role. However, empirical studies consistently reveal persistent challenges in translating these principles into practice, particularly at the regional and provincial levels, where implementation often falls short of national objectives.

Thai scholars have provided valuable insights into these dynamics. Sarnthoy (2019) highlights the efficacy of human resource management (HRM) practices—such as ethical training, merit-based promotion, and performance monitoring—in reducing misconduct within the Thai civil service. Kanyajit & Ketsil (2018) analyze the development and impact of anti-corruption networks, demonstrating that collaboration between local governments and civil society organizations can significantly strengthen external oversight and accountability. Furthermore, Kalyanamitra et al. (2018) identify leadership commitment, community participation, and organizational culture as decisive factors for successful anti-corruption efforts in local administrative organizations. Collectively, these studies underscore the foundational importance of institutional capacity, ethical norms, and robust stakeholder involvement in fostering a culture of good governance.

Despite these valuable contributions, a significant gap remains in Thai anti-corruption scholarship. While institutional and cultural dimensions have been extensively studied, the potential of advanced technologies to enable anti-corruption—particularly Natural Language Processing (NLP) and big data analytics—remains largely underexplored. Most existing reforms have primarily focused on procedural compliance and institutional strengthening, rather than systematically leveraging emerging digital tools to address corruption risks proactively.

Digital Innovation and ICT Governance in Anti-Corruption

A second significant body of literature emphasizes the transformative potential of digital technologies and e-government systems in enhancing governance. These systems achieve this by automating processes, reducing discretionary power, and improving transparency. Key

theoretical frameworks such as the Technology Acceptance Model (TAM) (Davis, 1989) and the Diffusion of Innovations Theory (Rogers, 2003) explain user adoption of Information and Communication Technology (ICT) systems. Furthermore, established frameworks such as those from the Committee of Sponsoring Organizations (2017) and DeLone and McLean's IS Success Model (2003) provide robust tools for evaluating risk management and system effectiveness, respectively.

Empirical evidence consistently supports the anti-corruption potential of digital platforms. Fazekas et al. (2016) demonstrate how procurement data can be used to develop a corruption risk index that systematically identifies "red flags." Lewis-Faupel et al. (2016) show that e-procurement systems in India and Indonesia have improved infrastructure delivery by reducing collusion and increasing competition. Nam (2018) further confirms that e-government initiatives have significant anti-corruption effects, although cultural norms and the existing levels of trust in institutions can moderate these effects.

However, the literature also cautions that technology alone is not a panacea for corruption. Neupane et al. (2012a, 2012b) find that while e-procurement can reduce opportunities for misconduct, its effectiveness is contingent upon complementary legal frameworks and robust institutional capacity. Similarly, Kim et al. (2009) attribute Korea's success to its OPEN (Online Procedures Enhancement for Civil Applications) system, citing strong political support and its integration into broader governance reforms. These findings collectively underscore that technological determinism is insufficient; digital tools must be embedded within supportive institutional environments to maximize their anti-corruption impact. For Thailand, this implies that the effectiveness of digital innovation hinges on its alignment with existing oversight mechanisms, such as the NACC's Integrity and Transparency Assessment (ITA), and its seamless integration with governance reforms at both central and provincial levels. The present study contributes to this literature by demonstrating how NLP-based tools can automate corruption risk assessment and by empirically testing user satisfaction with such a system.

Comparative Asian Experiences in Digital Governance

Drawing comparative lessons from other Asian countries provides valuable context for Thailand, given their similar institutional structures and development trajectories.

- 1) South Korea's OPEN System: This system is frequently cited as a pioneering example of e-government innovation. Making civil application status transparent online effectively reduced opportunities for bribery, limited discretionary authority, and fostered citizen trust (Kim et al., 2009).
- 2) Indonesia's e-Procurement Reform: Supported by the National Public Procurement Agency (LKPP), this reform introduced open bidding and real-time monitoring, thereby reducing corruption risks, enhancing competition, and improving cost-efficiency (Lewis-Faupel et al., 2016).
- 3) Singapore's Smart Nation Initiative: This initiative exemplifies how integrated digital systems, advanced data sharing, and predictive analytics can significantly enhance governance efficiency and reduce vulnerabilities, reflecting both technological sophistication and robust institutional frameworks.
- 4) India's Aadhaar Digital Identity Program: Despite some controversies, this program illustrates how digital platforms can effectively reduce leakages in welfare distribution by verifying beneficiary identities, thereby improving accountability.

These diverse cases highlight both the immense opportunities and inherent constraints of digital governance. Their success is not solely dependent on technological design but also on political will, administrative capacity, and cultural acceptance. For Thailand, these experiences underscore the importance of adapting digital governance systems to local

contexts, especially given the prevalent hierarchical structures and entrenched patronage networks within its provincial administration.

Identified Gaps and Conceptual Framework

Despite the insights from existing literature, significant gaps remain, particularly relevant to the Thai context:

- 1) Limited Exploration of Advanced Digital Technologies: Thai scholarship on anti-corruption primarily focuses on human resource management (HRM), networks, and cultural dimensions, with limited exploration of advanced digital technologies like NLP.
- 2) Inadequate ICT Adoption Models for Corruption-Specific Contexts: Existing ICT adoption theories do not adequately address corruption-specific contexts within hierarchical administrations.
- 3) Limited Cross-Asian Comparative Studies on Cultural Norms: Comparative Asian studies rarely examine how local cultural norms influence the adoption and effectiveness of digital platforms in anti-corruption efforts.

This study directly addresses these identified gaps by integrating the COSO-ERM framework with DeLone and McLean's Information Systems Success Model to evaluate an NLP-driven platform within Thailand's regional administration, while situating the analysis within the broader Asian experience.

Textual Conceptual Framework

This study links four key elements into a comprehensive conceptual framework: (1) an NLP-based platform that automates document analysis to produce a likelihood-by-impact risk matrix; (2) sound governance principles—transparency, accountability, participation, and rule of law—as the normative targets; (3) risk management based on the Committee of Sponsoring Organizations (2017) to standardize indicators across procurement, discretionary authority, and licensing; and (4) information systems success, evaluated via the DeLone & McLean (2003) model, encompassing system/information quality, user satisfaction, and net benefits. Together, these components connect digital innovation to measurable governance outcomes while minimizing subjective judgment.

Research Methodology

This study employed a mixed-methods research design to comprehensively investigate corruption risks in regional government agencies and evaluate the effectiveness of a digital risk-assessment platform. This approach combined quantitative and qualitative methods to capture both measurable patterns of corruption risks and nuanced stakeholder perceptions. The rationale for this design aligns with Creswell & Plano Clark (2017), who emphasize that integrating diverse data types strengthens the validity of findings through triangulation. The research process was systematically structured into four stages: (1) the development of the NLP-based digital platform, (2) pilot testing within selected provinces, (3) quantitative surveys to assess system performance and user satisfaction, and (4) qualitative interviews to gather in-depth insights.

Sampling Strategy and Participants

The study was conducted across four strategically selected provinces in Thailand, representing diverse administrative, economic, and demographic contexts. These provinces were chosen based on three key criteria: (1) the scale of their public procurement budgets, (2) their geographic diversity (spanning the North, Central, Northeast, and South regions), and (3) the expressed willingness of their provincial agencies to participate in the pilot project. This purposive sampling strategy ensured that the selected cases offered both variation and relevance to the research questions, allowing for a robust exploration of the study phenomena.

Within each participating province, two distinct groups of participants were targeted: (1) government officials directly involved in procurement, licensing, and approval processes, and (2) external stakeholders, including civil society representatives and local business actors. A total of 160 survey respondents participated in the quantitative phase, averaging approximately 40 participants per province. These respondents were selected through stratified random sampling from official staff rosters to ensure comprehensive representation across various departments. Complementing the quantitative data, 24 semi-structured interviews were conducted with key informants, purposively recruited for their critical roles in decision-making or oversight functions, to provide rich qualitative depth.

Instruments and Data Collection

The research employed three complementary instruments for data collection:

1) Digital Platform and Automated Risk Matrix: The core instrument was an NLP-based digital platform specifically developed to analyze official procurement and licensing documents. This platform was designed to code for risk indicators in accordance with the Committee of Sponsoring Organizations (2017) framework. It generated a real-time risk matrix that classified activities by likelihood and impact, thereby providing a quantitative measure of corruption risk across three critical domains: procurement, discretionary authority, and licensing.

2) Survey Questionnaire: A structured questionnaire was utilized to assess user satisfaction with the digital platform. The DeLone and McLean IS Success Model (2003) comprised items measuring perceptions of system quality, information accuracy, usability, and net benefits. Respondents rated each item on a five-point Likert scale, enabling quantitative analysis of system effectiveness. To ensure reliability and clarity, the questionnaire underwent pilot testing with 15 officials from a non-sample province, resulting in minor adjustments to the wording.

3) Semi-Structured Interviews: In-depth qualitative data were gathered through semi-structured interviews with 24 key informants. The interview guide focused on participants' perceptions of corruption risks, their experiences with the digital platform, and broader governance challenges. Example questions explored aspects such as "What types of procurement processes are most vulnerable to irregularities?" and "How could digital platforms complement existing oversight mechanisms?" Interviews typically lasted 60-90 minutes, were recorded with consent, and transcribed verbatim for subsequent thematic coding.

Ethical Considerations

Given the sensitive nature of researching corruption, strict ethical protocols were rigorously adhered to throughout the study. The research design was reviewed and approved by the Kasem Bundit University Research Ethics Committee (Approval No. KBU-REC-2023-045). Key ethical safeguards implemented included:

1) Informed Consent: All participants received comprehensive information sheets detailing the study's purpose, potential risks, and the voluntary nature of participation. Written consent was obtained from all participants prior to their involvement.

2) Confidentiality: Identifiable data were meticulously anonymized. Survey responses were coded numerically, and all interview transcripts were stored securely with restricted access to protect participant identities.

3) Minimization of Risk: Proactive measures were taken to minimize reputational or professional harm to participants. Sensitive questions were framed in general terms, and respondents could skip any question they felt uncomfortable answering.

4) Data Protection: All digital data collected was encrypted, and audio files were destroyed promptly following transcription to ensure maximum data security.

The study further adhered to the ethical guidelines stipulated by the Declaration of Helsinki for research involving human subjects, ensuring principles of respect, beneficence, and justice were upheld.

Data Analysis

Quantitative data obtained from the surveys were analyzed using descriptive and inferential statistics. Mean scores and standard deviations were computed for user satisfaction items. Additionally, ANOVA tests were conducted to assess variations in satisfaction across different provinces. The risk matrices generated by the digital platform were aggregated to facilitate comparative analysis of corruption risk levels across procurement, licensing, and discretionary authority domains.

Qualitative data from the semi-structured interviews were subjected to thematic coding. Following Braun & Clarke's (2006) six-step approach, transcripts were thoroughly reviewed, codes were generated, and overarching themes were identified. The generated themes and findings were rigorously validated through peer debriefing involving two independent researchers. Illustrative quotes from participants were selectively used to highlight nuanced perspectives on procurement challenges and perceptions of the platform's utility.

Reliability and Validity

Instrument quality was meticulously examined prior to full deployment. The survey instrument underwent expert review, demonstrating a content validity index (CVI) greater than 0.80 across all items. A small-scale pilot study (n=15) was conducted to refine wording and layout. Internal consistency in the main sample was satisfactory, with Cronbach's alpha values of 0.89 for system quality, 0.90 for information quality, 0.88 for usability, and 0.91 for net benefits. For qualitative data, credibility was enhanced through analyst triangulation and member checks with key informants. An audit trail meticulously documenting code evolution and decision logs was maintained to support the dependability and confirmability of the qualitative findings.

Research Findings

Automated Risk Assessment Results

The NLP-based platform was employed to analyze procurement, licensing, and discretionary authority documents across the four pilot provinces. Risk matrices were generated, classifying activities by likelihood and impact in accordance with the Committee of Sponsoring Organizations (2017) framework. The results consistently indicated that public procurement recorded the highest corruption risk scores, followed by discretionary authority, with licensing posing comparatively lower risks.

Table 1 Aggregated Mean Corruption Risk Scores by Domain (Scale: 0-10)

Domain	Likelihood (Mean)	Impact (Mean)	Risk Score (L × I)
Procurement	7.8	8.2	63.96
Discretionary Authority	6.1	6.8	41.48
Licensing & Approvals	5.4	6	32.4

These quantitative results strongly confirm that procurement is the most corruption-prone process within regional government. This high vulnerability is attributed to procurement contracts often involving substantial budgets, complex technical specifications, and intricate interactions between government agencies and private contractors, all of which heighten the potential for corruption. The significant fiscal impact of procurement risks underscores the urgency of targeted anti-corruption interventions in this domain.

User Satisfaction Survey

Survey responses from 160 officials provided comprehensive insights into user satisfaction with the digital platform. Measured across four dimensions derived from the DeLone and McLean IS Success Model (2003), user perceptions consistently indicated high levels of satisfaction:

- 1) System Quality: Respondents rated the platform highly for its stability, speed, and intuitive interface design, achieving a mean score of 4.3/5.
- 2) Information Accuracy: Users highly valued the platform's ability to generate objective, evidence-based risk scores, with a mean of 4.4/5.
- 3) Usability: The platform's ease of use and intuitive navigation received strong praise, scoring a mean of 4.2/5.
- 4) Net Benefits: Participants perceived that the system significantly improved their ability to identify risks and enhanced transparency, reflected in a mean score of 4.5/5.

ANOVA tests revealed no significant differences in user satisfaction levels across the four pilot provinces ($p > 0.05$), suggesting that the platform was consistently effective and well-received across diverse regional contexts.

Qualitative Insights from Interviews

Semi-structured interviews with 24 key informants yielded rich qualitative insights, which were categorized into three primary themes: (1) procurement risks, (2) reform barriers, and (3) perceived platform benefits.

- 1) Procurement as a High-Risk Area: Both government officials and civil society actors consistently emphasized the inherent vulnerability of procurement processes. They highlighted technical complexity and the presence of high-value contracts as primary drivers of corruption. As one official from Province A explained, "Procurement involves many steps, from drafting terms of reference to evaluating bids. Each step is an opportunity for manipulation, whether by inflating budgets, tailoring specifications, or colluding with contractors." This testimony reinforces the quantitative findings on the high risk of procurement.
- 2) Barriers to Reform: Several respondents pointed out significant challenges to implementing effective anti-corruption reforms. These barriers included entrenched patronage networks, pervasive political interference, and a perceived lack of capacity at the provincial level. A Civil Society Representative from Province C articulated this, stating, "Even when regulations are clear, local officials face pressure from influential actors. Without transparency and external monitoring, reforms remain paper tigers." This indicates that while technological solutions are vital, they must operate within a supportive institutional and political environment to be truly effective.
- 3) Perceived Benefits of the Platform: Interviewees expressed strong support for the digital platform, noting its ability to reduce subjectivity and empower both officials and external stakeholders. An official from Province D highlighted, "The platform provides numbers, not opinions. It shows risk objectively. This gives us confidence and helps us push for better accountability." Similarly, an NGO Representative from Province B emphasized the newfound capability, stating, "For the first time, we can monitor procurement risks in real time. This changes the game, because information is power." These insights underscore the platform's role as a catalyst for reform, enhancing transparency and accountability.

Integration of Findings

The quantitative and qualitative results converge on three main conclusions:

- 1) Public procurement consistently emerges as the highest-risk domain within regional government, a finding supported by both statistical evidence from the platform and consistent participant testimony confirming its vulnerability.

2) The NLP-based platform proves effective and well-received, demonstrating high user satisfaction across multiple dimensions, validating its utility as a practical anti-corruption tool.

3) Stakeholders perceive the platform as a significant catalyst for reform, fostering enhanced transparency and reduced discretion. However, they also acknowledge the persistent challenges posed by structural and cultural barriers, which must be addressed for sustainable reform.

In summary, the findings establish clear evidence of corruption vulnerabilities in procurement, validate the utility of the NLP-driven platform, and underscore the importance of digital innovation as a complement to institutional reform. They also highlight persistent challenges rooted in cultural norms and political structures, which warrant further discussion.

Conclusion and Discussion

This study provides a comprehensive interpretation of its findings, highlighting their theoretical contributions, policy implications, relevance to Sustainable Development Goals, comparative lessons from Asia, and acknowledging its limitations while suggesting future research directions.

Interpretation of Key Findings

The study's results unequivocally confirm that public procurement remains the most corruption-prone process within regional government administration under Thailand's Ministry of Interior. This finding aligns with extensive international literature, which consistently identifies procurement as a high-risk area due to the substantial financial flows involved, technical complexities, and numerous opportunities for collusion between officials and contractors (Fazekas et al., 2016; Organisation for Economic Co-operation and Development, 2025). In contrast, licensing and discretionary authority, while still presenting risks, exhibited comparatively lower levels of corruption vulnerability. This pattern underscores the urgent need to prioritize strengthening oversight and transparency mechanisms, specifically in procurement.

Furthermore, the study demonstrates that the NLP-based risk assessment platform is both practical and well-received. Quantitative survey data revealed high user satisfaction across all dimensions of the DeLone and McLean IS Success Model (2003), while qualitative interviews consistently emphasized the platform's ability to reduce subjectivity and empower both officials and civil society actors. Collectively, these results validate the theoretical integration of the COSO-ERM framework for structured risk assessment and the IS Success Model for user evaluation.

Theoretical Contributions

This study makes three significant theoretical contributions to the fields of public administration, digital governance, and anti-corruption:

1) Integration of Risk Management and Information Systems Theory: By combining COSO-ERM with the DeLone and McLean IS Success Model, the research provides a multidimensional evaluation framework. This framework uniquely considers both systemic corruption risks and user perceptions, offering a more holistic view than previous models.

2) Advancement of Digital Governance Literature: The study demonstrates how NLP-based analytics can automate the detection of corruption risk indicators, thereby filling a crucial gap in Thai scholarship. Prior research has primarily focused on institutional and cultural aspects of anti-corruption (Sarnthoy, 2019; Kanyajit & Ketsil, 2018; Kalyanamitra et al., 2018), leaving the potential of advanced digital technologies largely unexplored.

3) Contextualization in Asian Governance: The findings contribute to comparative debates by situating Thailand's experiences alongside those of other Asian nations, such as Korea's OPEN system and Indonesia's e-procurement reforms. This comparative analysis highlights

both commonalities in corruption challenges and context-specific adaptations required for digital solutions in the region.

Policy Implications

The findings carry significant implications for policy and practice in Thailand, offering concrete recommendations:

- 1) Procurement Reform Prioritization: Given that procurement is the highest-risk domain, reforms should prioritize digitalizing procurement cycles. This includes implementing open bidding platforms, real-time monitoring dashboards, and leveraging blockchain-based record-keeping for enhanced security and immutability.
- 2) Institutional Integration: The digital platform should be formally linked with existing oversight mechanisms, such as the NACC's Integrity and Transparency Assessment (ITA), and harmonized with the Public Procurement Act to ensure legal and administrative coherence.
- 3) Capacity Building: Training programs for provincial officials should integrate technical instruction with ethical awareness. As Sarnthoy (2019) emphasizes, HRM practices like merit-based promotion and ethics training are crucial for sustaining reform efforts and fostering a culture of integrity.
- 4) Citizen and Network Engagement: Building on Kanyajit & Ketsil (2018)'s work, the platform could be integrated with broader anti-corruption networks, including NGOs, community monitors, and local media. This citizen oversight would enhance transparency and counterbalance political interference.
- 5) Scalability and Interoperability: The platform should be scaled to cover all provinces and designed for seamless interoperability with other government databases, enabling cross-agency collaboration and comprehensive monitoring.

A further critical implication is the integration of emerging technologies, such as blockchain and AI-based predictive analytics, into the procurement lifecycle. Blockchain's immutable ledger can ensure tamper-evident records for award decisions, contract amendments, and delivery milestones. AI-driven anomaly-detection models can flag suspicious bidding patterns indicative of collusion or bid-rigging. Thailand could pilot these tools in high-value infrastructure projects where integrity gains are most impactful. Comparative Asian lessons, such as South Korea's KONEPS and Malaysia's MyPROCUREMENT, reinforce the value of process digitalization, data-driven compliance monitoring, and public access to contract data for third-party scrutiny. Beyond automation, reform should evolve towards open data ecosystems where government publishes granular, machine-readable procurement records, allowing civil society, academia, and the private sector to co-produce oversight. Such arrangements cultivate a virtuous cycle of transparency, trust, and participation, aligning domestic reforms with best regional practices.

Contributions to Sustainable Development Goals (SDGs)

This study makes direct and indirect contributions to several SDGs:

- 1) SDG 16 (Peace, Justice, and Strong Institutions): By effectively reducing corruption risks, the platform directly strengthens accountability and builds public trust in government institutions.
- 2) SDG 9 (Industry, Innovation, and Infrastructure): The integration of advanced analytics into governance processes demonstrates how innovation can enhance institutional performance and efficiency.
- 3) SDG 11 (Sustainable Cities and Communities): Transparent procurement ensures that resources for infrastructure and services are allocated equitably, thereby improving urban governance and citizen well-being.

4) SDG 12 (Responsible Consumption and Production): Efficient and accountable resource management, facilitated by digital tools, contributes to sustainability by reducing waste and misuse of public resources.

These contributions align Thailand's domestic reform agenda with its international commitments, reinforcing the global relevance of the study.

Comparative Lessons from Asia

Placing the findings in a broader regional context reveals both commonalities and context-specific challenges across Asian nations:

1) Similarities with Korea's OPEN System: The Thai platform, like Korea's OPEN system, effectively reduces discretion and enhances transparency in administrative processes. However, Thailand faces unique challenges from stronger patronage networks that may resist full implementation, a contrast with Korea's context.

2) Parallels with Indonesia's e-Procurement Reforms: The platform shares similarities with Indonesia's e-procurement reforms in addressing procurement vulnerabilities. However, Thailand's centralized bureaucracy requires careful adaptation to avoid potential bottlenecks observed in other contexts.

3) Lessons from Singapore's Smart Nation Initiative: Singapore's Smart Nation initiative underscores the benefits of data integration across sectors. Achieving similar outcomes in Thailand would necessitate significant institutional reforms to break down existing ministerial silos and foster inter-agency collaboration.

These comparisons collectively suggest that while digital tools possess immense potential, their successful implementation is fundamentally contingent upon strong political will, a conducive administrative culture, and active citizen engagement.

Limitations and Future Research Directions

Several limitations of this study must be acknowledged:

1) Scope of Study: The research was limited to four provinces, which may not fully capture the administrative diversity across all of Thailand. Future research should expand to include more provinces and cross-regional comparisons for broader generalizability.

2) Pilot Stage Evaluation: The platform was tested in its pilot phase. Therefore, its long-term sustainability, cost-effectiveness, and resistance to manipulation remain untested, warranting further longitudinal study.

3) Focused Ministry: The study focused exclusively on regional agencies under the Ministry of Interior. Corruption risks may vary significantly in other ministries or sectors (e.g., health, education), suggesting a need for broader investigation.

4) Limited Cross-National Analysis: While comparisons were drawn to Asian cases, deeper empirical cross-country studies would provide richer insights into context-specific factors influencing the success of digital governance.

Building on these limitations, future research should:

1) Longitudinal Research: Conduct longitudinal studies to examine the platform's sustained impact and long-term viability.

2) Comparative Cross-National Studies: Explore comparative cross-national case studies in Asia to analyze how cultural and institutional contexts mediate technology adoption and effectiveness.

3) Emerging Technologies: Incorporate and evaluate technologies such as blockchain, predictive analytics, and machine learning to further enhance risk-detection capabilities.

4) Citizen Participation and Social Norms: Investigate the role of citizen participation and social norms in shaping the effectiveness of digital anti-corruption tools.

5) Policy Transferability: Evaluate the transferability of elements of Thailand's platform to other countries facing similar governance challenges.

In conclusion, this study demonstrates that corruption remains a significant obstacle to good governance in Thailand, particularly within public procurement. By successfully piloting an NLP-based risk assessment platform, the research shows that digital innovation can play a vital role in reducing risks, enhancing transparency, and building institutional trust. The robust integration of COSO-ERM and IS Success Model frameworks provided a strong methodological approach for both risk management and system evaluation. The findings offer practical recommendations for procurement reform, institutional integration, capacity building, citizen engagement, and scalability. They also underscore Thailand's significant contribution to broader regional and global debates on digital governance and anti-corruption, particularly in relation to the Sustainable Development Goals. Ultimately, combating corruption effectively requires more than just technological solutions; it demands strong political will, comprehensive institutional reform, and a shift in cultural attitudes. However, when these essential elements are synergistically combined, digital platforms emerge as powerful enablers of integrity, accountability, and sustainable development.

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Data Availability Statement: The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Conflicts of Interest: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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