

A Study on the Use of Blockchain Technology to Prevent and Detect Corruption in Thailand's Government Procurement Process

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Received: September 16th, 2024 | **Accepted:** March 2nd, 2026

ABSTRACT

This study aims to propose several recommendations for adopting blockchain to government procurement and for solving corruption. The results of the study can be summarized as: readiness of blockchain technology can prevent corruption and the level of readiness of blockchain adoption for government procurement and for solving corruption is low. The study proposes developing a blockchain system and a smart contract system in the selection of committees to enhance transparency via online grading both in the selection procedure and procurement projects, to undergo online e-government procurement training, and to develop an online grading system for the committees.

KEYWORDS

Government Procurement, Blockchain Technology, Blockchain Technology

INTRODUCTION

Research Problem

The assertion that government procurement is globally vulnerable to corruption is a persistent finding, extensively documented by major international bodies who highlight its staggering economic scale. Public procurement accounts for an estimated \$13 trillion in global spending annually, representing a significant portion of gross domestic products in many nations and creating vast opportunities for illicit enrichment (World Bank, 2024). The Organization for Economic Co-operation and Development (OECD) continues to identify public procurement as a primary government function at risk for waste and fraud, with recent analyses emphasizing integrity risks in an increasingly digital and crisis-prone environment (OECD, 2023). While foundational estimates have suggested that 10% to 30% of a contract's value can be lost to corruption, the International Monetary Fund (IMF) provides a broader macroeconomic perspective, estimating that the global cost of bribery in both the public and private sectors amounts to trillions of dollars each year, severely hampering economic growth and public service delivery (IMF, 2023). This vulnerability is further corroborated by recent thematic reports from the United Nations Office on Drugs and Crime (UNODC), which detail the evolving schemes used to circumvent regulations, particularly in emergency procurement scenarios (UNODC, 2025).

DOI: 10.4018/IJEGR.406734

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In Thailand, this global issue is a persistent and systemic challenge. Historical analysis reveals deep-seated institutional practices where political power is leveraged to manipulate procurement contracts for personal and party enrichment (Phongpaichit & Piriyaangsan, 2005). This is reflected in Thailand's performance on the 2023 Corruption Perceptions Index, where it scored just 36 out of 100, ranking 101st out of 180 countries—a score significantly lagging behind regional peers like Singapore and Malaysia (Transparency International, 2024).

Within the landscape of public procurement, certain systemic vulnerabilities often undermine the integrity of competitive bidding. A primary concern is the strategic manipulation of the Terms of Reference (TOR), where technical specifications are narrowly tailored to align with the unique profile of a preferred contractor. This “TOR tailoring” effectively excludes legitimate competitors before the formal process even begins. Furthermore, the absence of robust price competition is frequently signaled by bid results that cluster narrowly below the official reference price—a hallmark of collusive behavior. Such patterns suggest that even within a regulated framework, the combination of information asymmetry and localized influence can circumvent standard transparency measures. Furthermore, the opaque nature of tender evaluations and the potential for biased selection of committee members are cited as key enablers of corrupt deals (Quah, 2018). Even Thailand's electronic government procurement (e-GP) system is insufficient, as it primarily digitizes submission processes while crucial decisions regarding evaluation and scoring remain offline, leaving them susceptible to manipulation (Tanpraphan et al., 2026).

Research Gap

While the potential of blockchain is widely discussed, several governments are already pioneering its use. The “Dubai Blockchain Strategy” in the United Arab Emirates, for example, is a state-level initiative to integrate the technology across government functions, including supply chain management (Smart Dubai, 2020). Similarly, Estonia has used a blockchain-like technology called keyless signature infrastructure (KSI) for over a decade to secure public records and ensure data integrity in its e-governance systems (e-Estonia, n.d.).

Despite these international examples, a significant research gap exists for Thailand. A review of existing academic literature shows that most studies on blockchain for procurement are either theoretical frameworks that are not context-specific (Ali et al., 2026) or systematic reviews whose geographical focus is on developed nations, with no in-depth case studies on Thailand (Mircea et al., 2022). Consequently, there is no comprehensive study that empirically assesses the readiness of Thai stakeholders or proposes a tailored implementation framework that addresses the nation's unique legal, administrative, and behavioral challenges.

To address this gap, this study aims to investigate how blockchain technology can be used to prevent and detect corruption in Thailand's government procurement process. This leads to the central research question:

How can blockchain technology be effectively designed and implemented to prevent and detect corrupt practices within the specific legal, administrative, and behavioral context of Thailand's public procurement system?

Aim and Objectives

Considering these developments, the aim of this study is to investigate the adoption of blockchain technology in government procurement and formulate a set of policy recommendations for its practical application in addressing corruption challenges in Thailand. To achieve this aim, the following specific objectives were established:

- To explore the evolution of blockchain technology, its associated policies and regulations, and its impact on both domestic and international efforts to combat corruption.

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