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Exploring Experts' Mental Models in the Adoption of Blockchain Technology in Public Sector Organizations Using Q Methodology

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Abstract

The objective of this research is to investigate the mindsets of experts regarding the application of blockchain technology in government organizations using Q methodology. This study is applicable in its objective, and employs a mixed-methods approach for its execution. The statistical population of the research consists of managers in government organizations. Using purposive sampling and based on the principle of theoretical sufficiency, 19 individuals were selected as the statistical sample. With respect to the research approach, the qualitative phase initially involved 19 interviews to establish discourse; and the sample, Q-options, and finally the Q-set were derived through their perspectives and opinions. Subsequently, in the quantitative phase, the data obtained from the qualitative phase were analyzed and examined using SPSS. The findings indicate that transparency, increased productivity, enhanced agility, corruption prevention, elevated trust levels, improved electronic voting, secure identity management, and improved innovation are the eight mindsets of managers concerning blockchain technology in government organizations.

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Extended Abstract

Introduction

The contemporary era of digitalization is placing significant pressure on administrative sectors, both in the private and public domains, to initiate and advance their digital transformation agendas (Hammad et al., 2023). Blockchain technology is one such technology that can be utilized within administrative systems (Cagigas et al., 2022; Seyedsayamdost & Vanderwal, 2020; Tandon et al., 2021). Some of the areas where blockchain is being tested for government services include: cryptocurrency/payments, land registration, identity management, document authentication, supply chain tracking, healthcare, education, company registration, data management, auditing, energy markets, taxation, voting, and the management of legal entities (Muafiq, 2024; Tan et al., 2022). The increasing adoption of blockchain in public sectors indicates that this technology possesses a broader capacity to enhance trust, accountability, and operational efficiency in governance functions. Particularly, the decentralized and immutable nature of blockchain offers a compelling solution to the long-standing challenges in these domains in areas such as digital identity management, adherence to requirements and regulations, and the provision of public services (Chen et al., 2026). It is claimed that blockchain will profoundly transform the process of producing and delivering public services (Rana et al., 2022). With key features such as decentralization, persistence, transparency, privacy and security, accuracy, and notably, cost and network savings, this technology significantly enhances the value in accessing data and minimizing intermediation in digital processes (Dowlatabadi, 2025; Hammad et al., 2023; Jamali, 2023; Rana et al., 2022). Furthermore, blockchain contributes to improving process efficiency through automation with smart contracts. These self-executing contracts can streamline administrative tasks, reducing the time and costs associated with manual processes. Moreover, the decentralized nature of blockchain technology enhances trust among participants by eliminating the need for intermediaries and providing a secure and transparent platform for transactions. Integrating blockchain into administrative processes can lead to increased trust through information transparency, predictability, and efficiency. By leveraging blockchain's capabilities such as data aggregation through smart contracts and ensuring data security via cryptographic algorithms, administrative processes can be simplified and become a more reliable tool (Muafiq, 2024). Therefore, considering the perspectives of experts, this research seeks to answer the question: What are the mindsets of experts in the application of blockchain technology in government organizations, using Q methodology?

Theoretical Framework

Blockchain in Government Organizations

Blockchain is a combination of existing technologies such as distributed ledgers, cryptography, hashing, and consensus protocols. All transaction records in a blockchain are stored in a chain of data packets (blocks) and distributed across a peer-to-peer network. All nodes in the network possess a copy of the blocks (Batubara & Janssen, 2018). This technology can resolve or mitigate issues related to transparency, trust, public policies, and service quality. The adoption, implementation, or integration of blockchain technologies by governments and public institutions can be beneficial for all stakeholders. For instance, blockchain can help optimize data management among public service provider organizations, not only in terms of interoperability, trust, and transparency; but also in terms of data accuracy, coordination, traceability, and integrity. It is also suggested that this technology can aid in preserving existing organizational and management structures. Therefore, blockchain is

presented as a solution for governments to address significant public sector challenges such as transparency and fairness in processes and procedures (Fosso et al., 2024).

Chen et al. (2026), in their research, conducted a comprehensive review of blockchain applications in government, demonstrating that blockchain can play a transformative role by enhancing transparency, efficiency, and security in public services (e.g., healthcare, e-voting, and registration systems). They also identified driving forces and barriers to adoption through force field analysis and emphasized the need for interdisciplinary research and regulation/collaboration for successful implementation.

Murano et al. (2026), through their research, found that despite blockchain's capacity to enhance transparency, efficiency, and trust in public services, its adoption remains slow due to organizational and technical barriers. They identified specific public sector challenges, such as interoperability and a lack of technical expertise, through a systematic review and proposed tailored strategies for effective implementation.

Research Methodology

This research is applicable in terms of its objective, and was conducted using a mixed-methods approach. The statistical population of the research consists of managers in government organizations. Using purposive sampling and based on the principle of theoretical saturation, 19 individuals were selected as the statistical sample. With respect to the research approach, the qualitative phase initially involved 19 interviews to establish discourse.

Research Findings

A sample, a Q-sort, and finally a Q-set were obtained using the experts' insights and opinions. In the quantitative phase of the research, the data obtained from the qualitative section were analyzed using SPSS. The findings indicate that transparency, increased productivity, enhanced agility, corruption prevention, improved trust levels, better e-voting, secure identity management, and improved innovation are the eight mental models of managers regarding blockchain technology in government organizations.

Conclusion

The present research was conducted with the aim of examining the mental models of experts in the application of blockchain technology in government organizations, using the Q methodology. The results of this research are aligned with the findings of the studies by Chen et al. (2026), Murano et al. (2026), Hammad et al. (2026), Mueller et al. (2026), Rubino et al. (2026), Sánchez-obando et al. (2025), Fosso et al. (2024), Akhmetbek & Špaček (2021), Sung & Park (2021), Brauner & Janissek-muniz (2020), Reddic et al. (2019), Navadkar et al. (2018), and Qian et al. (2017). Reddic et al. (2019) state that blockchain prevents the excessive concentration of power in the hands of a few, possesses a more transparent legal framework, and provides citizens with more information. This higher level of transparency allows citizens to monitor public transactions. They emphasized that with a greater degree of transparency and security, undesirable behaviors can be quickly identified and curbed.

Based on the research results, the following suggestions are presented:

To enhance and empower government organizations in achieving their objectives, it is recommended that managers pay special attention and consideration to blockchain technology.

Blockchain can minimize the risk of using unreliable systems and provide rapid access to information for stakeholders, thereby improving the performance of public sector institutions.