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# A Bridging the Technology-Government Policy Divide: Understanding the Acceptance of Blockchain Adoption in Thailand's Agriculture

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## Abstract

Blockchain technology has the potential to revolutionize agricultural management, enhancing transparency, optimizing processes, and providing access to accurate data. This research focuses on investigating the factors influencing the adoption of blockchain technology in Thailand's digital agriculture policy. A comprehensive methodology involving well-structured questionnaires, rigorous pilot tests, and advanced statistical analyses was employed, with data collected from diverse stakeholders including government entities, private sectors, and farmers. The study's findings reveal the crucial roles of stakeholders' perceptions of blockchain benefits, inter-organizational trust, and relationships in shaping the technology's acceptance. Notably, the dynamics of organizational power, specifically non-mediated power, emerge as significant determinants in establishing inter-organizational trust, a critical precursor to blockchain adoption and effective policy implementation. The implications of this research extend to governmental and private entities seeking to incorporate new technologies seamlessly into their operations. Furthermore, the study contributes substantially to a comprehensive understanding of the multifaceted factors influencing blockchain's acceptance in supporting digital economy policies within Thailand's agricultural sector. This scholarly endeavor bridges theoretical understanding with practical application, offering valuable insights for both academic discourse and the real-world implementation of transformative digital strategies in agriculture. In summary, the research underscores the pivotal role of stakeholders' perceptions, trust, and power dynamics in driving the acceptance and integration of blockchain technology within Thailand's digital agriculture landscape, shaping the sector's digital transformation.

**Keywords:** Blockchain Technology, Agriculture's Policy, Digital Economy

**JEL Classification Code:** H11, H39, O023

## 1. Introduction

Thailand's agricultural sector plays a significant role in the country's economy, serving as a major producer and exporter of various commodities including rice, rubber, fruits, vegetables, animal feed, and fish. This sector contributes to Thailand's global trade, ranking 13th with a trade value of 1,553,822 million baht (International Agricultural Economics Division, 2023). However, despite its importance, agriculture in Thailand faces challenges such as price volatility resulting from imbalances between supply and demand (MHESI, 2021). The prices of agricultural products are influenced by market dynamics, where high demand relative to supply leads to price increases, while low demand results in price decreases, directly affecting farmers. In response, the Thai government has implemented policies to stabilize prices, including the establishment of the Public Warehouse Organization in 1955 (Ministry of Finance,

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2021), followed by the rice pledging scheme under the Bank for Agriculture and Agricultural Cooperatives (BAAC) in 1982 (Boonsri, 2018). However, these direct interventions have placed a burden on the government's budget (Poapongsakorn, 2013). To address this issue, the Thai government introduced the "Pledge Guarantee Scheme" in 2009, later replaced by the "Price Insurance Scheme" in 2009, aiming to minimize market distortions and reduce government intervention while ensuring genuine market influence (Chuelek & Jongjaroen, 2016). Despite the government's agricultural insurance program support through the BAAC since 2019, Thai farmers have experienced a concerning trend of increasing household debt over the past eight years, with debt levels reaching as high as 70% of asset value (Chantarat, 2021). This debt crisis can be attributed to factors such as outdated farming methods, cultivation of low-value crops, lack of risk diversification, and insufficient income to cover production costs (Jenpungphon, 2021). To address these challenges, the Thai government should take a proactive role in implementing policies that support farmers in enhancing their production capacity and income sustainably. This can be achieved through initiatives such as large-scale agriculture, mixed farming, precision agriculture, value-added creation, and cultivation of high-value crops (Prasitdechsakul, 2022). By prioritizing these areas, the Thai government can assist farmers in breaking the cycle of poverty (Bass, 2009) and promote sustainable agricultural development.

The implementation of state policies to assist, support, and develop Thai farmers involves a complex and multi-step process. At each stage, several state and private sector agencies and individuals are involved, leading to various challenges in policy implementation (Buarod, 2019). These challenges include ineffective collaboration and inefficiency in policy implementation, particularly regarding incomplete or non-independent data verification, which results in delays in data processing and compromises the quality of policy implementation (Nilthanom, 2021). Currently, there is growing interest in the application of Blockchain technology across different industries and sectors due to its secure and efficient data storage and sharing capabilities. It has found applications in finance, transportation, food, health, and more (Thongsuk, 2023). This study focuses on the utilization of Blockchain technology in the implementation of complex and high-budget state policies. The objective is to address the following issues: 1) Data security: Blockchain technology ensures the secure storage of data, preventing unauthorized access and leakage. 2) Transparency and trust: Blockchain technology guarantees the transparency and reliability of transactions and operations by making data on the blockchain immutable and tamper-proof. 3) Anti-corruption measures: Blockchain technology can reduce the risk of corruption by providing a transparent and traceable system. 4) Expedited data processing: Compared to traditional systems, Blockchain technology offers faster data processing as it eliminates the need for a central authority. 5) Enhanced monitoring and control: The transparency and immutability of data on the Blockchain enable more effective monitoring and control of system usage. 6) Effective government budget management: Blockchain technology can contribute to reducing corruption in government budget spending by promoting transparent and accountable expenditure practices. 7) Efficient resource management: Blockchain technology can streamline the management of resources related to state policy implementation, including farmer data, agricultural land, and production factor management, by simplifying complex processes and ensuring data integrity.

The utilization of blockchain technology in supporting Thailand's agricultural sector holds great promise for driving sustainable innovation and development in policy management (DGA, 2021). However, the successful implementation of this technology relies on collaborative efforts and widespread support from all stakeholders, particularly those engaged in Thai agriculture. It is crucial to deploy efficient technological solutions that effectively manage production factors to empower farmers and foster trust in governmental operations.

## 2. Literature Review

### 2.1 Organizational Power Theory

Organizational power is a fundamental concept that delves into the dynamics of influence and power within social contexts. It sheds light on the relationship between individuals who wield power and those who are subject to it, exploring how different sources of power impact psychology, social influence, and overall power dynamics (Liu et al., 2015). Trust plays a crucial role in shaping these power dynamics across various types of power. In the context of implementing new technologies to support digital economic policies, non-mediated power holds great potential in facilitating the acceptance of these technologies by government agencies and identifying opportunities for organizational growth and benefits. The base of social power is traditionally classified into five types (French & Raven, 1959), which can be further categorized as either mediated power, such as reward and coercive power, or non-mediated power, including referent power, expert power, and legitimate power.

### 2.2 IT Assimilation Theory

The theory of IT assimilation offers valuable insights

into how organizations incorporate information technology (IT) into their operations. It highlights the significance of integrating various factors, including technical, business, organizational, social-cultural aspects, and mediated power, to achieve effective IT assimilation. This process takes different forms based on user characteristics, behaviors, and the level of organizational support for IT integration in business processes and activities. Successful IT assimilation can drive organizational performance improvements by optimizing processes and empowering employees to utilize IT effectively (Rotchanakitumnuai, 2013). According to Wang et al. (2019), an organization's ability to assimilate IT hinges on its capacity to procure and leverage technology resources to derive benefits. IT assimilation can be understood through three dimensions: acceptance or rejection, dispersion, and supportive control (Kouki et al., 2010). These dimensions encompass users' acceptance or rejection of IT, the strategies and methods employed for IT implementation within organizations, and the mechanisms in place to support control and monitoring of IT usage. These dimensions collectively shape the organization's IT assimilation process. Interorganizational Business Process Standards (IBPS) have been developed to promote conformity and facilitate relationships among organizations, specifically in data exchange and business transactions. These standards play a crucial role in establishing smooth and efficient inter-organizational relationships (IORs) within the IT assimilation model of IBPS, which consists of three dimensions (Bala & Venkatesh, 2007) :

1) Relational Mechanism emphasizes the importance of fostering personal relationships within an organization. It focuses on building strong connections and encouraging collaboration among personnel to enhance work efficiency and overall operational outcomes.

2) Organizational Pressure involves studying and analyzing the impact of external pressures on an organization's work and development. It necessitates organizational adjustments to effectively deal with external influences, such as improving production processes or developing new products.

3) Organizational Inertia Theory examines factors that contribute to an organization's resistance to change. This includes analyzing aspects like organizational structure, culture, employee experience and skills, organizational goals, and other elements that influence resistance when proposing changes or improvements.

These dimensions provide valuable insights into understanding and managing inter-organizational relationships (IORs) within the context of IT assimilation and IBPS. By considering these dimensions, organizations can navigate the complexities of inter-organizational collaboration more effectively.

## 2.3 Inter-organizational trust

Trust plays a vital role in fostering strong relationships between organizations. It is built through effective leadership, open communication, and the ability to navigate uncertainties and external pressures. These elements are particularly important in dynamic and rapidly changing environments, where organizations must adapt to survive and thrive (Yue et al., 2019). Trust encompasses two essential components: intellectual intelligence, which involves knowledge and expertise, and emotional intelligence, which pertains to understanding and managing emotions (Asif et al., 2022).

Trust plays a vital role in the successful implementation of government policies, especially when collaborating with external organizations such as private companies, investment agencies, and non-governmental organizations. Establishing trust between these entities is essential for promoting cooperation, reducing conflicts, and ensuring the efficient execution of policies and laws. By fostering transparency in government operations and inspiring confidence in the public and business sectors, trust adds value to the services provided and benefits the individuals involved (Wijaya et al., 2022). Developing a relationship model based on trust is crucial for expediting operations and supporting Thailand's digital economy policy. To achieve positive outcomes and align with national strategies, the government should invest in comprehensive research, analysis, strategic planning, and the development and testing of systems (Zancajo et al., 2022). Furthermore, nurturing specialized human resources with expertise in research and system development can cultivate trust in inter-organizational relationships across diverse entities.

## 2.4 Inter-organizational Relationships

Inter-organizational relationships refer to the connections established between two or more organizations that engage in collaborative work processes. The level of collaboration varies depending on the significance of the partnerships between these organizations. These relationships can take the form of enduring connections, characterized by either cooperative or competitive interactions. It is essential for organizations to comprehend the contextual factors that shape these relationships, enabling them to assess the dynamics and develop strategies that align with the needs of all involved parties. Inter-organizational relationships can be examined from four perspectives: resource dependence, collaborative network, population ecology, and institutionalism (Daft, 2006).

In order to effectively support digital economy policies through inter-organizational collaborations, organizations must have a comprehensive understanding of the factors that

influence technology adoption and utilization (Kanjanalkod et al., 2016). Their study on the effectiveness of innovation management in Thai municipalities revealed that innovation management plays a crucial role in enhancing work processes' efficiency and shaping the organization's image. To improve work efficiency, it is imperative to allocate resources effectively, standardize operational development, and leverage information technology as a vital tool for knowledge management. The availability of high-quality knowledge and efficient knowledge management systems is paramount, while ensuring that information channels provide quick access to data. Chueasraku (2018) emphasized the adoption of appropriate concepts and strategies to facilitate coordinated inter-organizational collaborations, thereby enhancing work efficiency within the Thai public sector. These reforms reflect the ongoing need for continuous improvement in the Thai public sector.

### 2.5 The application of blockchain technology in supporting Thailand's digital agricultural economy policy

The state sector in agriculture is facing a significant challenge when it comes to supporting small-scale farmers, who make up around 80% of the farming community in Thailand (Attavanich et al., 2018). These farmers often struggle to access the necessary funding and quality production resources, resulting in low yields and insufficient income to sustain their livelihoods. This perpetuates a cycle of poverty among them (Isakul, 2021). This issue not only hampers the long-term economic development of the country but also underscores the existing challenges in managing the state sector in agriculture, including a lack of coordination and cooperation among government agencies and relevant organizations, inadequate investment in infrastructure and new technologies (Kuraeiad & Thammachot, 2019), and limited support provided to farmers in various aspects, leading to a decline in product quality and a loss of competitiveness in the global market for Thai agricultural products. In light of these challenges, the implementation of blockchain technology in agricultural management holds significant potential. It can enhance transparency, streamline operations, and facilitate the access and sharing of high-quality and accurate data (Catherine & Pierre, 2017), Blockchain technology, in particular, can be instrumental in managing critical natural resources like water (Xia et al., 2022), land (Racetin et al., 2022), and optimizing the selection of efficient plant varieties. Moreover, by ensuring the traceability of agricultural products and raw materials, blockchain technology can help reduce corruption in all stages of the agricultural value chain and promote effective budget management. The utilization of blockchain technology to support Thailand's digital agricultural economy policy can deliver a multitude of benefits to farmers, including the ability to verify the origin of production resources, accurately monitor weather and soil conditions, mitigate risks and losses resulting from natural disasters in agricultural areas, and ultimately enhance the overall performance and sustainability of the Thai agricultural sector. By aligning with Thailand's national strategy, this approach can pave the way for the successful implementation of policies that drive the country's agricultural development.

## 3. Research Methodology

### 3.1 Conceptual Framework

Based on previous research conducted by Ke et al. (2009) sheds light on the correlation between organizational power and trust, revealing the impact of both mediated and non-mediated power on organizational trust. This finding aligns with the findings of previous studies by Park et al. (2017) and Handley and Benton (2012). Each type of power is associated with distinct trust dynamics. Mediated power, including reward power and coercive power, is utilized by organizations with stronger bargaining power to enforce compliance and the adoption of technology between organizations (Ke et al., 2009). Such power dynamics can negatively affect trust, knowledge sharing, and the alignment of organizational goals (Ke et al., 2009). Consequently, these findings support the formulation of a hypothesis, as depicted in Figure 1.

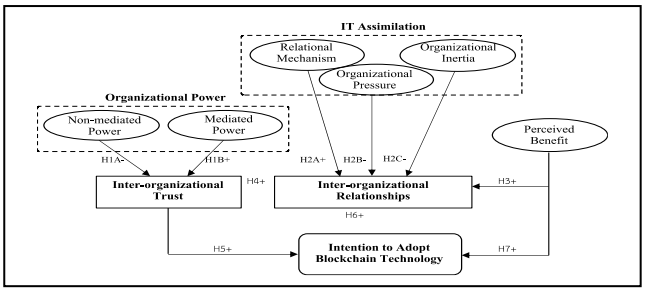


**Figure 1:** Conceptual framework.

From the conceptual frame work, the hypotheses are:

**Hypothesis 1A:** Mediated power has a negative effect on inter-organizational trust.

**Hypothesis 1B:** Non-mediated power has a positive effect on inter-organizational trust.

**Hypothesis 2A:** Relational mechanism has a positive effect on inter-organizational relationships.

**Hypothesis 2B:** Organizational pressure has a negative effect on inter-organizational relationships.

**Hypothesis 2C:** Organizational inertia has a negative effect on inter-organizational relationships.

**Hypothesis 3:** Perceived benefit of blockchain technology has a positive effect on inter-organizational relationships.

**Hypothesis 4:** Inter-organizational trust has a positive effect on inter-organizational relationships.

**Hypothesis 5:** Inter-organizational trust has a positive effect on intention to adopt blockchain technology.

**Hypothesis 6:** Inter-organizational relationships have a positive effect on intention to adopt blockchain technology.

**Hypothesis 7:** Perceive benefit of blockchain technology has a positive effect on intention to adopt blockchain technology.

## 3.2 Research Methodology

This research study employed a questionnaire as a research tool, which gathered pertinent questions from previous research and customized them to suit the context of this study. The questionnaire was divided into two parts:

1) general information about the respondents, including gender, education level, age, and type/size/position/tenure of employment, and information technology usage behavior within the organization

2) opinions on the factors that affect the application of blockchain technology in supporting the digital economy policy of the Thai agricultural sector. The opinions were gauged using a 5-point Likert scale (5 – Strongly Agree, 1 – Strongly Disagree), which was tested for reliability using Cronbach's Alpha Coefficient. Furthermore, the questionnaire underwent two pilot tests, the first pilot test engaged 37 respondents, followed by a subsequent test involving 20 participants. The rationale behind conducting two pilot tests lay in the recognition that distinct perspectives and feedback from these pilot groups would enable a comprehensive refinement of the questionnaire. This iterative process allowed for the identification of potential issues and improvements that contributed to the ultimate robustness of the survey instrument.

## 3.2 Selection of Respondent

The population for this research consists of individuals involved in Thailand's agricultural sector policy, including (a) government agencies, (b) private sector organizations, and (c) research and technology development organizations (Office of Agricultural Economics, 2021). The sampling method utilized to select the sample group is non-probability purposive sampling. This means that the sample group comprises individuals working in the specified area to ensure suitability for the research. The sample size was determined using Cochran's formula (1977) with a confidence level of 95% and a margin of error of 5%, resulting in a sample size of 385 respondents.

## 3.3 Data Analysis

In this research, statistical methods were utilized to analyze the data, hypothesis testing to verify the normal distribution of the data and explore the relationships between variables. The results of the analysis are presented below:

In the process of hypothesis testing, as presented in Figure 1, numerous variables are involved. To reduce the number of variables and group them into the same factor, confirmatory factor analysis was employed to serves a pivotal role in assessing the predefined relationships among latent constructs within the model. The choice of confirmatory factor analysis was underpinned by the suitability of our data, as evidenced by the Kaiser-Meyer-Olkin (KMO)'s statistic value (above 0.5), indicating a relatively homogeneous data distribution. The analysis revealed that the correlation between each variable in each factor was no more than 0.9. Subsequently, Principal Component Analysis was utilized for factor analysis, followed by the Varimax rotation method for variable grouping, using the criterion that the factor loading of each component must be greater than 0.5. Furthermore, the tool's reliability was assessed using the Cronbach's alpha coefficient, which had to be greater than 0.7, as demonstrated in Table 1.

**Table 1:** The analysis of the factor loading, mean, and standard deviation of each variable.

| Factor | Variable | Factor Loading | Means | Standard Deviation |
|---|---|---|---|---|
| Mediated Power **(∝ = 0.883)** | P3Q6MP1 | 0.827 | 3.390 | 0.882 |
| | P3Q6MP2 | 0.900 | 3.280 | 0.912 |
| | P3Q6MP3 | 0.869 | 3.300 | 0.972 |
| Non-mediated Power **(∝ = 0.856)** | P3Q7NMP1 | 0.780 | 3.680 | 0.770 |
| | P3Q7NMP2 | 0.872 | 3.850 | 0.815 |
| | P3Q7NMP3 | 0.872 | 3.850 | 0.754 |
| Relational Mechanism **(∝ = 0.892)** | P3Q2RM1 | 0.523 | 3.720 | 0.723 |
| | P3Q2RM2 | 0.846 | 3.740 | 0.742 |
| | P3Q2RM3 | 0.854 | 3.600 | 0.784 |
| Organizational Pressure **(∝ = 0.865)** | P3Q2OP1 | 0.760 | 3.460 | 0.761 |
| | P3Q2OP2 | 0.858 | 3.400 | 0.752 |
| | P3Q2OP3 | 0.751 | 3.450 | 0.731 |
| Organization Inertia **(∝ = 0.875)** | P3Q2OI1 | 0.766 | 3.970 | 0.769 |
| | P3Q2OI2 | 0.856 | 4.350 | 0.711 |
| | P3Q2OI3 | 0.682 | 3.870 | 0.773 |
| Inter-organizational Trust **(∝ = 0.886)** | P3Q3IOT1 | 0.859 | 3.950 | 0.680 |
| | P3Q3IOT2 | 0.866 | 3.980 | 0.623 |
| | P3Q3IOT3 | 0.766 | 3.050 | 0.659 |
| Inter-organizational Relationship **(∝ = 0.854)** | P3Q4IOR1 | 0.809 | 4.290 | 0.655 |
| | P3Q4IOR2 | **0.491*** | 3.720 | 0.759 |
| | P3Q4IOR3 | 0.906 | 4.320 | 0.686 |
| | P3Q4IOR4 | 0.903 | 4.320 | 0.719 |
| Intention to Adopt | P3Q5IAB1 | 0.915 | 3.330 | 0.848 |

| Factor | Variable | Factor Loading | Means | Standard Deviation |
|---|---|---|---|---|
| Blockchain (∝ = 0.891) | P3Q5IAB2 | 0.956 | 3.330 | 0.708 |
| | P3Q5IAB3 | 0.947 | 3.290 | 0.691 |
| Perceived Benefits of Blockchain (∝ = 0.867) | P3Q1PBB1 | 0.810 | 3.860 | 0.717 |
| | P3Q1PBB2 | 0.758 | 3.810 | 0.691 |
| | P3Q1PBB3 | 0.796 | 3.780 | 0.717 |
| | P3Q1PBB4 | 0.633 | 3.860 | 0.712 |
| | P3Q1PBB5 | 0.709 | 3.720 | 0.788 |
| | P3Q1PBB6 | 0.703 | 3.950 | 0.726 |
| | P3Q1PBB7 | 0.704 | 3.920 | 0.693 |

**Note:** Alpha Cronbach (∝)

From Table 1, it was found that the factor loading of variable P3Q4IOR2 in the factor of inter-organizational trust had a weight of 0.491, which did not meet the criterion set in this study that the factor loading should be greater than 0.5. Therefore, this variable was excluded from further analysis.

When analyzing the data using multiple regression, the results showed that mediated power was a factor that affected the successful implementation of blockchain technology to support Thailand's digital economy policy through inter-organizational trust. On the other hand, the authority to pass did not affect inter-organizational trust, as detailed in Figure 2 and Table 2.

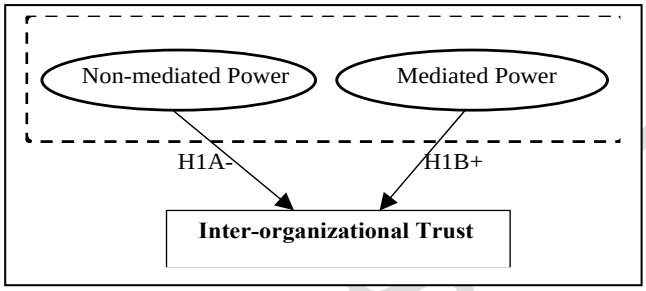


**Figure 2:** The relationship between organizational power and inter-organizational trust.

**Table 2:** The results of multiple regression analysis of factors affecting inter-organizational trust

| Variable | Standardized Coefficients | t | Sig. |
|---|---|---|---|
| Mediated Power | 0.018 | 0.387 | 0.688 |
| Non-mediated Power | 0.472 | 9.598 | **0.000*** |

**p-value < 0.05*

While organizational inertia and organizational trust are important factors in strengthening relationships, inter-organizational trust is the most influential factor affecting inter-organizational relationships. The regression coefficient of trust between organizations is 0.427, indicating a significant impact on inter-organizational relationships. In contrast, mediated power and the perceived benefits of blockchain technology were not significant predictors of inter-organizational relationships, as shown in detail in Figure 3 and Table 3.

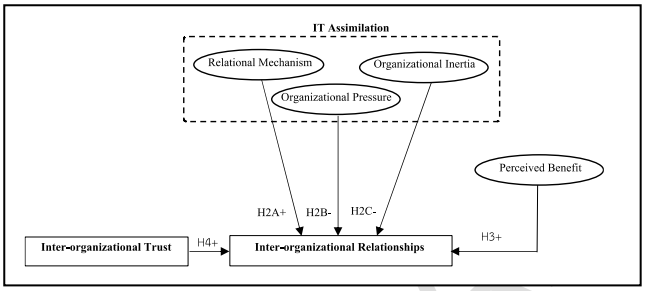


**Figure 3:** The relationship between IT assimilation, Inter-organizational trust, Perceived benefit and Inter-organizational relationships

**Table 3:** Results of multiple regression analysis of factors affecting inter-organizational relationships

| Variable | Standardized Coefficients | t | Sig. |
|---|---|---|---|
| Relational Mechanism | 0.035 | -0.746 | 0.516 |
| Organizational Pressure | -0.032 | 0.732 | 0.461 |
| Organization Inertia | -0.332 | -6.373 | **0.000*** |
| Perceived Benefits of Blockchain | 0.108 | 1.809 | 0.069 |
| Inter-organizational Trust | 0.427 | 8.532 | **0.000*** |

**p-value < 0.05*

The perceived benefits of blockchain technology and inter-organizational trust are important factors that affect the acceptance of using blockchain technology to support Thailand's digital economy policy in the agricultural sector. In addition, the research found that the inter-organizational relationships have a negative impact on the acceptance of using blockchain technology to support Thailand's digital economy policy in the agricultural sector. Perceived benefits of blockchain technology were found to be the most influential factor, as shown in detail in Figure 4 and Table 4.

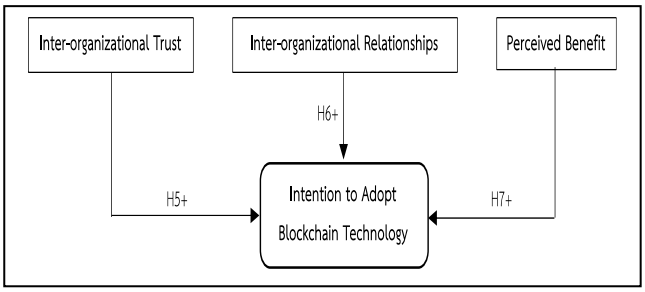


**Figure 4**: The relationship between Inter-organizational trust, Inter-organizational relationships, Perceived benefit and Intention to adopt blockchain technology.

**Table 4:** The results of multiple regression analysis of factors affecting intention to adopt blockchain technology

| Variable | Standardized Coefficients | t | Sig. |
|---|---|---|---|
| Inter-organizational Trust | 0.340 | 5.893 | **0.000*** |
| Inter-organizational Relationships | -0.290 | -4.910 | **0.000*** |
| Perceived Benefits of Blockchain | 0.481 | 9.676 | **0.000*** |

**p-value < 0.05*

## 4. Results and Discussion

Based on the analysis of the factors, the results of the hypothesis testing according to the research framework (Figure 1) can be summarized as follows:

**Hypothesis 1A:** Mediated power has a negative effect on inter-organizational trust.

**Hypothesis 1B:** Non-mediated power has a positive effect on inter-organizational trust.

At a significance level of p-value < 0.05, the research found that it did not support hypothesis 1A but supported hypothesis 1B. The average value of the factor of mediated power was found to be in the range of 3.30-3.39, compared to the range of non-mediated power which was 3.68-3.85. Therefore, it can be concluded that the respondents placed more importance on non-mediated power than mediated power. The research supported hypothesis 1B, which suggests that non-mediated power has a positive effect on inter-organizational trust, with a regression coefficient of 0.472, which is consistent with previous research by Ke et al. (2009), who found that the use of non-mediated power can increase inter-organizational trust.

**Hypothesis 2A:** Relational mechanism has a positive effect on inter-organizational relationships.

**Hypothesis 2B:** Organizational pressure has a negative effect on inter-organizational relationships.

**Hypothesis 2C:** Organizational inertia has a negative effect on inter-organizational relationships.

At a significant level of p-value <0.05, it was found that the research did not support hypothesis 2A and 2B but supported hypothesis 2C. When considering the average values of the factors, relational mechanism had an average value in the range of 3.60-3.74, while the average value of variables in the inter-organizational pressure factors was in the range of 3.40-3.46, which was lower than the average value of variables in the organizational inertia factor, which was in the range of 3.87-4.35. This indicates that the respondents gave more importance to the organizational inertia factor than to the inter-organizational pressure and relational mechanism factors. The research supported hypothesis 2C, which stated that organizational inertia has a negative effect on inter-organizational relationships, with a coefficient of -3.332. This is consistent with the research by Wang et al. (2019) that organizations can change depending on the technological resources and the ability to utilize organizational resources, which is influenced by the high-level management of the organization, affecting the acceptance of information technology and the dissemination of technological innovation within the organization.

**Hypothesis 3:** Perceived benefit of blockchain technology has a positive effect on inter-organizational relationships.

At a significant level of p-value <0.05, it was found that the research did not support hypothesis when considering the average values of factors related to the perceived benefits of blockchain technology. The average values were in the range of 3.72 - 3.95, which was lower than the average values of organizational inertia factor, which were in the range of 3.87 - 4.35, and the average values of factors related to organizational power, which were in the range of 3.95 - 4.07. Therefore, it can be concluded that respondents considered factors related to organizational inertia and organizational power to be more important than factors related to the perceived benefits of blockchain technology.

**Hypothesis 4:** Inter-organizational trust has a positive effect on inter-organizational relationships.

At a significant level of p-value <0.05, the research results support the hypothesis that inter-organizational trust has positive impact on the inter-organizational relationships. The regression coefficient of the independent variable is 0.427, which is consistent with the research of Akrout and Rocca (2019) that studied inter-organizational trust related to customer and supplier. The research found that Inter-organizational trust has a significant influence on relationship between customer and supplier. Similarly, Schmidt and Schreiber (2019) studied inter-organizational trust and found that the process of building inter-organizational trust leads to a positive relationship in building inter-organizational relationships which based on trust.

**Hypothesis 5:** Inter-organizational trust has a positive effect on intention to adopt blockchain technology.

At a significant level of p-value <0.05, the research results support the hypothesis that inter-organizational trust has positive impact on the intention to adopt blockchain technology. The regression coefficient of the independent variable is 0.340 which is consistent with the research of Alsmadi et al. (2023) and Seshadrinathan and Chandra (2021) that inter-organizational trust has a significant positive effect on intention to adopt blockchain technology.

**Hypothesis 6:** Inter-organizational relationships have a positive effect on intention to adopt blockchain technology.

At a significant level of p-value <0.05, the research results support the hypothesis that inter-organizational relationships have positive impact on the intention to adopt blockchain technology. The regression coefficient of the

independent variable is -0.290, This counterintuitive outcome beckons for a nuanced exploration. This result aligns intriguingly with Hypothesis 2, which postulated that organizational inertia exerts a negative influence on inter-organizational relationships.

The connection between inter-organizational relationships and organizational inertia can be contextualized within the framework of IT assimilation theory. IT assimilation, encompassing the integration of information technology into an organization's operational fabric, relies on the organization's capability to acquire and effectively leverage technological resources (Wang et al., 2019). Notably, past research highlights a common hurdle in the adoption of blockchain technology—the challenge of comprehending and harnessing its full potential. Organizations, in their pursuit of technology-enabled transformation, necessitate supportive resources to facilitate adept technology usage and engender transformative learning (Treiblmaire et al., 2021). Furthermore, akin to this notion, the study delves into prior relevant research indicating that a key impediment to the adoption of blockchain technology is the lack of awareness about its manifold advantages.

Interestingly, the observed outcome finds resonance with the concept of organizational change stemming from inter-organizational relationships. This proposition, as suggested by Radziwon and Bogers (2019), underscores those transformations within an organization often germinate from collaborative synergies within its ecosystem. These collaborations, forged in response to external changes, manifest as innovations that usher in organizational shifts. The confluence of these concepts aligns harmoniously with Rzepka's (2019) contention that inter-organizational collaboration serves as a potent catalyst for organizational change, facilitating the exchange of experiences and fostering innovation adoption.

**Hypothesis 7:** Perceive benefit of blockchain technology has a positive effect on intention to adopt blockchain technology.

At a significant level of p-value $<0.05$, the research results support the hypothesis that Perceive benefit of blockchain technology has negative impact on the intention to adopt blockchain technology. The regression coefficient of the independent variable is 0.481, which is consistent with the research by Rzepka (2019), which states that sharing experiences and utilizing innovation through collaboration between organizations is an effective tool for organizational change. Organizations related to the Ministry of Agriculture and Cooperatives, both public and private sectors, recognize that blockchain technology can provide benefits to their respective organizations, as well as effectively respond to national or organizational strategies. This maximizes benefits to their own organizations, as most organizations do not have a system for exchanging information between units. Therefore, blockchain technology can help solve these problems by increasing transparency, reducing complexity in management, and providing greater access to and sharing of high-quality and accurate data (Catherine & Pierre, 2017).

## 5. Conclusion and Recommendations

### 5.1 Conclusion

The analysis of the factors and hypothesis testing according to the research framework (Figure 1) yielded the following key findings:

Hypothesis 1A, which proposed a negative effect of mediated power on inter-organizational trust, was not supported by the research. However, hypothesis 1B, suggesting a positive effect of non-mediated power on inter-organizational trust, received support. Respondents placed greater importance on non-mediated power, as evidenced by average values ranging from 3.68 to 3.85. This finding aligns with previous studies emphasizing the positive impact of non-mediated power on inter-organizational trust.

Regarding hypothesis 2A and 2B, which examined the effects of relational mechanism and organizational pressure on inter-organizational relationships, the research did not support these hypotheses. However, hypothesis 2C, indicating a negative effect of organizational inertia on inter-organizational relationships, was supported. Respondents attributed more significance to organizational inertia, with average values ranging from 3.87 to 4.35. This aligns with previous research highlighting the negative impact of organizational inertia on inter-organizational relationships.

Hypothesis 3, proposing a positive effect of the perceived benefit of blockchain technology on inter-organizational relationships, was not supported by the research findings. Respondents considered factors related to organizational inertia and power to be more significant than the perceived benefits of blockchain technology.

On the other hand, hypothesis 4, suggesting a positive effect of inter-organizational trust on inter-organizational relationships, was supported. The research findings demonstrated a positive relationship between inter-organizational trust and relationships.

Furthermore, hypothesis 5, indicating a positive effect of inter-organizational trust on the intention to adopt blockchain technology, was supported by the research. Inter-organizational trust was found to have a significant positive impact on the intention to adopt blockchain technology.

Lastly, hypothesis 6 proposed a positive effect of inter-organizational relationships on the intention to adopt blockchain technology. However, the research findings revealed a negative impact, indicating that inter-

organizational relationships may restrain the intention to adopt blockchain technology.

These findings provide valuable insights into the relationships between power, trust, inter-organizational relationships, and the intention to adopt blockchain technology in the agricultural sector. Understanding these dynamics can inform organizations and policymakers in their decision-making processes.

### 5.2 Recommendations

Based on the research findings, the following recommendations are provided:

1) Organizations should recognize the importance of non-mediated power in building inter-organizational trust. Emphasizing collaboration and cooperation rather than coercion can foster trust among organizations.

2) It is crucial to address organizational inertia and promote change readiness within organizations. Efforts should be made to overcome resistance to change and foster a culture of innovation and adaptability.

3) Stakeholders should focus on promoting the perceived benefits of blockchain technology to enhance inter-organizational relationships. This can be achieved through awareness campaigns, knowledge sharing, and showcasing successful case studies.

4) Inter-organizational trust-building initiatives should be prioritized to encourage the adoption of blockchain technology. Building trust through transparent communication, mutual respect, and shared goals can positively influence organizations' intention to adopt the technology.

### 5.3 Limitations and Further Study

While this research contributes valuable insights, it is important to acknowledge its limitations. The study focused on specific categories of participants, and future research should consider expanding the sample to include a broader range of stakeholders such as farmers, agricultural cooperatives, and industry associations. Additionally, the research was conducted in a specific context, and further studies in different industries and countries would provide a more comprehensive understanding of the factors influencing the adoption of blockchain technology. Lastly, exploring the role of other factors, such as organizational culture and regulatory frameworks, would enrich our understanding of the interplay between trust, relationships, and technology adoption.

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## Appendixes

**Appendix 1:** Variable Measurements

| Factor | Variable | Question |
|---|---|---|
| Perceived Benefits of Blockchain | P3Q1PBB1 | Helps reduce the budgetary costs of the government, saving expenses on inspection and supervision. |
| | P3Q1PBB2 | Helps minimize inaccuracies, both in operational and economic aspects, ensuring service users' confidence in the accuracy and integrity of the received data. |
| | P3Q1PBB3 | Helps optimize cost efficiency in financial processes. |
| | P3Q1PBB4 | Helps reduce redundancy and streamline workflows, enabling easier and faster access, storage, and sharing of data. This reduces the time spent searching for and processing information, resulting in more efficient operations. |
| | P3Q1PBB5 | Helps in data processing, verification, and control, enabling more efficient management and planning of work processes. |
| | P3Q1PBB6 | Facilitates seamless coordination and collaborative work among service users, allowing for quick responsiveness to the needs of the public with high efficiency. |
| | P3Q1PBB7 | It helps improve the efficiency of agricultural management and planning, particularly in data collection for cultivation and production, analysis of production planning, and enhancing internal management or government policies. This enables the effective implementation of agricultural and cooperative strategies, contributing to the advancement of Thailand's agriculture sector. |
| Relational Mechanism | P3Q2RM1 | The transparency and security of blockchain technology enable your organization to trust in data management, ensuring confident and efficient operational processes. |
| Relational Mechanism | P3Q2RM2 | The integration of data through the electronic systems of your organization is important for fostering relationships between organizations. It facilitates the efficient utilization of shared data for mutual benefits. |
| | P3Q2RM3 | The integration of information systems within your organization and with other organizations is important for fostering good relationships between them. It enables both parties to collaborate effectively, coordinate their efforts, and utilize shared data efficiently. |
| Organizational Pressure | P3Q2OP1 | Other relevant organizations are using technology as a driving force to push for improvements in your organization's technology and operational processes, aiming for greater efficiency and effectiveness |
| | P3Q2OP2 | The increasing trend of using blockchain technology for management purposes may lead to other related organizations adopting the technology to enhance their management efficiency. |
| | P3Q2OP3 | The affiliated organizations are likely to offer support to your organization if you integrate and adopt blockchain technology as part of your organizational management practices. |
| Organization Inertia | P3Q2OI1 | Government support is vital for the successful adoption and implementation of blockchain technology in organizational management. It requires the development of supportive policies, resources, and fostering a culture of trust and understanding at all levels. |
| | P3Q2OI2 | Efficient communication systems are vital for effective organizational management. |
| Organization Inertia | P3Q2OI2 | Your organization utilizes internet-based platforms and electronic systems to ensure fast, |
| | P3Q2OI2 | Efficient communication systems are vital for effective organizational management. Your organization utilizes internet-based platforms and electronic systems to ensure fast, accurate, and efficient interdepartmental communication, enhancing overall operational efficiency. |
| | P3Q2OI3 | Your organization demonstrates a strong IT infrastructure, enabling efficient adoption of blockchain technology for effective management and operational excellence. |
| Inter-organizational Trust | P3Q3IOT1 | The organization has fostered trust and built strong and enduring relationships among efficient and effective partners through the implementation of a trust-building system. |
| | P3Q3IOT2 | The organization has successfully built and nurtured trusted relationships with relevant stakeholders, leading to productive and efficient collaboration. |
| | P3Q3IOT3 | The organization fosters trust and cooperation with other entities, leading to strong interorganizational relationships. |
| Inter-organizational Relationship | P3Q4IOR1 | Negotiation fosters effective collaboration and mutually beneficial outcomes among organizations, enhancing operational efficiency and cultivating strong relationships. |
| | P3Q4IOR2 | Flexibility and adaptability in inter-organizational collaboration are crucial for effective working relationships and instilling |

| Factor | Variable | Question |
|---|---|---|
| | | confidence among participating organizations. |
| Inter-organizational Relationship | P3Q4IOR3 | Your organization's steadfast commitment to maintaining ongoing relationships with other entities is crucial in fostering trust and building a positive organizational reputation. |
| | P3Q4IOR4 | The organization prioritizes building and maintaining strong relationships with other entities, fostering trust and mutual understanding for efficient collaboration. |
| Intention to Adopt Blockchain | P3Q5IAB1 | The organization is dedicated to studying and exploring the use of blockchain technology for data exchange among entities. |
| | P3Q5IAB2 | Implementing blockchain technology in organizational management can enhance efficiency and streamline operations, resulting in improved effectiveness and performance. |
| | P3Q5IAB3 | The organization is committed to utilizing technology for efficient inter-organizational data exchange. |
| Mediated Power | P3Q6MP1 | Effective utilization of blockchain technology for inter-organizational data exchange is key to receiving positive responses from other entities. |
| | P3Q6MP2 | Failure to adopt blockchain technology for inter-organizational data exchange may hinder favorable responses from other entities, limiting the potential benefits for your organization. |
| | P3Q6MP3 | Failure to adopt blockchain technology for inter-organizational data exchange may lead to other entities, including affiliated and external ones, exercising their power to unilaterally terminate agreements or contracts with your organization. |
| Non-mediated Power | P3Q7NMP1 | Your organization demonstrates a strong alignment with other relevant entities in terms of operational practices, indicating a shared approach to work methodologies. |
| | P3Q7NMP2 | The organization operates independently, implementing its own plans and strategies without relying on external collaboration or assistance from other units. It has the flexibility to choose and utilize suitable methods and tools based on its specific needs, without seeking authorization or support from external entities. |
| | P3Q7NMP3 | The organization trusts and recognizes the expertise of other relevant units, valuing their competence in carrying out their roles and responsibilities. |