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The Readiness of Private Higher Education Institutions in Indonesia to Adopt Blockchain Technology in Accounting Information Systems

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Abstract

This study aims to evaluate the readiness of Private Higher Education Institutions (HEI) in Indonesia to adopt blockchain technology. Using the Unified Theory of Acceptance and Use of Technology (UTAUT) model, this research explores the factors influencing the acceptance of blockchain technology, including Relative Advantage, Accounting Information Quality, Trust, Performance Expectancy, Effort Expectancy, and Intention to Use. Blockchain, as a decentralized, transparent, and secure technology, has the potential to enhance the accounting systems in Private HEIs. However, the adoption of this technology in the education sector remains at an early stage. This study uses a quantitative approach, with surveys distributed through questionnaires to financial department heads in accredited Private HEI across Indonesia. The findings show that Relative Advantage and Accounting Information Quality have a significant positive impact on Performance Expectancy, while Trust strongly influences Effort Expectancy. Performance Expectancy and Effort Expectancy contribute to the Intention to Use blockchain in Private HEI. This study contributes to the literature on blockchain adoption, particularly in the context of higher education, by emphasizing the potential of this technology to create more efficient, transparent, and secure accounting systems in Private HEI. These findings aim to provide practical guidance for higher education institutions and stakeholders in preparing for successful blockchain implementation.

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Introduction

New technologies bring significant changes across almost all sectors, particularly in accounting. This is marked by the advancements of the 4.0 Revolution, which has introduced various cutting-edge technologies such as cloud computing, artificial intelligence, the internet of things, robotics, big data, and blockchain (Falwadiya & Dhingra, 2022). These emerging technologies are expected to have a significant impact on business processes, including accounting information systems (Abu Afifa et al., 2023; Dai & Vasarhelyi, 2017). According to Trabulsi (2018), many organizations strive to increase profits, market share, and service quality by utilizing information technology. Accounting Information Systems (AIS) play a crucial role in this process by serving as a vital internal information source. AIS supports accurate decision-making, which is essential for achieving organizational goals. Therefore, the implementation of AIS can enhance organizational performance and operational efficiency.

One of the technologies that has brought significant changes to human life in recent years is the development of blockchain technology (Hendriyati et al., 2023). Blockchain was initially introduced as a peer-to-peer ledger to record various Bitcoin cryptocurrency transactions. Blockchain transactions in the public ledger contain verifiable records, and once information is entered, it cannot be altered or deleted in the future. According to Choi and Siqin (2022), there are five distinct phases of blockchain development, starting from Blockchain 1.0 to Blockchain 5.0. Blockchain 1.0 focuses primarily on cryptocurrencies and the financial sector. Smart Contracts, part of Blockchain 2.0, enable computer programs to automatically execute various contractual terms. Blockchain 3.0 emphasizes decentralization for purposes such as transparency. Blockchain 4.0 focuses on integrating AI, data analytics, and other Industry 4.0 technologies to create an intelligent blockchain. This Blockchain 4.0 replaces intermediaries and facilitates real-time verification (Bhaskar et al., 2020).

Blockchain technology offers various benefits, including security, decentralization, transparency, and immutability (Bhaskar et al., 2020). These outstanding features make blockchain a popular choice for applications in various sectors, such as finance (Häkkinen & Koskinen, 2023), government (Alketbi et al., 2018), education (Mahankali & Chaudhary, 2020), healthcare (Mettler, 2016), tourism (Rashideh, 2020), energy (Andoni et al., 2019), public services (Akaba et al., 2020), banking (Martino & Martino, 2021), and business (Morkunas et al., 2019). Although blockchain technology has begun to be adopted in various fields, in-depth research on its use in accounting information systems in the education sector, particularly in higher education, is still limited.

The implementation of blockchain technology in education remains at an early stage. Blockchain technology has been specifically engineered to meet the needs and applications of the education sector. One example is the EduCTX platform, which is built on blockchain technology. EduCTX serves as a decentralized system for the transfer and assessment of higher education credits. This system is trusted and globally recognized by students, higher education institutions (HEIs), and other stakeholders such as companies, institutions, and organizations (Turkanović et al., 2018). Blockchain technology in education is used for issuing, certifying, and distributing certificates (diplomas) (Bhaskar et al., 2020; Gräther et al., 2018). However, as technology advances and transactions become more complex, cross-regional or international transactions in education are also evolving. This necessitates collaborative efforts from all relevant parties to create a trustworthy, honest, transparent, and informative accounting information system. Such a system serves as a fundamental pillar for achieving accountability and the sustainability of financial management in educational institutions (Abu Afifa et al., 2023).

As advancements continue, several studies have explored the application of blockchain in HEIs. Dajani and Yaseen (2016) highlight the importance of an integrated accounting information system to improve operational efficiency and facilitate better decision-making in HEIs. Furthermore, Yang (2022) proposes a comprehensive blockchain platform model for financial management in HEIs. This platform consists of three layers: service, application, and foundation, each responsible for providing different services. Users, such as students and academic staff, can log in using computers or mobile devices with their identification cards. Once logged in, they can perform various business processes through a mobile application connected to financial control modules. These modules include features such as personnel management, budget management, and financial reporting. Additionally, the platform supports information exchange and integration of different management systems within the university, ensuring resource sharing and preventing issues related to uneven information distribution. To support decision-making, the platform is also equipped with a data analytics system that monitors revenues, expenses, and investments, ensuring effective and transparent financial management in the university.

Blockchain technology has rapidly evolved and been widely adopted across various industries in recent years. In the financial sector, blockchain has transformed payment and investment systems through cryptocurrencies and smart contracts, enabling decentralized transactions without intermediaries (Nakamoto, 2008; Zheng et al., 2018). In supply chain management, this technology enhances transparency and efficiency, spanning from producers to consumers (Köhler & Pizzol, 2019; Saberi et al., 2019). The healthcare sector has also leveraged blockchain for more secure and efficient medical data management (Agbo et al., 2019; Angraal et al., 2017). Meanwhile, the energy industry uses blockchain to facilitate renewable energy trading between users and optimize power grid management (Ahl et al., 2019; Andoni et al., 2019).

Although blockchain adoption continues to grow across multiple sectors, research linking this technology to higher education remains limited. Most existing studies focus on diploma verification or digital certificates (Grech & Camilleri, 2017). Some preliminary research has explored the potential of blockchain to enhance student data security and administrative efficiency (Alammary et al., 2019; Turkanović et al., 2018), yet comprehensive implementation within university management remains underexplored.

This gap presents an opportunity for research that thoroughly examines how blockchain can be integrated into higher education management systems. Such studies must consider not only the technological aspects but also the organizational, economic, and social impacts (Casino et al., 2019; Ølnes et al., 2017). Therefore, this research offers novelty in addressing the existing literature gap while providing practical contributions for blockchain-based innovation in higher education management.

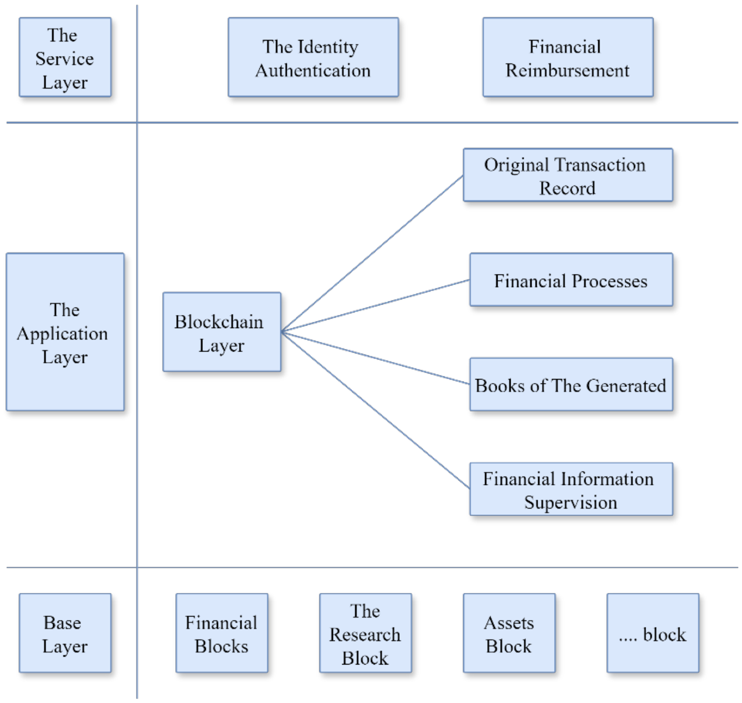

Figure 1. Financial sharing service model platform of colleges and universities.

The current understanding of blockchain technology remains limited, making it essential to elaborate on the literature regarding the adoption of blockchain technology (Falwadiya & Dhingra, 2022**).** This study introduces new insights by examining the use of blockchain technology in accounting systems within Indonesian higher education institutions, a field that has been underexplored. The study employs UTAUT to understand how blockchain technology is applied in higher education institutions. The contribution of this research lies in enriching the literature on the use of integrated adoption models while providing higher education institutions and stakeholders with insights into the factors influencing blockchain technology adoption, thus improving the quality of technological systems in the education sector. This study is expected to contribute to the development of more transparent and secure accounting systems in the education sector and offer practical guidelines for implementing blockchain technology in educational institutions.

Literature Review

Hypothesis Development

The Relationship Between Relative Advantage and Performance Expectancy

Relative advantage as the degree to which an innovation is perceived to be superior and more advantageous compared to the idea or product it replaces **(**Rogers et al., 2014**).** According to Iacovou et al. (1995), relative advantage requires a comparative analysis between existing technologies and the proposed one, along with an assessment of the perceived benefits after adoption. The greater the perceived difference, the higher the likelihood that an organization will have a positive perception of adopting the new technology. Venkatesh et al. (2003) introduced the concept of performance expectancy in the UTAUT model, which is defined as the degree to which individuals believe that using a system will help them improve their job performance. This research indicates that performance expectancy is a significant predictor of behavioral intention to use technology. When users recognize that a technological innovation offers substantial relative advantages (e.g., in terms of efficiency, accuracy, or ease of use), they are more likely to develop a stronger belief that adopting the innovation will positively impact their job performance (Davis, 1989). Therefore, a high relative advantage is likely to enhance performance expectancy.

H_1: Relative Advantage positively influences Performance Expectancy.

The Relationship Between Accounting Information Quality and Performance Expectancy

Accounting Information Quality is a critical aspect of a company's financial reporting process, as it influences the reliability, relevance, and usefulness of the information provided to stakeholders (Alkafaji et al., 2023). In recent years, blockchain technology has emerged as a solution to enhance the security of accounting information quality. Blockchain is a decentralized, distributed, and immutable digital ledger that records every transaction on multiple computers within a network (Yıldırım & Kelten, 2021). By utilizing blockchain features such as transparency, security, and easy traceability, companies can improve the accuracy, reliability, and timeliness of accounting information (Fanning & Centers, 2016). Dai and Vasarhelyi (2017) argue that blockchain technology in accounting can enhance data reliability, improve the auditing process, and reduce fraud risks. These advancements could significantly impact the quality of accounting information, particularly in higher education institutions, where transparency and accountability are vital to maintaining stakeholder trust and securing funding (Wu et al., 2019).

Given this potential, it is not surprising that attention is also drawn to performance expectancy, which, as defined in the UTAUT, refers to the extent to which individuals believe that using a system or technology will help them achieve better performance in their work or studies (Venkatesh et al., 2003). Recent research indicates that blockchain technology usage in higher education can enhance performance expectancy. For instance, Wei et al. (2021) found that implementing blockchain-based academic record management systems can improve the reliability, transparency, and security of student records. Han et al. (2018) also state that utilizing blockchain platforms in university administration and student services can streamline processes, reduce bureaucratic delays, and improve the overall user experience, thus increasing performance expectancy among students and staff.

H_2: Accounting Information Quality positively influences Performance Expectancy.

The Relationship Between Trust and Effort Expectancy

In the adoption of blockchain in higher education, user trust and expectations are critical. Trust in the blockchain system enhances the belief that the technology is easy to use. Jariyapan et al. (2022) demonstrate that positive perceptions of blockchain security influence users' intention to adopt the technology. When users feel secure, they are more likely to perceive the technology as easier to understand. Bélanger and Carter (2008) highlight the role of trust in reducing risk and increasing perceived ease of use. Venkatesh et al. (2003) assert that effort expectancy influences the intention to use new technology. Dai and Vasarhelyi (2017) suggest that technology adoption is influenced by users' trust levels. In the context of higher education, building trust is essential for blockchain adoption, as it can simplify administrative processes. Educating stakeholders about the benefits of blockchain fosters trust and raises stakeholder expectations. Wu et al. (2019) note that blockchain transparency enhances trust. Therefore, institutions should prioritize building trust and engaging users in the implementation process to increase technology adoption.

H_3: Trust positively influences Effort Expectancy.

The Relationship Between Performance Expectancy and Intention to Use

Performance expectancy, as defined in the UTAUT, refers to the extent to which individuals believe that using a system or technology will help them achieve better performance in their work or studies

(Venkatesh et al., 2003). Recent studies show that using blockchain technology in higher education can enhance performance expectancy. Intention to use reflects an individual's desire or intention to adopt a technological system (Davis, 1989). Furthermore, Venkatesh et al. (2003) link various behavioral technology models and conclude that factors such as performance expectancy, social influence, and facilitating conditions directly or indirectly impact intention to use.
H_4: Performance Expectancy influences Intention to Use.

The Relationship Between Effort Expectancy and Intention to Use
The ease of using a technology significantly influences individuals' willingness to adopt it within the framework of the UTAUT (Venkatesh et al., 2003). This is also supported by Davis (1989), who explains that if people find a technology easy to use, they are more inclined to adopt it. A study by Hameed et al. (2019) indicates that the ease of use of a technology can impact individuals' decisions to adopt it, particularly in the educational sector. In this context, ease of use becomes a crucial factor in encouraging people to adopt new technologies such as blockchain. Chen et al. (2023) emphasize that if blockchain technology in education is made easier to use, individuals will be more willing to accept it, which will increase their motivation to adopt the technology. Thus, simplifying the use of this technology is essential to promote broader adoption.
H_5: Effort Expectancy influences Intention to Use.

The relationships among the variables in the model can be expressed through the Structural Equation Model (SEM) represented in Equation 1.

$$PE=\beta1RA+\beta2AIQ+\epsilon1$$
$$EE=\beta3T+\epsilon2$$
$$IU=\beta4PE+\beta5EE+\epsilon3$$

Based on the hypothesis development, the research model is formulated according to the illustration shown in Figure 2.

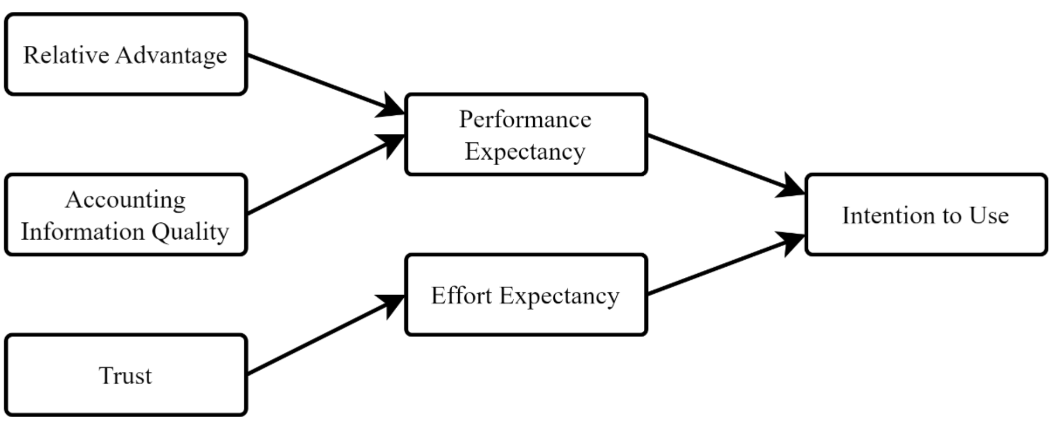

Figure 2. Research Model

Research Methods

Sample Selection
This research is a quantitative study utilizing a questionnaire survey method. The sample for this study consists of accredited Private HEI across several provinces in Indonesia. The focus on Private HEI is based on the findings of Hanim et al. (2023), Salman (2022), and Le et al. (2021), who highlight that private

universities must seek funding from various sources to support their financial sustainability. The issue of educational financing remains a significant challenge within the higher education system (Hanim et al., 2023; Murphy et al., 2019). Chaerunisyah (2021), in his study, reveals that there are several potential funding sources available to meet educational needs, including tuition fees from students, grants, and partnerships with specific institutions for research, community service, and other activities. The sampling technique used in this study is purposive sampling. The sample criteria include accredited private universities. Meanwhile, the selected respondents, who serve as the sampling units, must possess sufficient expertise and knowledge to answer the research questionnaire. These respondents are the heads of financial bureaus responsible for managing financial operations within the private universities.

Instrument Measurement

This study aims to examine and obtain empirical evidence regarding the factors influencing the intention to use a more transparent and secure accounting system in the education sector. Additionally, this research seeks to provide practical guidance for the implementation of blockchain technology in Private HEI in an effort to enhance the performance of Private HEI in Indonesia. To achieve these objectives, the researcher employs a survey using a questionnaire to collect data from various HEIs. This questionnaire utilizes a Likert scale ranging from 1 to 5. In this scale, a score of 1 indicates that the respondent "strongly disagrees" with the given statement, while a score of 5 signifies that the respondent "strongly agrees" with the statement. According to Revilla et al. (2014) and Hair et al. (2021), a 5-point Likert scale is chosen as the measurement tool. They suggest that in the context of research applying rating scales with agree-disagree categories, the use of a 5-point scale is an appropriate and effective choice. The rationale behind this recommendation is that a 5-point scale provides greater ease for researchers in interpreting the obtained data and in the statistical analysis process. Thus, it enables researchers to draw valid and reliable conclusions more easily. All questions included in the questionnaire have been adapted and sourced from previous studies to ensure that the measurement tool used is relevant and dependable.

Data Collection and Analysis

The collected data were subsequently analyzed using a statistical method known as Structural Equation Modeling (SEM). One of the techniques within this method is Partial Least Squares (PLS), which is a way to model latent variables and is often employed in research involving multiple dependent constructs (Fornell & Larcker, 1981). The PLS method has been applied in various studies in the fields of business and accounting (Ittner et al., 2003). According to Akbar et al. (2012), PLS is a suitable approach for this research because it requires fewer data assumptions, can be utilized with a relatively small sample size, and is not reliant on strong theoretical foundations.

Before testing the hypotheses using the PLS method, the researcher first conducted a Common Method Variance (CMV) test. This step is crucial to ensure that the data used are not influenced by potential biases or errors, such as reporting bias from respondents, question complexity, ambiguity, and scale format in the questionnaire (MacKenzie & Podsakoff, 2012). Hair et al. (2021) state that researchers need to follow specific procedures when evaluating the Outer Model and Inner Model using the PLS approach. the Outer Model serves as a measurement instrument that assists in assessing the validity and reliability of the constructs. Through this model, the relationship between indicator variables and the associated constructs can be analyzed. Conversely, the Inner Model, or structural model, illustrates the interactions between exogenous constructs and the endogenous constructs under study.

Result and Discussion

According to Memon et al. (2020), in research utilizing non-probability sampling methods, it is essential to analyze power to determine the minimum sample size required. In this hypothesis-testing study, mathematical calculations are performed to achieve 80% in identifying statistically significant results if the tested hypothesis is true (Sofyani, 2023) . The P-value for determining statistical significance is set at 0.05 (Hair, Hult, Ringle, & Sarstedt, 2021). The number of predictors refers to the maximum number of arrows pointing to the dependent variable; in this model, there are two predictors. A simulation to calculate the minimum sample size is conducted using the G*Power application, and it is determined that the minimum sample size needed is 68 Heads/Managers of The Finance Bureau. After distributing the questionnaire, 135 responses were received, exceeding the minimum sample size required.

Descriptive Statistics

The results of the descriptive analysis conducted in this study are clearly presented in Table 1. From the analysis, it was found that respondents' perceptions of each variable tended to be moderate. This is evident from the average values obtained, which range from 3 to 4. This indicates that respondents' perceptions regarding the research variables are relatively high. The variable performance expectancy has the highest average value of 4.06, indicating that Private HEI have a strong perception of the usefulness of blockchain for enhancing their performance.

Tabel 1. Descriptive Statistics

Construct	Min	Max	Mean	Std. Deviation
Relative Advantage	1.0	5.0	3.92	0.91
Accounting Information Quality	1.0	5.0	3.89	0.89
Trust	1.0	5.0	3.87	0.83
Performance Expectancy	1.0	5.0	4.06	0.86
Effort Expectancy	1.0	5.0	3.82	0.86
Intention to Use	1.0	5.0	3.84	0.90
Valid N=135				

Before conducting hypothesis testing, it is essential to ensure that each indicator in the study has been thoroughly evaluated through validity and reliability tests, as noted by Hair et al. (2019). The validity tests include convergent validity, which is expected to be interrelated and mutually supportive while demonstrating consistent values, and discriminant validity, which distinguishes between different constructs. Table 2 presents the results of the convergent validity test, where two primary metrics used are the outer loadings and average variance extracted (AVE). The recommended outer loading values should be above 0.5, while the AVE should also indicate values exceeding this threshold (Hair et al., 2019). If any indicator has a value below 0.5, that indicator should be removed. However, in Table 2, all indicators have met the recommended criteria, indicating that all indicators possess good validity for use in subsequent hypothesis testing.

Tabel 2. Convergent Validity Test Results

Codes	Indicators	Outer Loading
Relative Advantages - AVE: 0.8999		

RA1	Blockchain technology, as defined in the operational definition, is capable of facilitating improved decision-making processes for my higher education institution.	0.938
RA2	The implementation of blockchain technology, as specified in the operational definition, will enhance flexibility for my higher education institution.	0.953
RA3	The adoption of blockchain technology, as described in the operational definition, will contribute to the improvement of financial services at my higher education institution.	0.970
RA4	Blockchain technology, as outlined in the operational definition, will increase employee performance at my higher education institution.	0.930
Accounting Information Quality - AVE: 0.857		
AI1	With blockchain technology, as defined in the operational definition, updates to accounting information within my higher education institution's system can be executed in a timely manner.	0.866
AI2	Through the implementation of blockchain technology, as specified in the operational definition, updates to accounting information in my higher education institution's system will be more accurate.	0.889
AI3	With blockchain technology, as described in the operational definition, updates to accounting information in my higher education institution's system will be more relevant.	0.946
AI4	The adoption of blockchain technology, as outlined in the operational definition, will enhance the reliability of accounting information updates in my higher education institution's system.	0.946
AI5	With blockchain technology, as delineated in the operational definition, accounting information in my higher education institution's system can be verified.	0.951
AI6	Through the use of blockchain technology, as specified in the operational definition, accounting information in my higher education institution's system will be more dependable.	0.952
Trust - AVE: 0.788		
T1	Blockchain technology, as defined in the operational definition, can be considered trustworthy.	0.937
T2	Blockchain technology, as specified in the operational definition, is characterized by transparency and accountability.	0.934
T3	As a financial manager, I believe that in blockchain technology, as described in the operational definition, speculation in decision-making will not occur.	0.754
T4	Blockchain technology, as outlined in the operational definition, is inherently honest.	0.912
Performance Expectancy - AVE: 0.879		
PE1	Utilizing blockchain technology, as defined in the operational definition, will enable my higher education institution to enhance its financial services.	0.925
PE2	Implementing blockchain technology, as specified in the operational definition, will facilitate the provision of financial services at my higher education institution.	0.948
PE3	The adoption of blockchain technology, as described in the operational definition, will improve the efficiency and effectiveness of operations at my higher education institution.	0.954

PE4	Implementing blockchain technology, as outlined in the operational definition, will streamline the provision of accounting activities and financial services at my higher education institution.	0.949
PE5	The utilization of blockchain technology, as delineated in the operational definition, will enable my higher education institution to enhance its overall performance.	0.912
Effort Expectancy - AVE: 0.826		
EE1	My higher education institution will find it easy to utilize blockchain technology, as defined in the operational definition, for financial service activities.	0.885
EE2	I believe my higher education institution will find it straightforward to employ blockchain technology, as specified in the operational definition, for financial services.	0.911
EE3	It will be relatively simple for my higher education institution to develop expertise in using blockchain technology, as described in the operational definition.	0.924
EE4	My higher education institution will find it uncomplicated to learn and understand blockchain technology, as outlined in the operational definition.	0.916
Intention to Use - AVE: 0.851		
INT1	My higher education institution intends to implement blockchain technology, as defined in the operational definition, for application in financial services.	0.923
INT2	My higher education institution plans to initiate the use of blockchain technology, as specified in the operational definition, for implementation in accounting services.	0.94
INT3	Within the next 2-5 years, my higher education institution will adopt blockchain technology, as described in the operational definition, for financial services.	0.887
INT4	I believe that blockchain technology, as outlined in the operational definition, is feasible and can be adopted in the financial service systems of my higher education institution.	0.909
INT5	My higher education institution will implement blockchain technology, as delineated in the operational definition, in the future.	0.942

Furthermore, Table 3 presents the results of the discriminant validity test using the Fornell-Larcker criterion, which is widely recognized as a method for assessing construct validity in research (Hair et al., 2019). Good discriminant validity is essential to ensure the clarity and accuracy in identifying distinct constructs, thereby allowing researchers to draw accurate conclusions about the relationships between variables. According to Kline (2023), the application of this criterion in data analysis is crucial for maintaining the integrity and reliability of the research findings.

Tabel 3. Discriminant Validity Test Results (Fornell-Lacker)

	AI	EE	INT	PE	RA	T
Accounting Information Quality	**0.926**					
Effort Expectancy	0.834	**0.909**				
Intention to Use	0.790	0.809	**0.922**			
Performance Expectancy	0.846	0.816	0.851	**0.938**		

Relative Advantage	0.909	0.732	0.786	0.837	**0.948**	
Trust	0.879	0.783	0.794	0.832	0.853	**0.888**

Finally, the outer model testing conducted includes a reliability test. The measurement methods utilized encompass Cronbach's alpha and Composite reliability, with a minimum threshold set at 0.6 (Hair et al., 2019). Therefore, as presented in Table 4, all reliability test results have met the established criteria.

Tabel 4. Reliability Test Results

Construct	**Cronbach's alpha**	**Composite reliability (rho_c)**
Relative Advantage	0.962	0.973
Accounting Information Quality	0.966	0.973
Trust	0.909	0.937
Performance Expectancy	0.966	0.973
Effort Expectancy	0.930	0.950
Intention to Use	0.956	0.966

Tabel 5. Table of Determination Coefficients (R^2)

	R-square	**R-square adjusted**
Effort Expectancy	0.613	0.610
Intention to Use	0.763	0.760
Performance Expectancy	0.743	0.739

Table 5 presents the results of the coefficient of determination (R^2), which is used to evaluate the extent of variation explained by each endogenous construct within the model. This serves as an indicator of the explanatory power of the model (Shmueli & Koppius, 2011; Shmueli et al., 2019). Based on the conducted research, it is found that the levels of the variables Performance Expectancy, Effort Expectancy, and Intention to Use fall within the large category.

Tabel 6. Research Hypothesis Test

Hypothesis		**Path Coefficient**	**T-Statistic**	**Results**
Direct Effect				
Relative Advantage → Performance Expectancy	H1	0.394	3.324	Support
Accounting Information Quality → Performance Expectancy	H2	0.488	4.418	Support
Trust → Effort Expectancy	H3	0.783	16.058	Support
Performance Expectancy → Intention to Use	H4	0.571	6.285	Support
Effort Expectancy → Intention to Use	H5	0.344	4.038	Support

Based on the information from Table 6 regarding hypothesis testing, it is observed that the results for all direct effects hypotheses are supported. Both Relative Advantage and Accounting Information Quality have a positive impact on Performance Expectancy in Private HEI. Likewise, the direct influence between Trust and Effort Expectancy also indicates a positive direction. Furthermore, Performance Expectancy and Effort Expectancy present positive effects on the Intention to Use in Private HEI.

These analysis results demonstrate that all hypotheses are proven correct. The relative advantage of blockchain has a positive and significant impact on performance expectations when used on campus. This finding aligns with previous research by Kamble et al. (2019), which also found that relative advantage positively affects performance expectations in the use of blockchain within supply chains. In the realm of higher education, the benefits of blockchain, such as transparency, security, and efficiency, could enhance stakeholders' performance expectations. For instance, blockchain can accelerate and secure the process of verifying academic credentials and assist in managing research data, as explained by Turkanović et al. (2018) in their study on blockchain-based educational platforms.

In the context of the UTAUT framework, these findings are closely related to the construct of Performance Expectancy. UTAUT posits that Performance Expectancy is a key factor influencing behavioral intention to adopt new technology (Venkatesh et al., 2003). The relative advantage of blockchain positively impacting performance expectancy aligns with the premise of UTAUT, which suggests that individuals are inclined to adopt technologies they believe will enhance their performance. However, the moderate influence value (0.394) indicates that other factors within the UTAUT model, such as Effort Expectancy, Social Influence, and Facilitating Conditions, may also play significant roles in the adoption of blockchain in higher education. The complexity of technology, as revealed by (Chen et al., 2018), can be associated with Effort Expectancy in UTAUT, highlighting the necessity to consider ease of use in the implementation of blockchain. Recommendations for aligning implementation with institutional needs (Alammary et al., 2019) and based on real-world requirements (Grech & Camilleri, 2017) can be linked to Facilitating Conditions within UTAUT, underscoring the importance of organizational infrastructure and support in the adoption of technology.

Moreover, the quality of accounting information also has a positive and significant impact on performance expectancy in the adoption of blockchain technology in higher education. This finding is consistent with research by Appelbaum and Smith (2018), which underscores the importance of accounting information quality in improving efficiency and accuracy in financial reporting when using blockchain technology. In a higher education environment, blockchain can enhance the quality of accounting information through transparent and immutable transaction records. Within the UTAUT framework, the positive influence of accounting information quality on performance expectancy can be interpreted as a reinforcing factor for the Performance Expectancy construct. UTAUT posits that performance expectancy is a strong predictor of the behavioral intention to utilize technology (Venkatesh et al., 2003). The enhancement of accounting information quality through blockchain, as articulated by (Faccia et al., 2019) and (Abreu et al., 2018), can bolster users' confidence that this technology will enhance their performance. However, the identified challenges related to integration and compliance underscore the necessity of considering Facilitating Conditions within UTAUT. (Arndt & Guercio, 2020) and (Shen & Pena-Mora, 2018) emphasize the importance of a systematic approach, as well as considerations of mobility and accessibility, which can be linked to Effort Expectancy in UTAUT. This indicates that while the quality of accounting information enhances performance expectancy, ease of use and organizational support remain critical factors in the adoption of blockchain technology within higher education.

Furthermore, Trust has a significant positive influence on the effort expectancy of using blockchain technology in higher education. This finding aligns with research by Wong et al. (2020), which emphasizes that trust is a key factor in the acceptance of blockchain technology in the education sector. In a higher education context, when users trust blockchain technology, they are more likely to perceive it as less complex and feel more confident in using it. Within the UTAUT framework, the positive influence of trust on effort expectancy introduces a new dimension to the original model. Although trust is not explicitly mentioned in the original UTAUT, this finding indicates that trust can act as either a precursor or a moderator for the construct of effort expectancy. UTAUT defines effort expectancy as the degree of ease associated with the use of a system (Venkatesh et al., 2003). Research conducted by (Wong et al., 2020) and (Zheng et al., 2018) demonstrates that trust can diminish perceptions of complexity, aligning with the concept of effort expectancy within UTAUT. The significance of considering social and technical aspects (Aggarwal et al., 2019), as well as legal and ethical dimensions (Casino et al., 2019), in building trust can be linked to the constructs of facilitating conditions and social influence within UTAUT. This highlights the necessity for a holistic approach to the adoption of blockchain technology in higher education, which considers not only technological factors but also contextual and social elements that may impact the acceptance of the technology.

In addition, performance expectancy has a significant positive impact on the intention to use blockchain in higher education. This finding is consistent with research by Alazab et al. (2021), which identifies performance expectancy as one of the main factors driving the intention to adopt blockchain in education. Within higher education institutions, high expectations regarding blockchain performance may arise from its ability to enhance operational efficiency, data security, and transparency in various academic and administrative processes. Alammary et al. (2019), in their systematic review of blockchain usage in education, also note many potential benefits, including faster credential verification, better intellectual property rights management, and more transparent tracking of research funds.

This finding aligns closely with the UTAUT model, which identifies performance expectancy as one of the primary predictors of behavioral intention to use technology (Venkatesh et al., 2003). The significant effect coefficient of 0.571 underscores the central role of performance expectancy in the adoption of blockchain technology in higher education, consistent with the tenets of UTAUT. However, this value also indicates that other factors within UTAUT, such as effort expectancy, social influence, and facilitating conditions, also contribute to the intention to use. The importance of considering both technical and organizational aspects (Turkanović et al., 2018), as well as conducting comprehensive needs analysis and feasibility studies (Grech & Camilleri, 2017), can be linked to the facilitating conditions construct in UTAUT. This highlights that while performance expectancy is critical, the successful implementation of blockchain in higher education necessitates a holistic approach that considers all constructs within the UTAUT model.

The final hypothesis, Effort Expectancy has a significant positive impact on the intention to use blockchain in higher education, although this influence is smaller compared to performance expectancy. This finding is consistent with research by Kamble et al. (2019), which states that effort expectancy is an important factor in blockchain adoption, although its impact is not as strong as performance expectancy. In a higher education environment, the perception that the effort required is low (or the ease of use is high) can enhance the willingness to adopt blockchain. Holotescu (2018) also emphasizes the importance of understanding and addressing the complexities of blockchain technology to increase its adoption. This includes aspects such as ease of learning the system, integration with existing processes, and its use in daily activities.

These findings are consistent with the UTAUT model, which incorporates Effort Expectancy as one of the primary constructs influencing behavioral intention to use technology (Venkatesh et al., 2003). The positive influence of Effort Expectancy, although smaller than that of Performance Expectancy (0.344 vs. 0.571), aligns with the original UTAUT findings, indicating that Effort Expectancy tends to have a lesser impact compared to Performance Expectancy, particularly in the context of voluntary usage. The complexity of blockchain technology, as identified by (Alammary et al., 2019), underscores the significance of Effort Expectancy in the adoption of this technology in higher education. Recommendations to develop user-friendly interfaces (Arndt & Guercio, 2020) and to provide training and technical support can be seen as efforts to reduce Effort Expectancy, in line with the UTAUT model. However, the relatively lower impact of Effort Expectancy also suggests that, within the context of complex technologies such as blockchain, other factors like Performance Expectancy and Facilitating Conditions may play a more substantial role in shaping adoption intentions.

Conclusion

The use of blockchain technology in private universities in Indonesia is pivotal for advancing theories concerning technology acceptance. Research indicates that the benefits derived from blockchain, the quality of accounting information, and the level of user trust significantly influence users' outcome expectations, and the effort required to utilize this technology. These findings corroborate established theories such as the Unified Theory of Acceptance and Use of Technology (UTAUT), which highlight (Venkatesh et al., 2003) various critical factors that promote the adoption of new technologies. Furthermore, this study opens avenues for exploring how specific elements within the educational sector impact the application of technology adoption theories.

From a practical standpoint, the findings underscore the necessity of educating and enhancing user skills to maximize the potential of blockchain technology in higher education. Educational institutions should develop training programs aimed at improving users' understanding and competencies related to this technology. Additionally, management at these institutions must foster an enabling environment for the adoption of new technologies by providing adequate infrastructure and robust organizational support. Such measures can enhance transparency, security, and efficiency within their accounting information systems.

While this study yields valuable insights, several limitations warrant consideration. First, the sample was restricted to chief financial officers of accredited private universities, potentially limiting the generalizability of the results. Second, the application of blockchain in private universities is still nascent; thus, the current findings may evolve as the understanding and implementation of this technology progress. Third, relying solely on questionnaire-based approaches may not fully capture other perspectives or challenges associated with the implementation of this technology.

For future research, it is advisable to broaden the sample to include diverse stakeholders and conduct more comprehensive investigations into the infrastructure readiness and support necessary for blockchain adoption in education. Additionally, a longitudinal approach could provide meaningful insights into how the implementation of blockchain in private universities evolves over time.

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