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# Private Higher Education Intention in Adopting Blockchain Technology on Accounting Information System (AIS)

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**Research aims:** This study was conducted with the aim of testing and obtaining empirical evidence regarding the intention of private higher education institutions (HEIs) to adopt blockchain in accounting information systems (AIS) using the unified theory of acceptance and use of technology (UTAUT) model.

**Design/Methodology/Approach:** The sample of this research is private HEIs in Java that have been accredited "Very Good" and "Excellent," and the respondents representing the sample of this research are the head of private HEIs in the finance sector, and the head of the financial agency/institution/bureau of private HEIs selected through purposive sampling technique. Data were collected using a questionnaire and analyzed using the Partial Least Square method.

**Research findings:** The results indicate that performance expectancy, effort expectancy, and social influence have a positive impact on the intention of private HEIs to use blockchain in AIS.

**Theoretical contribution/Originality:** This research provides a theoretical contribution by confirming the UTAUT theory and expanding the literature related to the adoption of blockchain in AIS in private HEIs.

**Practitioner/Policy implication:** The findings of this research can serve as a basis for policy-making regarding the implementation of blockchain technology in the private HEIs education sector and offer valuable insights for private HEIs to prepare for the implementation of blockchain technology in AIS in the education sector.

**Research limitation/Implication:** The sample was limited to private higher education in Java, making the results not generalizable to a broader context.

**Keywords:** Accounting Information System; Blockchain; Private Higher Education; Unified Theory of Acceptance and Use of Technology

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## Introduction

Technology has become a main pillar in this rapidly advancing era (Bakator et al., 2024). As a crucial tool, technology not only accelerates various business and industrial processes but also opens new opportunities that were previously unattainable (Lee et al., 2018). Various traditional economic sectors, such as retail, transportation, manufacturing, services, and healthcare, have been affected by the rapid advancement of information and communication technology (Ramos & Queiroz, 2022). As a result, organizations face challenges in reevaluating their business models, striving to adapt and drive technological innovation, particularly in light of advancements in digital transformation (Warner & Wäger, 2019). In this context, blockchain emerges as a key technology that supports and accelerates digital transformation (Tapscott & Tapscott, 2017).

Blockchain can be defined as a digital ledger with a high level of cryptographic security, stored across multiple computers in a network, consisting of interconnected blocks of information that cannot be altered or deleted once validated (Wang et al., 2017). Transactions on a blockchain contain verifiable records; once information is entered, it cannot be changed or deleted in the future (Wang et al., 2017). Blockchain technology

eliminates the need for third-party intermediaries, allowing for direct verification and transactions. According to research conducted by Bhaskar et al. (2021), blockchain was first used as a peer-to-peer ledger to record cryptocurrency transactions for Bitcoin.

In the modern era full of changes and challenges, private higher education institutions (HEIs), as a part of the education sector, play an important role in guiding the development of individuals, making it one of the foundations that shape a person's character both in the present and in the future (Halim et al., 2022). According to research by Alammary et al. (2019), most private HEIs use blockchain only for the purpose of validating and sharing students' academic certificates or learning outcomes. However, researchers in the field believe that blockchain technology has much more to revolutionize this domain (Javaid et al., 2021). One such potential is that blockchain could enhance the central role of private HEIs as certification agents, providing greater learning opportunities to students (Nespor, 2019). This technology can improve budget management and transparency, enhance performance management, improve audit efficiency, and optimize financial management systems (Chen et al., 2018). Blockchain can improve budget management and transparency due to its decentralized and immutable nature so that every financial transaction can be recorded permanently and transparently (Sahib et al., 2024).

In Indonesia, the number of HEIs reached 3,107 in 2022, with 125 public HEIs and 2,982 private HEIs. Among private HEIs in Indonesia, Java is the dominant region with the largest number of HEIs. In 2021, Java has the HEIs number nationally at 1,489 units, most of which are private HEIs. Some HEIs in Indonesia have started to explore blockchain technology in their systems, although it is still in its early stages and not yet focused on accounting information systems (AIS). These implementations show significant potential to improve efficiency and security in the HEIs. In Java, many private HEIs have received “excellent” and “very good” accreditation from national accreditation bodies, indicating a fairly high standard of education. This provides opportunities for research to explore best practices in the application of technology in private HEIs.

The adoption of technology in HEIs is still relatively new (Che & Zhang, 2018). According to Komarudin (2022) thousands of private HEIs will struggle to improve the quality of their services in this digitalization era without adopting technology. On the other hand, educators will continue to be burdened by administrative tasks, making it difficult to enhance the quality of the Tri Dharma of HEIs. Despite the dominant number of private HEIs, only a few are accredited with an A rating. One major issue is the inability of private HEIs to carry out comprehensive digital adaptation. Currently, digitalization is still limited to the use of communication and audio-video applications in teaching without integrating all existing systems within the universities (Komarudin, 2022).

More broadly, blockchain can be implemented in AIS in HEIs (ALSaqa et al., 2019). According to ALSaqa et al. (2019), this application is supported by smart contract technology, which serves to store accounting data with a high level of security. The information stored can be easily and quickly shared with relevant parties, thus enhancing the effectiveness of accounting transaction verification. In this system, accounting data is recorded in a blockchain ledger, which is then integrated into the flow of the accounting information system (Nordgren et al., 2019). This allows the accounting system to produce financial reports in real time. Consequently, regulators, investors, banks, and auditors can cross-check to ensure the reliability of these transactions (Dai & Vasarhelyi, 2017; Faccia & Mosteanu, 2019).

The application of blockchain technology in private HEIs can strengthen the AIS used by private HEIs. Blockchain in AIS here can be interpreted as an information technology system built to guarantee the entity's internal financial transactions. The information technology system built to ensure the internal financial transactions of private HEIs, such as budget disbursement services, accountability for the use of funds by work units, and financial and performance audits, can be verified automatically based on the database blocks owned (such as research databases, budget databases, accounting databases, and others). By using blockchain, data and transactions processed in the AIS can become more secure, transparent, and resistant

to manipulation. This is in line with the purpose of AIS, which is to produce accurate and reliable information for planning, control, operations, and decision-making (Huy & Phuc, 2020).

Unified theory of acceptance and use of technology (UTAUT) is a recent technology acceptance model developed by Venkatesh in 2003. This model is designed to understand the factors that influence the intention to use technology and how the technology is used in real practice. According to Venkatesh et al. (2003), UTAUT has four main constructs that play an important role in influencing behavioral intentions and actual use of technology: the first construct is performance expectancy, the second construct is effort expectancy, the third construct is social influence, and the last is facilitating condition. This model not only considers individual factors that influence the intention and use of technology but also takes into account social influences and relevant environmental conditions.

In recent years, there has been a wealth of literature on blockchain adoption in HEIs. However, empirical quantitative research on this topic is limited. Most of the blockchain applications studied are qualitative in nature and only provide a conceptual, theoretical framework to better understand the adoption process (Lian et al., 2020). Therefore, quantitative research can provide support to previous studies conducted by Hashimy et al. (2023); Oliveira et al. (2016); Ramos and Queiroz (2022). This study aims to fill this gap by testing the UTAUT framework on the intention to adopt blockchain technology in HEIs. Specifically, the UTAUT antecedent factors tested include performance expectancy, effort expectancy, and social influence. This study will offer insights to university leaders and stakeholders regarding the adoption of blockchain technology to improve the quality of AIS in private HEIs.

## Literature Review and Hypotheses Development

### Unified Theory of Acceptance and Use of Technology (UTAUT)

UTAUT is a recent technology acceptance model developed by Venkatesh in 2003. This model is designed to understand the factors that influence the intention to use technology and how that technology is utilized in practice. According to Venkatesh et al. (2003), UTAUT consists of four key constructs that play a significant role in influencing behavioral intention and actual technology use. The first construct is performance expectancy, the second is effort expectancy, the third is social influence, and the last is facilitating condition.

### BlockchainTechnology

Blockchain technology, as an integral part of the Fourth Industrial Revolution, has emerged as a new phenomenon that has captured the world's attention. Initially, this concept was only known to a handful of individuals involved in information technology development. However, since 2016, interest in blockchain has surged dramatically, coinciding with the introduction of cryptocurrency exchanges (Bhaskar et al., 2021). Blockchain was first introduced by Nakamoto in 2008 and has since become a focal point for many businesses due to its potential to transform operational processes. Blockchain technology possesses several key characteristics, such as traceability, transparency, smart contracts, and security, making it highly valuable in various applications (Taherdoost, 2022).

### Blockchain Technology in Education

Previous research in the education sector has revealed various uses of blockchain in this field. Among them are certificate management (Xu et al., 2019) and digital guardianship approval (Gilda & Mehrotra, 2018). Blockchain has also been utilized to create collaborative learning environments (Hori & Ohashi, 2018) and manage competencies and learning outcomes (Duan et al., 2017). Additionally, blockchain technology supports learning systems (Tolbatov et al., 2018), competition management (Wu, 2021), and copyright management (Savelyev, 2018). Blockchain is beneficial in the administration of exams (Ito & O'Dair, 2019), evaluating students' professional skills (Zhao et al., 2019), and supporting lifelong learning (Mikroyannidis et

al., 2020). In the context of online education, blockchain helps enhance efficiency (Sun et al., 2018) and provides a better system for assessing students' abilities (Zhao et al., 2019).

**Blockchain Technology in AIS**

AIS is a system used to input, process, store, and report accounting data to produce information that is useful for decision-making (Huy & Phuc, 2020). According to Fatima et al. (2022), AIS is a crucial component in an organization because it helps identify potential benefits and enhance organizational performance. Blockchain in AIS here can be interpreted as an information technology system built to guarantee the entity's internal financial transactions. The information technology system built to ensure the internal financial transactions of private HEIs, such as budget disbursement services, accountability for the use of funds by work units, and financial and performance audits, can be verified automatically based on the database blocks owned (such as research databases, budget databases, accounting databases, and others). Research by ALSaqa et al. (2019) states that the implementation of blockchain technology in AIS enables the presentation of AIS data in real-time, continuous auditing and monitoring, and the detection of financial fraud.

**Hypotheses Development**

UTAUT is a theoretical model used to understand how organizations accept and use technology. New factors such as performance expectancy, effort expectancy, social influence, and facilitating conditions have been proposed within this main model (Afifa et al., 2022). Venkatesh et al. (2003) demonstrated that the intention to use new technology is significantly influenced by the aforementioned factors. Since then, an increasing number of studies have utilized UTAUT, as it is considered a comprehensive model for measuring the intention to use technology. This research aims to measure the intention to use blockchain as a new technology in AIS. In this study, the author focuses on three factors from the UTAUT theory which are performance expectancy, effort expectancy, and social influence.

**The Influence of Performance Expectancy on the Intention of Private HEIs to Adopt Blockchain Technology in AIS**

Performance Expectancy is one of the main constructs in the UTAUT model, developed to understand the factors influencing the adoption and use of technology. Performance Expectancy is defined as the degree to which an individual believes that using a system will help them achieve benefits in job performance (Venkatesh et al., 2003). Several indicators can be measured within performance expectancy, including increased productivity (Venkatesh et al., 2003), ease of credential verification (Turkanović et al., 2018), enhanced data security (Yli-Huumo et al., 2016) and efficiency of administrative processes (Alammary et al., 2019).

Previous studies have shown that performance expectancy is a strong predictor of the intention to use technology (Venkatesh et al., 2003). This aligns with research conducted by Dwivedi et al. (2019), which found that Performance Expectancy has a positive influence on the intention to use in their study related to the adoption of e-government technology. Based on this, the following hypothesis can be formulated:

***$H_1$**: Performance expectancy has a positive effect on the intention of private HEIs to adopt blockchain technology in AIS.*

**The Influence of Effort Expectancy on the Intention of Private HEIs to Adopt Blockchain Technology in AIS**

In the UTAUT model, effort expectancy is one of the main constructs that influences the intention to use and the actual use of technology. Effort expectancy plays a crucial role in determining whether an individual intends to use the technology. It is defined as the degree of ease associated with the use of a system (Venkatesh et al., 2003). The relationship between effort expectancy and intention to use has been

extensively researched in technology acceptance studies. Previous research indicates that effort expectancy positively influences intention to use (Oliveira et al., 2016).

Effort expectancy has a direct and positive effect on the intention to use technology. If blockchain technology in AIS at universities is perceived as easy to use, individuals will have the intention to adopt it. Based on this, the following hypothesis can be formulated:

***$H_2$**: Effort expectancy has a positive effect on the intention of private HEIs to adopt blockchain technology in AIS.*

**The Influence of Social Influence on the Intention of Private HEIs to Adopt Blockchain Technology in AIS**

Social influence refers to the degree to which an individual perceives that important others believe they should use a new system (Venkatesh et al., 2003). It is a significant construct in the UTAUT model that focuses on the influence of the surrounding environment on an individual's decision to use technology. Social pressure or encouragement from the social environment can significantly impact the intention to use technology.

Social influence pertains to the extent to which an organization feels that similar organizations around them affect their decision to adopt technology. This relates to social pressure or encouragement from comparable universities, which may compel other institutions to adopt blockchain technology in AIS. According to Tarhini et al. (2017) and Dwivedi et al. (2019), Social Influence has a positive effect on intention to use. Based on this, the following hypothesis can be formulated:

***$H_3$**: Social influence has a positive effect on the intention of private HEIs to adopt blockchain technology in AIS.*

Based on the theoretical framework and hypothesis, the research model is depicted in Figure 1

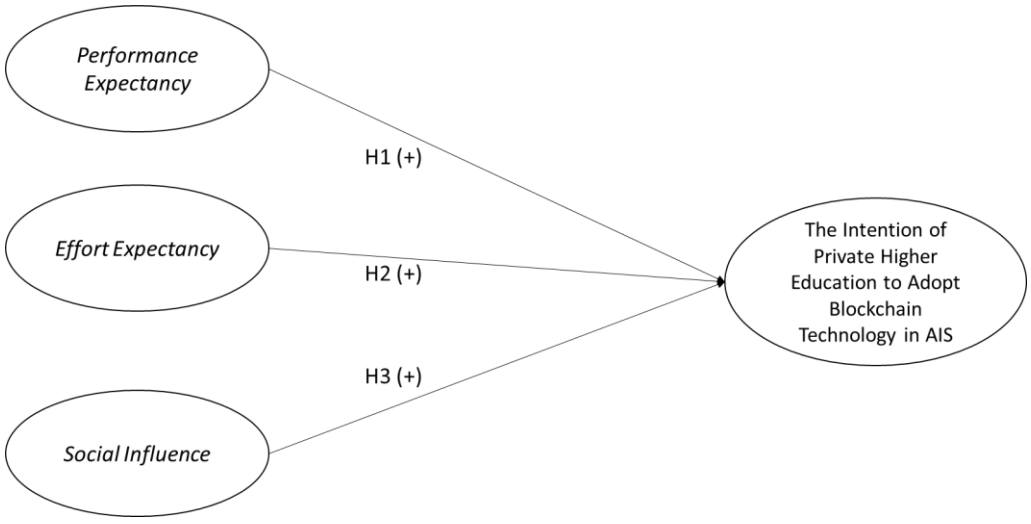


**Figure 1** Research Model

## Methodology

This research used primary data in the form of responses from the respondents. Based on its nature, this study employed a quantitative approach, meaning that the data were in numerical form, allowing for

objective and structured measurement. Research subjects consisted of populations and samples that were relevant to the research objectives. The population and sample in this study were private HEIs in Java Island selected through a purposive sampling technique, with the unit of analysis being the organization. Purposive sampling is a sampling method based on certain criteria. The population in this study were private HEIs in Java, and the sampling criteria were private HEIs that had achieved "excellent" and "superior" accreditation. This indicates that private HEIs with "excellent" and "very good" accreditation have met the quality standards set by accreditation agencies, so the data collected from these institutions are more reliable and representative. The respondents were the head of finance of private heis and the head of agency/ institution/bureau of finance at private HEIs, who have held their positions for at least one year. Respondents who have held their positions for at least one year are considered to have sufficient experience and a deep understanding of financial management in private HEIs. They have gone through various cycles of budgeting, auditing, and financial evaluation, so they are better able to provide accurate and relevant information.

Data analysis was then done using Partial Least Square (PLS) utilizing the SmartPLS version 4.0 software test tool. This study used PLS-SEM because of the exploratory research context. This data analysis technique allows for rejecting or supporting previous research results or theories (Hair et al., 2014). The stages of data analysis include Common Method Variance (CMV) test, descriptive statistical analysis, Confirmatory Tetrad Analysis (CTA) testing, convergent validity test, discriminant validity test, reliability test, coefficient of determination test, F-Square test, hypothesis testing, prediction test, and standardized root mean square residual (SRMR) test.

## Results and Discussions

Data collection was conducted through the distribution of questionnaires both directly and indirectly. Directly, the questionnaires were distributed to the relevant private HEIs, while indirectly, Google Forms were used in conjunction with a webinar event. All distributed questionnaires were returned at a rate of 100%, totaling 79 questionnaires that could be processed.

The characteristics of private HEIs are classified by province, type of institution, and accreditation. Table 1 presents the characteristics of the HEIs.

**Table 1** Characteristics of Private HEIs

| Description | Total | % |
|---|---|---|
| *Region* | | |
| Yogyakarta | 4.00 | 5.10 |
| Jabodetabek | 2.00 | 2.50 |
| Central Java | 46.00 | 58.20 |
| West Java | 9.00 | 11.40 |
| East Java | 18.00 | 22.80 |
| Total | 79.00 | 100.00 |
| *Type of Institution* | | |
| University | 45.00 | 57.00 |
| Institute | 9.00 | 11.40 |
| Polytechnic | 3.00 | 3.80 |
| College | 18.00 | 22.80 |
| Academy | 4.00 | 5.10 |
| Total | 79.00 | 100.00 |

**Table 1** Characteristics of Private HEIs (Cont.)

| Description | Total | % |
|---|---|---|
| *Accreditation* | | |
| Excellent/A | 8.00 | 10.10 |
| Very Good/B | 71.00 | 89.90 |
| Total | 79.00 | 100.00 |

Based on Table 1, the majority of the sample comes from Central Java, accounting for 58.20%, with universities making up 57.00% of the institutions. The majority have a "Very Good" (B) accreditation, with a percentage of 89.90%.

**Common Method Variance (CMV) Test**

This test was conducted using SPSS software. Data is considered free from error and bias if the CMV test result is less than 50%. Based on the CMV test results, a cumulative percentage of 44.571% was obtained, which is less than 50% (Podsakoff et al., 2003). This indicates that the data is free from bias and that no CMV occurred in the research model.

**Descriptive Statistical Analysis**

Descriptive analysis aims to describe the collected data (Sugiyono, 2012) by reviewing the maximum, minimum, mean, and standard deviation values for each variable. Data processing was conducted using SPSS Version 26. The results of the descriptive statistical analysis for each research variable are presented in Table 2.

**Table 2** Descriptive Statistic Result

| Variables | Theoretical Range | | | Actual Range | | | Std. Deviation |
|---|---|---|---|---|---|---|---|
| | Min | Max | Mean | Min | Max | Mean | |
| Intention of private HEIs to adopt blockchain technology in AIS | 5.00 | 25.00 | 15.00 | 10.00 | 25.00 | 18.937 | 3.46 |
| Performance Expectancy | 5.00 | 25.00 | 15.00 | 11.00 | 25.00 | 19.861 | 3.32 |
| Effort Expectancy | 4.00 | 20.00 | 12.00 | 8.00 | 20.00 | 14.961 | 2.50 |
| Social Influence | 3.00 | 15.00 | 9.00 | 7.00 | 15.00 | 11.519 | 1.99 |
| N | 79 | | | | | | |

The results of the descriptive statistical analysis are shown in Table 2. The actual average of the intention of private HEIs to adopt blockchain technology in AIS is 18.937, which is above the theoretical mean (15.00). However, the relatively high standard deviation of 3.4617 indicates significant variation in the intentions among respondents.

The actual average performance expectancy is 19.861, much higher than the theoretical mean (15.00), indicating that private HEIs have high expectations of the performance benefits of adopting blockchain in AIS. A significant standard deviation of 3.3156 suggests that although many have high expectations, there are still some differences in expectations among institutions.

The actual average effort expectancy is 14.961, above the theoretical mean (12.00), which means that many private HEIs feel that the effort required to adopt blockchain technology is slightly higher than anticipated. A lower standard deviation of 2.4984 compared to other variables indicates that the perception of effort is relatively more consistent among respondents.

Social influence on the adoption of blockchain technology also tends to be higher than expected, with an actual average of 11.519, higher than the theoretical mean (9.00). The relatively low standard deviation of

1.9862 indicates that respondents generally have similar perceptions regarding social influence in the decision to adopt this technology.

**Convergent Validity Test**

The convergent validity test is used to assess the relationship between constructs and latent variables. A variable is said to have good convergent validity if it has an Average Variance Extracted (Spichak et al., 2021) value greater than 0.5 and outer loadings values greater than 0.7 (Hair et al., 2014). Hair et al. (2014) also allow outer loading values between 0.5 and 0.7, provided that the AVE values and discriminant validity criteria are met.

In the context of this research, the convergent validity test helps confirm whether the indicators are well correlated with the intended latent constructs, such as Performance Expectancy, Effort Expectancy, and Social Influence, in the adoption of blockchain technology in the AIS. The AVE score measures how much variance of the indicators is captured by the construct compared to the variance due to measurement error. If the AVE and outer loading values meet the specified thresholds, it indicates that the measurement model has good convergent validity, ensuring that the indicators are sufficiently related to their respective latent constructs.

**Table 3** Outer loading and AVE

| Variables | Outer loading |
|---|---|
| *Intention of private HEIs to adopt blockchain technology in AIS (**AVE = 0.854**)* | |
| IAB1 | 0.918 |
| IAB2 | 0.932 |
| IAB3 | 0.930 |
| IAB4 | 0.901 |
| IAB5 | 0.938 |
| *Performance Expectancy (**AVE = 0.860**)* | |
| PE1 | 0.949 |
| PE2 | 0.930 |
| PE3 | 0.941 |
| PE4 | 0.938 |
| PE5 | 0.876 |
| *Effort Expectancy (**AVE = 0.763**)* | |
| EE1 | 0.859 |
| EE2 | 0.861 |
| EE3 | 0.892 |
| EE4 | 0.880 |
| *Social Influence (**AVE = 0.848**)* | |
| SI1 | 0.945 |
| SI2 | 0.940 |
| SI3 | 0.876 |

Based on the results of the convergent validity test in Table 3, all outer loading indicators have met the rules of thumb, which are greater than 0.7, and the AVE value is greater than 0.5. Therefore, it can be concluded that all indicators are valid and possess good convergent validity.

**Discriminant Validity Test**

The discriminant validity test aims to determine the extent to which a construct is distinct from other constructs (Hair et al., 2019). The Fornell-Larcker criterion and the Heterotrait-Monotrait Ratio (HTMT) are two widely accepted techniques for testing discriminant validity. According to the Fornell-Larcker criterion,

the square root of the AVE for each construct should be greater than the correlation with other latent constructs (Fornell & Larcker, 1981). Meanwhile, HTMT is used to measure the similarity between variables. Henseler et al. (2015) found that HTMT can achieve higher specificity and sensitivity levels compared to Fornell-Larcker, with the criterion that all constructs must be less than 0.85 (Hair et al., 2014).

**Table 4** Discriminant Validity Test Result (Fornell-Lacker)

| | IAB | PE | EE | SI |
|---|---|---|---|---|
| Intention of private HEIs to adopt blockchain technology in AIS | **0.873** | | | |
| Performance Expectancy | 0.765 | **0.924** | | |
| Effort Expectancy | 0.762 | 0.858 | **0.927** | |
| Social Influence | 0.742 | 0.752 | 0.761 | **0.921** |

Note: IAB = Intention to Adopt Blockchain; PE = Performance Expectancy; EE = Effort Expectancy; SI = Social Influence.

Based on Table 4, the results of the discriminant validity test using the Fornell-Larcker criterion have met the criteria, as the correlation values for each construct are higher in relation to themselves than with other constructs. Furthermore, based on the recommendation by Henseler et al. (2015), the HTMT value is considered a better measure for assessing discriminant validity compared to the Fornell-Larcker criterion.

**Table 5** Discriminant Validity Test Result (HTMT)

| | Ratio |
|---|---|
| The intention of private HEIs to adopt blockchain technology in AIS <-> Effort Expectancy | 0.824 |
| Performance Expectancy <-> Effort Expectancy | 0.820 |
| Performance Expectancy <-> Intention of private HEIs to adopt blockchain technology in AIS | 0.831 |
| Social Influence <-> Effort Expectancy | 0.818 |
| Social influence <-> Intention of private HEIs to adopt blockchain technology in AIS | 0.805 |
| Social Influence <-> Performance Expectancy | 0.815 |

Based on the HTMT test results in Table 5, the HTMT ratio values meet the criteria of being less than 0.85 (Hair et al., 2019). Therefore, it can be concluded that both convergent validity and discriminant validity have been fulfilled.

**Reliability**

The reliability test is used to assess the consistency and stability of the measurement tools by examining Cronbach's alpha and composite reliability values. The data is considered reliable if the values of cronbach's alpha and composite reliability meet the criteria of being greater than 0.6 (Hair et al., 2019).

**Table 6** Reliability Test Result

| Variables | Cronbach Alpha | CR |
|---|---|---|
| Intention of private HEIs to adopt blockchain technology in AIS | 0.957 | 0.958 |
| Performance Expectancy | 0.959 | 0.963 |
| Effort Expectancy | 0.896 | 0.897 |
| Social Influence | 0.910 | 0.916 |

Note: CR = Composite Reliability.

Based on the reliability test results in Table 6, all variables are reliable, with Cronbach's alpha and composite reliability values exceeding 0.6 (Hair et al., 2019). After meeting the criteria for convergent validity, discriminant validity, and reliability, the analysis can proceed to the inner model testing.

**Prediction Test**

Another way to assess the predictive accuracy of the PLS path model is by calculating the Q value and conducting a prediction test using PLSpredict to evaluate the strength of the prediction model (Hair et al., 2019).

**Table 7** Prediction Test Result (PLSpredict)

| Indicators | $Q^2$predict | PLS-SEM_RMSE | PLS-SEM_MAE | LM_RMSE | LM_MAE |
|---|---|---|---|---|---|
| IAB1 | 0.588 | 0.171 | 0.043 | 0.183 | 0.043 |
| IAB2 | 0.595 | 0.182 | 0.047 | 0.186 | 0.046 |
| IAB3 | 0.617 | 0.156 | 0.040 | 0.152 | 0.037 |
| IAB4 | 0.708 | 0.136 | 0.032 | 0.151 | 0.035 |
| IAB5 | 0.695 | 0.141 | 0.034 | 0.146 | 0.035 |

Based on the results in Table 7, it can be concluded that the $Q^2$ value for the endogenous variables is $0 < Q^2 < 1$, indicating a good level of observation. The prediction test results from PLSpredict in this study show that PLS-SEM-RMSE yields higher prediction errors compared to LM in terms of root mean squared error (RMSE) or mean absolute error (MAE), placing the prediction results of this study in the moderate category.

**The Coefficient of Determination ($R^2$)**

The testing of the structural model or inner model is conducted by examining the Adjusted R-Square or $R^2$ value. The Adjusted R-Square value indicates the ability of the exogenous variables to explain the variation in the endogenous variables. Below are the results of the Adjusted R-Square calculation. The adjusted R-square value is 0.774 for the intention of private HEIs to adopt blockchain technology in AIS, indicating that 77.4% of the variation in the intention to adopt blockchain can be explained by the independent variables in the model. Meanwhile, the remaining 22.6% is influenced by factors outside of this model.

**Hypothesis Test**

Hypotheses are considered supported when the p-value is less than the alpha level of 5% or 0.05. Additionally, since this is a one-tailed study that considers directionality, the coefficient (original sample) must align in direction with the hypothesis. Finally, the t-statistic must be less than 1.66. Furthermore, Table 8 shows the results of testing the direct effect. All variables have a positive effect on the Intention to Adopt blockchain technology in AIS. Furthermore, the Adjusted R2 of the research model is at a high level, which indicates the ability of exogenous variables to explain endogenous variables by 77.4%, which is considered a strong prediction (Chin et al., 2003). In addition, this research model is also concluded to be fit because the SRMR value is below 0.10 (Henseler et al., 2015).

**Table 8** Hypotheses Test Result

| | | Original Samples | T-statistic | p-value |
|---|---|---|---|---|
| Performance Expectancy → Intention of private HEIs to adopt blockchain technology in AIS | H1 (+) | 0.205 | 1.964 | 0.025 |
| Effort Expectancy → Intention of private HEIs to adopt blockchain technology in AIS | H2 (+) | 0.581 | 6.292 | 0.000 |
| Social Influence → Intention of private HEIs to adopt blockchain technology in AIS | H3 (+) | 0.158 | 1.711 | 0.044 |
| R Square Adjusted | 0.774 | | | |
| SRMR | 0.056 | | | |

**Discussions**

**The Influence of Performance Expectancy on Private HEIs Intention to Adopt Blockchain Technology in AIS**

The hypothesis test results for $H_1$ indicate that performance expectancy affects the intention of private HEIs to adopt blockchain technology in AIS. This finding aligns with research by Venkatesh et al. (2003) which shows that performance expectancy is a strong predictor of the intention to use technology. Similarly, Dwivedi et al. (2019) demonstrated that performance expectancy positively influences intention to use in their study related to e-government technology adoption.

Performance expectancy, one of the main constructs in the UTAUT model, is defined as the level of confidence that using a system will help achieve performance gains. This relates to the belief of financial leaders or heads of financial bodies/agencies at private HEIs that if they perceive blockchain technology to provide tangible benefits in terms of efficiency, effectiveness, or productivity in AIS performance, their intention to adopt blockchain will emerge.

The descriptive statistics test for performance expectancy reveals that the average perception of respondents regarding the extent to which blockchain technology in AIS is expected to enhance performance is quite high. The standard deviation indicates that although many have high expectations, there are still some differences in expectations among institutions. The results suggest that private HEIs in Java have a positive view of blockchain technology in AIS, believing it will assist in ensuring internal financial transactions such as budget disbursement services, accountability for fund usage by work units, and financial and performance audits that can be verified automatically.

**The Influence of Effort Expectancy Private HEIs' Intention to Adopt Blockchain Technology in AIS**

The hypothesis test results for $H_2$ indicate that effort expectancy positively affects the intention to use blockchain in AIS at private HEIs. This finding is consistent with research by Oliveira et al. (2016) and Afifa et al. (2022), which suggests that effort expectancy positively influences the intention to use technology. Effort expectancy refers to the perceived or anticipated ease of using technology, including users' perceptions of how difficult or easy it is to learn, operate, and apply in daily tasks (Chang, 2012).

The descriptive statistics test for effort expectancy shows that the actual average is above the theoretical average, indicating that the average respondent considers the use of blockchain in AIS relatively easy. It can be concluded that financial leaders or heads of financial bodies/agencies at private HEIs have a positive response to the ease of use of blockchain technology. The lower standard deviation compared to other variables indicates that perceptions of effort are relatively uniform among respondents. They believe that blockchain technology in AIS at private HEIs is easy to operate and apply, leading them to have the intention to adopt it.

**The Influence of Social Influence on Private HEIs Intention to Adopt Blockchain Technology in AIS**

The hypothesis test results for $H_3$ show that social influence positively affects the intention to use blockchain in AIS at private HEIs. This finding is in line with Tarhini et al. (2017) and Dwivedi et al. (2019), who stated that social influence has a positive effect on the intention to use technology. Social influence is an important construct in UTAUT, focusing on the environmental impact surrounding the decision to use technology. This social influence refers to the extent to which organizations feel that similar organizations around them influence their decision to use technology. This relates to social pressure or encouragement from similar private HEIs, prompting other institutions to feel the need to adopt blockchain technology in AIS.

The actual average from the descriptive statistics test for social influence is higher than the theoretical average, indicating that social influence in private HEIs' decisions to adopt blockchain technology is quite strong. The relatively low standard deviation also suggests that the majority of respondents share similar

views regarding the level of social influence in adopting blockchain technology. Based on these results, it can be concluded that financial leaders or heads of financial bodies/agencies at private HEIs believe that if many surrounding private HEIs have implemented blockchain in their AIS, it will affect their intention to adopt blockchain in similar systems.

## Conclusion

This study was conducted to test and obtain empirical evidence regarding the intention of private HEIs to use blockchain in AIS. The study was conducted at 79 private HEIs in Java. Based on testing and data analysis, it can be concluded that the variables performance expectancy, effort expectancy, and social influence have a positive effect on private HEIs' intention to adopt blockchain in AIS. This study contributes theoretically to confirm the UTAUT theory and expand the literature related to the application of blockchain in AIS in private HEIs. This study also provides insight to university leaders and stakeholders regarding the adoption of blockchain technology to improve the quality of AIS in private HEIs.

This study has several limitations, including the fact that the sample is only spread within the scope of private HEIs in Java, so the results of the study cannot be generalized more widely. Further research can be conducted at different HEIs, both private and public, in Indonesia.

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## Conflicts of interest

The authors declare no conflict of interest. The funders had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript, or in the decision to publish the results.