Interest in Using Cardless Withdrawal: Knowledge, Security and Ease of Transaction as Mediating Variables for BCA Mobile Users in Greater Surabaya

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Abstract
One of the advantages of mobile banking app technology is the ability to withdraw cash or money without a card. Many advantages and conveniences are offered by this feature, including reducing the risk of cards being swallowed and damaged, as well as making transactions safer and more efficient. The BCA cardless mobile method aims to make it easier for customers or users with different technological backgrounds to use. Therefore, ease of transactions is the best solution to meet the needs of cardless mobile banking users. But consumers also pay attention to security. Knowledge, security, and transaction convenience are the main components that influence user interest. The indirect influence is related to transaction ease as a mediating variable. This result is supported by the TPB theory, which states that transaction ease, security, and knowledge can shape attitudes and interest in technology use This study shows that ease of transaction is a mediating variable that relates knowledge and security to the interest in using cardless withdrawals.
Keywords: Cardless Withdrawal, Mobile Banking, Technology.

1. Introduction

In the midst of rapid developments in information technology, the banking sector has undergone significant transformation through the introduction of digital services. According to the Indonesian Internet Service Providers Association (APJII), the number of internet users in Indonesia is estimated to reach 221,563,479 in 2024, out of a total population of approximately 278,696,200 in 2023. Based on a study by APJII in 2024, the internet penetration rate in Indonesia reached 79%, representing an increase of 1.4% from the previous period (APJII, 2024). This growth enables customers to conduct banking transactions using smartphones, in accordance with the Financial Services Authority Regulation No. 12/PJOK.02/2018 regarding the provision of digital banking services (Financial Services Authority, 2018).

In today's digital era, banks are facilitating transactions without the need for physical ATMs. One of the key technological advancements in mobile banking applications is cardless withdrawal—a feature that allows users to withdraw cash without a physical debit card. This innovation offers numerous benefits, including enhanced security and efficiency, as well as reduced risk of technical issues such as cards being swallowed by ATMs or card chip failures (Fajriastuti & Arman, 2022).

Cardless withdrawal services were first introduced in 2018-2019 and are now offered by almost all banks, including Bank Central Asia (BCA) (PT Rintis Sejahtera, 2024). Santoso Liem, director of BCA, said, "There is a positive trend among customers to use cardless withdrawal services, especially in emergency situations when wallets are left behind and urgent cash withdrawals are needed. Customers can easily access the cardless withdrawal feature on BCA Mobile and easily withdraw money without a card at BCA ATMs," as quoted by Kontan.co.id (October 6).

The use of digital banking has increased significantly. According to Bank Indonesia (BI), digital banking transactions reached IDR 15,881.5 trillion in the first quarter of 2024 - an increase of 16.15% compared to the previous year (Setiawati, 2024). According to research agency Populix, BCA Mobile was the most popular mobile banking service provider in Indonesia as of May 2024. Launched in 2011 by PT Bank Central Asia Tbk, the application was chosen by around 40% of respondents, mainly due to its features and user-friendly interface.

Many users chose BCA Mobile for its security and convenience (Yonatan, 2024). Innovations such as cardless withdrawal simplify transactions for users who may forget their debit cards, thus improving the overall customer experience (Arliyani & Vidyasari, 2022). BCA Mobile's cardless withdrawal system not only provides ease of use, but also enhances transaction security by reducing the risks associated with lost or stolen ATM cards. The method is designed to be user-friendly for people with varying levels of technological sophistication (Mabruri Pudyas Salim, 2024).

Therefore, cardless withdrawal is seen as an effective solution to meet the convenience expectations of mobile banking users. However, customers also remain concerned about the security aspects (Singh & Srivastava, 2018). Despite continuous improvements, some customers are still reluctant to use mobile banking due to perceived security risks (Pambudi et al., 2023). Security and risk considerations are key factors influencing the adoption of cardless capabilities. Incidents of data breaches and privacy violations have contributed to public skepticism about mobile banking services. Thus, security on digital platforms plays a significant role in shaping users' decisions to adopt or switch platforms (Putri & Yayuk Sri Rahayu, 2024).

Fraudulent activities such as unauthorized transfers, data theft, hacking, and card loss remain pressing concerns. These risks often arise in moments of urgency, when users may forget their debit cards, resulting in interrupted transactions and potential exposure to hackers (Arliyani & Vidyasari, 2022). Debit and credit card data theft is typically accomplished by illegally copying information from the magnetic stripe of the card. Skimming devices are typically installed in ATM card slots (Merdeka.com, 2022). Some users also prefer to carry slim cardholders instead of bulky wallets, which are prone to accidental loss. In addition, the growing popularity of cardless transactions is driven by the desire to avoid card swallowing incidents at ATMs.

Focusing on BCA Mobile users in the Greater Surabaya area (Surabaya, Sidoarjo, and Gresik) - a region with a large population and rapid economic growth - can provide valuable insights into the factors influencing interest in cardless withdrawal services, which may differ from other regions. Previous studies may have overlooked the specific factors influencing mobile banking adoption in Surabaya Raya. By examining the relationships between knowledge, security, and transaction convenience, banks can better attract new customers and retain existing ones by tailoring services to users' needs. Although this innovation is relatively new, it remains unclear whether the mobile banking features provided effectively meet user expectations. Therefore, the actual usage of mobile banking features should be evaluated (Sari, 2021). The results of this study could help Bank BCA to develop new BCA Mobile features that meet the needs and preferences of users in Greater Surabaya, thereby improving the user experience.

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Previous research on cardless withdrawal has shown mixed results regarding the influence of knowledge, security, and convenience on user interest. Fajriastuti & Arman (2022) found that knowledge significantly influenced customer interest in using cardless withdrawal. However, Siregar (2021) found that knowledge did not impact interest in using QRIS, suggesting that increased knowledge does not always lead to increased interest in use. Patel & Patel (2018) argued that perceived security has a positive effect on customer interest in internet banking. Conversely, Nambiar & Bolar (2023) found no significant effect of perceived security on behavioral interest in using cardless services. According to Mukhtisar et al. (2021), perceived ease of use significantly influences interest in adoption. In contrast, Laloan et al. (2023) concluded that ease of use had no effect on interest in using the OVO application.

Previous studies may have emphasized technological or digital adoption aspects without examining how user knowledge directly or indirectly influences decisions to use cardless withdrawal services. This highlights a research gap in exploring the role of user knowledge in shaping interest in cardless withdrawal. Specifically, there is a lack of studies that examine the mediating effects of knowledge, security, and transaction convenience in the context of BCA Mobile users in Surabaya Raya. This study seeks to contribute to technology adoption theory, particularly in mobile banking, by identifying the roles of knowledge, security, and transaction ease - thereby enriching the existing literature.

2. Literature Review

Theory of Planned Behavior (TPB)

The Theory of Planned Behavior (TPB) is a psychological framework used to evaluate human response patterns. It can be systematically planned by considering the nature of human behavior (Beck & Ajzen, 1991). Ajzen (1991) proposed that TPB offers advantages over other behavioral theories, as it allows individuals to recognize belief structures that influence control over actions resulting from specific behaviors. The theory comprises three core components that affect behavioral intentions: attitude toward behavior, subjective norms, and perceived behavioral control (Yuliana et al., 2022).

Control beliefs refer to an individual's confidence in their ability to perform a behavior, which is shaped by previous experiences or information that may either facilitate or hinder the action. Perceived power, on the other hand, refers to the degree of influence exerted by facilitating or inhibiting factors in executing the behavior (Ilmi et al., 2020). TPB posits that individuals act rationally by considering the possible outcomes of their actions. The framework aims to understand how individuals perceive their actions, encompassing attitudes toward behavior, normative beliefs, and motivational aspects derived from perceived social approval (Yennisa & Putri, 2023).

Behavioral Intention

According to Jogiyanto, as cited in Mukhtisar et al. (2021), intention is defined as a person's willingness or desire to engage in a certain behavior. When individuals have a specific intention or desire, they are more likely to perform the related behavior, often considering the consequences of their actions (Siregar, 2021). Ajzen's (1991) TPB adds Perceived Behavioral Control to the original model, complementing Attitude Toward Behavior and Subjective Norms.

Abrilia & Tri (2020) propose four dimensions of behavioral intention in the context of using digital applications or services:

a) Intention to use
b) Willingness to use in the future
c) Interest in the object of use
d) Tendency to consistently use the service

Knowledge

In the TPB framework, particularly in the Perceived Behavioral Control construct, knowledge is considered a factor that indirectly influences an individual's attitudes and behaviors. Perceived

control reflects the extent to which a person feels capable of using mobile banking services. Knowledge can reinforce one's beliefs, thereby shaping attitudes, subjective norms, and perceived control, ultimately influencing intention and behavior.

Juwaheer, as cited in Ali et al. (2021), defines knowledge as the level of information and understanding that consumers have about a product or service. A lack of knowledge is a common barrier to the adoption of mobile banking services. Many users are still unaware of the features and benefits offered by mobile banking applications (Pambudi et al., 2023). In essence, knowledge encompasses human curiosity and the pursuit of understanding the environment. Financial literacy is crucial, as it enables individuals to make informed decisions about spending and managing personal finances (Yerianto & Mustaqim, 2024).

According to Larasati & Hakim (2022), the indicators of consumer knowledge are:
a) Awareness (Know)
b) Understanding (Understand)
c) Application (Apply)

Security

From the perspective of TPB, **security** in mobile banking refers to the user's perception of safety and risk related to digital financial services. This perception significantly influences attitude, subjective norms, and perceived behavioral control when deciding whether to use the service. Security enhances user trust and comfort in using mobile banking applications (Farizqi et al., 2022).

Mahardika, as cited in Mukhtisar et al. (2021), defines security as the system's capability to protect mobile banking data and prevent unauthorized access or misuse of customer accounts. When users believe that the system is secure, their trust in the technology increases (Kartika, 2018). Security encompasses protection of personal and financial information against fraud, data breaches, and cyberattacks.

According to Fajriastuti & Arman (2022), higher levels of perceived security lead to greater intention to use mobile banking services, as customers feel safe during transactions. Therefore, BCA, as a mobile banking service provider, must ensure advanced technological safeguards to protect sensitive data from unauthorized parties. Consequently, concerns related to lost cards or forgotten PINs can be minimized (Phothikitti, 2020). Cardless withdrawals are designed to ensure that only the account holder can perform transactions (Nambiar & Bolar, 2023). Security in mobile banking is crucial, as it directly impacts service quality and customer satisfaction (Mustika & Siregar, 2024).

Singh & Srivastava (2018) identify the following security indicators:
a) Mobile Payment Security
b) Device Security
c) Network Security

Ease of Transaction (Ease of Use)

According to Jogiyanto, **ease of transaction** refers to the extent to which users perceive that using the cardless withdrawal feature on mobile banking is simple and convenient. In the TPB model (Ajzen, 1991), ease of use significantly affects behavioral intention. When mobile banking services are easy to understand and operate, users are more likely to adopt features like cardless withdrawals.

The simplicity of a system contributes to user acceptance, as individuals are more inclined to adopt technologies that are easy to navigate (Hidayah et al., 2022). Isnawati (2020) defines transaction ease as a financial transaction method that is practical, varied, and easily controlled, making it advantageous and appealing to users.

Convenience is essential in encouraging customers to transition from traditional to digital banking services. The indicators of transaction ease, according to Isnawati (2020), are:
a) Easy to learn
b) Easy to operate
c) Clear and understandable
d) Controllable

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3. Research Methods

This study employs a quantitative approach by utilizing both primary and secondary data sources. Primary data were collected through an online questionnaire distributed via Google Forms, while secondary data were obtained from previous studies related to mobile and cardless withdrawal services. The target population comprises BCA Mobile users residing in the Greater Surabaya area, which encompasses Surabaya, Sidoarjo, and Gresik.

A purposive sampling technique was employed, with the selection of participants guided by explicit criteria. The first objective of this study is to determine whether respondents possess a BCA account or BCA Mobile. The second objective is to ascertain whether respondents have utilized the Cardless Withdrawal feature. The sample size was determined using Hair et al.'s (2019) formula for unknown population sizes, with 641 targeted respondents and 485 valid responses collected.

The collected data were then subjected to analysis using Partial Least Squares Structural Equation Modeling (PLS-SEM) through SmartPLS version 4.0. The analysis process entailed the evaluation of the measurement model (in terms of validity and reliability) and the structural model to ascertain both direct and indirect effects. A five-point Likert scale was utilized to assess attitudes, perceptions, and behavioral intentions, ranging from 1 (Strongly Disagree) to 5 (Strongly Agree) (Sugiyono, 2022).

Based on the theoretical framework and empirical context, this study hypothesizes that knowledge, security, and ease of transaction have significant influences on the intention to use cardless withdrawal services. Additionally, it is proposed that knowledge and security indirectly affect user intention through the mediating role of transaction ease.

4. Results and Discussion
Outer Model
1. Convergent Validity dan Reliability

The validity test is a crucial component of research instrument evaluation, as it assesses the instrument's suitability for research purposes. The accuracy of the research measurement tool is commensurate with the validity of the instrument. Reliability testing is a methodical procedure that aims to assess the consistency and reliability of the research instrument. According to Hair et al. (2019), the external load value must exceed 0.7 and the average value must exceed 0.5 in order to be considered valid and reliable, provided that the Cronbach alpha value exceeds 0.6.
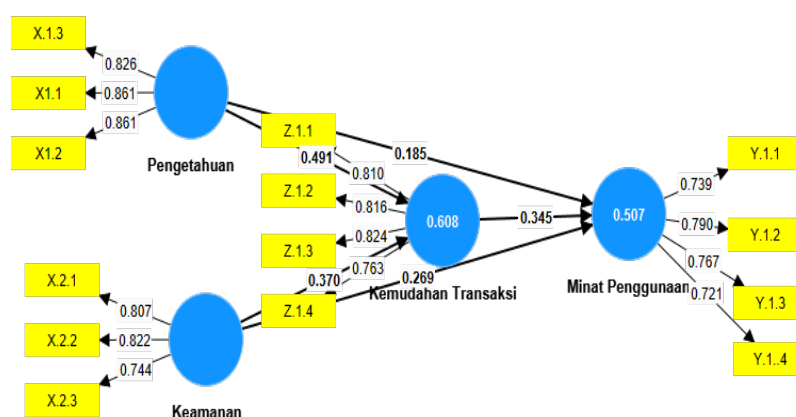

Figure 1. Outer Model (Algorithm)

Tabel 1. Item Meansurement, Outer Loadings, Reliability and Validity

Item Meansurement	Outer Loadings	Cronbach Alpa	reliability (rho_a)	Composite reliability	AVE
Knowledge (P)					
I know how to use the cardless withdrawal service via BCA Mobile	0.861	0.807	0.807	0.886	0.722
I understand what the cardless withdrawal service offered by BCA through BCA Mobile is	0.861				
I am aware of the benefits and data security of using the cardless withdrawal service compared to the usual method	0.826				
Security (K)					
I feel confident and safe when using the cardless withdrawal service via BCA Mobile	0.807	0.702	0.709	0.834	0.627
I believe that Bank BCA has implemented a security system for cardless withdrawals on BCA Mobile	0.822				
I am not worried about the misuse of personal data when using the cardless withdrawal service on BCA Mobile	0.744				
Transaction Facilities (KT)					
The process of using the cardless withdrawal service via BCA Mobile is very easy to learn	0.810	0.817	0.817	0.879	0.646
I can quickly complete a cardless withdrawal without obstacles because the application is easy to operate	0.816				
The BCA Mobile app for the cardless withdrawal service is very clear and user-friendly	0.824				
I do not need help from others to use the cardless withdrawal because the app is easy to control	0.763				
Usage Interest (MP)					
I am interested and intend to use the cardless withdrawal service available on BCA Mobile	0.739	0.748	0.750	0.841	0.569
I plan to use the cardless withdrawal service in the near future	0.790				
Because the cardless withdrawal feature is attractive,	0.767				

I will recommend it to friends or family	
I prefer to use the cardless withdrawal service over the usual withdrawal method	0.721

(Source: Data processed 2025)

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2. Discriminant Validity

Discriminant validity is a concept in psychology that evaluates how different a construct is from other constructs, as well as the number of indicators that define it. The Fornell-Larcker criterion is employed to assess the validity of the model, with acceptable threshold values. In addition to analyzing cross-loading values, another method for determining discriminant validity involves examining the data. Specifically, the average variance generated (AVE) is considered satisfactory if each variable indicator has a value greater than 0.5 (Hair et al., 2019).

Tabel 2. Discriminant Validity

	Security	Transaction Ease	User Interest	Knowledge
Security				
Transaction Ease	0.895			
User Interest	0.850	0.844		
Knowledge	0.831	0.892	0.775	

(Sumber: Data diolah dengan Smart PLS 4.0, 2025)

As demonstrated in Table 2, discriminant validity was evaluated through the implementation of the Fornell-Larcker criterion, a methodological approach that facilitates enhanced interpretability of the results. The findings indicate that the ease of transaction variable exhibits strong discriminant validity, as evidenced by the fact that the root mean square value of AVE is 0.895 higher than the correlation value between the variables. Similarly, the usage intention variable exhibits adequate discriminant validity, with an AVE value of 0.850, which surpasses the correlation between the variables. Furthermore, the knowledge variable exhibits strong discriminant validity, as evidenced by an AVE value of 0.831, which exceeds the correlation value between the variables.

Inner Model

1. Variance Inflation Factor (VIF)

In this study, multicollinearity is defined as the phenomenon in which two or more variables exhibit a high degree of correlation with exogenous variables. This correlation can potentially compromise the model's predictive capability. The presence of multicollinearity is indicated by a

VIF value greater than 5 (Hair et al., 2019). However, the data is considered to be free of multicollinearity if the VIF value is less than 5. The subsequent section details the results of the aforementioned analysis, which have been meticulously evaluated by the researcher.

Tabel 2. Discriminant Validity

	Security	Transaction Ease	User Interest	Knowledge
Security		1.670	2.020	
Transaction Ease			2.552	
User Interest				
Knowledge		1.670	2.284	

(Sumber: Data diolah dengan Smart PLS 4.0, 2025)

As demonstrated in Table 3, the study's VIF values are all less than 5, indicating that the research model does not suffer from multicollinearity. This finding serves to reinforce the outcomes observed in the indicators estimated via PLS SEM, which are characterized by their unbiased nature and can be regarded as robust.

2. R-Square

The coefficient of determination, or R-square, is used to understand the extent to which independent variables affect the dependent variable. The higher the R-square value, the better the predictive ability of the research model. This study employed the R-square metric to examine how the independent variables influence the dependent variable. An R-square value of 0.75 indicates a strong effect, around 0.50 indicates a moderate effect, and around 0.25 indicates a weak effect (Hair et al., 2019). The R-square results were obtained through data processing using SmartPLS 4.0.

Tabel 4. R-Square

	R-square	R-square adjusted	Ket
Transaction Ease	0.608	0.606	Moderat
User Interest	0.507	0.504	Moderat

(Sumber: Data diolah dengan Smart PLS 4.0, 2025)

The results of data processing show that the variable **intention to use** has an R^2 value of 0.507. This R^2 value indicates that 50.7% of the variance in intention to use can be explained by knowledge, security, and transaction convenience. The remaining 49.3% is influenced by other variables not included in this study. An R^2 value of 0.507 represents a moderate level of explanatory power.

3. F-Square

The effect size (F^2) measures the impact of an exogenous variable on an endogenous variable. This effect is quantified using the F^2 metric. The level of substantive impact is determined by the independent variable. An F^2 value of 0.02 indicates a weak effect, 0.15 indicates a medium effect, and 0.35 indicates a strong effect (Hair et al., 2019). Based on data processing using SmartPLS 4.0, the following F^2 values were obtained.

Tabel 5. F-Square

	Keamanan	Kemudahan Transaksi	Minat Penggunaan	Pengetahuan	Ket
Security	0.210	0.073			Lemah
Transactio n Ease		0.095			Lemah
User Interest					Lemah
Knowledg e	0.368	0.030			Lemah

(Sumber: Data diolah dengan Smart PLS 4.0, 2025)

As indicated by the F-square values in Table 5, the variable "Security of Interest in Use" demonstrates an F-square value of 0.073, while the "Ease of Transaction" variable on "Interest in Use" exhibits an F-square value of 0.095. This observation suggests the presence of a weak substantive level. The knowledge variable on interest in use exhibited a weak substantive level, as indicated by an F-square value of 0.030.

Hypothesis Testing

Path coefficients and special inverse effects were used to test the hypotheses. A bootstrapping procedure is used to do this. The strength of the direct relationship between two variables is determined by the path coefficient, also known as the line coefficient. The inverse specific effect determines how much influence the moderating variable has.
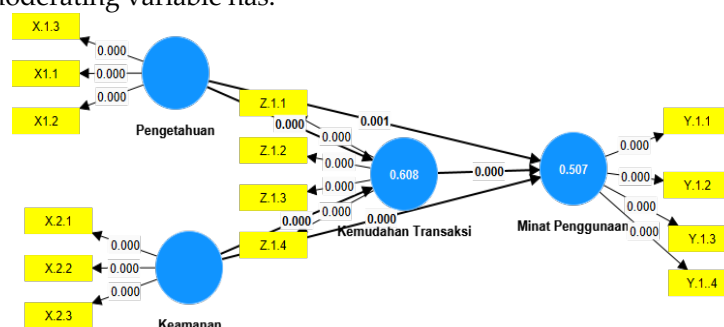

Figure 2. Path Coefficient

1. Path Coefficient

According to Hair et al. (2019), the path coefficient is a measure of the expected relationship between structures. The standard coefficient ranges from -1 to +1, with values above -1 denoting a strongly negative relationship. This assertion is highly critical. The relationship is hypothesized to be weaker or nonexistent, with the coefficient approaching zero. The intensity of the effect, or direct effect (DE), of the independent variable on the dependent variable is calculated using the bootstrap method. The research hypothesis is considered to have been validated if the T statistic value is 1.96 (at the 5% two-tailed significance level) or if the p value is less than 0.05.

Tabel 6. Path Coefficient

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values	Ket
P -> MP	0.185	0.185	0.058	3.185	0.001	Positive Significant
K -> MP	0.269	0.270	0.047	5.678	0.000	Positive Significant

KT -> MP	0.345	0.344	0.058	5.907	0.000	Positive Significant
P -> KT	0.491	0.490	0.040	12.359	0.000	Positive Significant
K -> KT	0.345	0.344	0.058	5.907	0.000	Positive Significant

(Sumber: Data diolah dengan Smart PLS 4.0, 2025)

a) The present study will examine the effect of knowledge variables on interest in use. The path coefficient between the knowledge variable and interest in use is 0.185, with a T statistical value of 3.185 greater than 1.96 at a significant level of $\alpha = 0.05$ and a p-value of 0.001 <0.05. It is hereby indicated that the initial research hypothesis has been endorsed.

b) The impact of security factors on usage interest demonstrates that security exerts a positive and significant influence on usage interest, as evidenced by a path coefficient of 0.269 and a t-statistical value of 5.678, which exceeds 1.96 at a significant level of $\alpha = 0.05$ and a p-value of 0.000 <0.05. Hypothesis 2 is hereby accepted.

c) The Effect of the Ease of Transaction Variable on Interest in Use: The path coefficient between the variable Ease of Transaction and Interest in Use is 0.345, with a t-statistical value of 5.907, which is greater than 1.96 at a significant level of $\alpha = 0.05$ and a p-value of 0.000 < 0.05. This finding indicates that Ease of Transaction exerts a positive and significant influence on Interest in Use. It is hereby posited that Hypothesis 3 has been substantiated.

d) The effect of knowledge variables on the Ease of Transaction is shown that knowledge has a positive and significant impact on the Ease of Transaction, with a path coefficient of 0.491 and a T statistical value of 12.359 greater than 1.96 at a significant level of $\alpha = 0.05$ with a p-value of 0.000 <0.05. Hypothesis 4 is accepted

e) The effect of the Security variable on the Ease of Transaction, the path coefficient between the Security variable and the Ease of Transaction is 0.345 with a T statistical value of 5.907 greater than 1.96 at a significant level of $\alpha = 0.05$ with a p-value of 0.000 <0.05 Hypothesis accepted.

2. Specific Indirect Effect

The specific indirect of the independent variable on the dependent variable is determined by the term 'specific effect' and the moderating variable is used to display the independent variable. Ease of transaction as a moderating variable is assessed by testing this specific indirect effect. For a p-value <0.05 or t-statistics> 1.96 (5% significance level), this research hypothesis can be accepted (Hair et al., 2019).

Tabel 7. Specific Indirect Effect

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values	Ket
K -> KT -> MP	0.128	0.128	0.025	5.159	0.000	Positif Signifikan
P -> KT -> MP	0.169	0.169	0.033	5.056	0.000	Positif Signifikan

(Sumber: Data diolah dengan Smart PLS 4.0, 2025)

A thorough examination of the hypothetical data testing in Table 7 reveals that the variables in this study have p-values less than 0.05. This finding suggests that the variables may have a statistically significant relationship with the dependent variables. The variable ease of transaction, with an initial percentage of 12.8%, has a T-statistic of 5.159 and a p-value of 0.000. These findings indicate a significant positive interest in using cardless withdrawal. The knowledge variable, defined by a simple transaction of 16.9% percentage, yielded a T-statistic of 5.056 and a p-value of 0.000.

3. Upsilon Test

The present study examined the mediation effect in order to ascertain the mediation effect of organizational capacity to change (Pujianto et al., 2024). In this study, the Upsilon formula V = β2MXβ2 YM.X was utilized, with the following criteria for the mediation effect: high mediation effect (0.175), medium mediation effect (0.075), and low mediation effect (0.01), in accordance with Ogbeibu et al. (2021).

Tabel 8. Uji Upsilon

Hipotesis	Mediasi	Keterangan
Security -> Ease of Transaction -> Interest in Use	$(0.491)^2 \times (0.345)^2$ $= 0{,}287$	Tinggi
Knowledge -> Ease of Transaction -> Interest in Use	$(0{,}370)^2 \times (0.345)^2$ $= 0{,}163$	Rendah

(Sumber: Data diolah dengan Smart PLS 4.0, 2025)

The Effect of Knowledge Variable on Interest in Use

The results of the hypothesis test indicate that the knowledge variable exerts a positive and significant effect on interest in use. In accordance with the Theory of Planned Behavior (TPB), the possession of knowledge has been demonstrated to engender a positive attitude, which, within the context of couples, has been shown to result in behavior that is more inclined to utilize the service. This finding suggests that users' awareness of cardless withdrawal options influences their inclination to utilize the service on BCA mobile. It has been demonstrated that the degree of knowledge users possess influences their propensity to engage with the cardless withdrawal feature on BCA mobile. The possession of adequate knowledge has been demonstrated to engender a state of increased comfort and confidence in users when engaging in the practice of cardless cash withdrawals. A comprehensive understanding of cardless withdrawal services fosters enhanced awareness among users regarding the associated benefits, features, and effective utilization methods. The findings of this study are consistent with those reported by Fajriastuti & Arman (2022), which indicated that knowledge exerts a substantial influence on customers' inclination to engage in cardless withdrawals.

The Influence of Security on Usage Intention

The results of the hypothesis testing indicate that the security variable has a positive and significant influence on usage intention. According to Ajzen's (1991) Theory of Planned Behavior (TPB), perceived security contributes to the formation of perceived behavioral control, which reflects the belief that users have control over their actions when using cardless withdrawal services in the Greater Surabaya area. This finding indicates that security is a pivotal factor in influencing users' propensity to utilize cardless withdrawal services. The significance of security in mobile banking applications may motivate BCA to refine its data protection and security policies, thereby cultivating enhanced customer trust and loyalty. It has been demonstrated that users are more inclined to adopt cardless withdrawal services if they perceive them to be secure.

In the context of technological services, user confidence in the security of their personal data and transactions is a critical factor in determining their propensity to utilize the services offered. In this regard, it can be posited that users in the Surabaya area, if they perceive an adequate level of protection for their personal information, are more likely to express a strong inclination to employ these specific services. The presence of a sense of security during transactions has been shown to foster user trust, which in turn has been demonstrated to drive higher usage intention. Conversely, concerns over security may act as a deterrent, discouraging users from engaging with the service. These findings are consistent with those reported by Patel & Patel (2018), who found that perceived security significantly and positively influences users' intention to adopt internet banking services.

The Influence of Transaction Ease on Usage Intention

The hypothesis testing results reveal that transaction ease has a positive and significant effect on usage intention. Based on Ajzen's (1991) Theory of Planned Behavior (TPB), transaction ease relates to perceived behavioral control, enhancing users' confidence in utilizing cardless withdrawal services in the Greater Surabaya area. This indicates that ease of transaction directly increases user interest, as users tend to prefer services that are quick and simple. A system that is user-friendly, fast, and straightforward is more appealing and likely to be adopted in the long term. The absence of additional steps compared to traditional transaction methods further increases user interest. The easier a transaction process is, the higher the likelihood that users will adopt the service. Ease of transaction enhances both the effectiveness and attractiveness of the service. This finding is consistent with Mukhtisar et al. (2021), who reported that ease of use positively influences customers' intention to use mobile banking services.

The Influence of Knowledge through Transaction Ease on Usage Intention

The results of the hypothesis testing indicate that the knowledge variable, mediated by transaction ease, has a positive and significant effect on usage intention. The present study is supported by Ajzen's (1991) Theory of Planned Behavior (TPB). It is suggested that user knowledge enhances the perception of transaction ease. Individuals with a more extensive understanding of these services are more likely to comprehend their functionality and feel more at ease and confident during transactions. This ease of use has been demonstrated to contribute to heightened user interest. The findings suggest that BCA could benefit from designing educational programs aimed at improving users' knowledge regarding security and transaction ease. Such programs could strengthen users' confidence and willingness to adopt cardless withdrawal services. This result aligns with the findings of Komang & Lucy (2022), who concluded that ease of use has a significant and positive impact on users' intention to use QRIS.

The Influence of Security through Transaction Ease on Usage Intention

The hypothesis testing results show that the security variable, mediated by transaction ease, significantly and positively affects usage intention. Within the framework of the Theory of Planned Behavior (TPB), a strong perception of security leads users to feel more at ease and confident in completing transactions. Once a sense of security is established, users are more likely to trust and engage in faster, worry-free cardless withdrawal transactions. Users perceive the transaction process as simple and low-risk, ultimately enhancing their intention to use the cardless withdrawal service. High security contributes to a smoother transaction experience, encouraging continued use of the service. These findings are supported by Khoiriyah et al. (2023), who found that perceived security significantly influences the intention to use e-wallet applications such as DANA in both online and offline retail settings in the Ajung sub-district.

5. Conclusion

The results of this study, analyzed using SmartPLS version 4.0 for both descriptive and statistical evaluation, are grounded in Ajzen's (1991) Theory of Planned Behavior (TPB), which highlights knowledge, security, and transaction ease as key factors driving the adoption of cardless payment services in the Greater Surabaya area. Transaction ease, in particular, contributes to the practicality of cardless withdrawal services, making them more attractive to users. These three components collectively foster customer trust and increase their likelihood of adopting cardless transactions. Unlike previous research that primarily examined direct relationships, this study introduces transaction ease as a mediating variable, revealing its crucial role in linking knowledge and security to users' intention to adopt cardless withdrawal services.

This research provides a novel contribution by applying TPB in the context of digital financial services, offering new insights into user behavior in the fintech landscape. For Bank BCA, the findings underscore the importance of enhancing customer knowledge, ensuring robust and transparent security measures, and optimizing user-friendly transaction processes. By strengthening educational initiatives about the benefits and usage of cardless withdrawals, and by investing in reliable security and seamless service design, BCA can improve customer confidence, encourage adoption, and position itself as a leading institution in secure and user-centered digital banking services.

6. Suggestion

Future studies are recommended to explore additional components that influence user interest in adopting cardless withdrawal services by incorporating variables such as trust, perceived risk, and social influence. This would provide a more comprehensive understanding of the factors affecting the adoption of digital technologies. Subsequent research may also benefit from employing alternative consumer behavior theories for comparative purposes, such as the Technology Acceptance Model (TAM) or the Unified Theory of Acceptance and Use of Technology (UTAUT), alongside the Theory of Planned Behavior (TPB). This comparative approach would offer broader insights into which theoretical framework is more suitable for explaining the adoption of cardless withdrawal services. By extending TPB and integrating it with other theoretical perspectives, future studies can achieve a more in-depth and holistic analysis of technology adoption, particularly in the context of cardless banking services.

From a practical standpoint, Bank BCA is encouraged to implement educational campaigns through social media platforms, the BCA Mobile application, and other digital banking channels to enhance customer understanding of the benefits, features, and usage procedures of cardless withdrawal services. Additionally, BCA could incentivize usage by offering promotions such as cashback, reward points, or loyalty programs for frequent users of the cardless withdrawal service, thereby increasing user interest and continued adoption. To further strengthen user trust, BCA should continue to advance its security technologies by implementing measures such as two-factor authentication, sophisticated data encryption, and enhanced fraud detection systems. By executing these strategies, BCA can significantly improve customer trust, comfort, and satisfaction, while simultaneously promoting the broader adoption of cardless withdrawal services.

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