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Determinants of Attitude and Intention to Use Virtual Credit Cards in Indonesia

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ABSTRACT: Virtual credit cards represent a promising cross-border payment alternative in Indonesia, offering lower costs compared to traditional wire transfers. However, a critical issue remains: ensuring security to protect customers from risks, which is essential for building trust and preventing potential losses. This research aims to examine the effects of key determinants—security, privacy, and reputation of virtual credit card providers—on customer attitudes and intentions. A sample of 126 respondents was surveyed using a 7-point Likert scale questionnaire distributed via social media. Data analysis was conducted using path analysis, revealing that all variables significantly influence trust and perceived risk, with t-statistics below 0.05 and 0.01. The findings indicate that enhanced security, robust privacy protections, and a strong reputation positively affect customer trust while reducing perceived risk. Furthermore, trust and perceived risk significantly impact customer attitudes and intentions towards using virtual credit cards, with positive attitudes leading to a higher likelihood of adoption. This research contributes new evidence supporting the viability of virtual credit cards as a cross-border payment solution in Indonesia. It suggests that banks, as providers of virtual credit card services, should focus on improving security systems, privacy measures, and reputation management to foster customer trust. Limitations of the study include reliance on social media for respondent recruitment and a relatively small sample size. Future research should aim to include a larger and more diverse sample, as well as incorporate insights from banks' internal management to enhance the evaluation of security and privacy measures.

Keywords: customer attitude, customer intention, virtual credit card.

I. INTRODUCTION

1. BACKGROUND

Globalization leads to higher needs for cross-border payment. Cross-border payment is an important thing since cross-border payment provides efficiency in transactions across countries. Countries of G20 make cross-border payment a priority to be formulated as an important financial policy. In this case, Financial Stability Board (FSB) sets the roadmap as the steps to achieve the cross-border payment policy [1].

Also, countries in ASEAN have the initiative of bilateral cooperation to achieve cross-border payment policy, such as creating transaction services by using QR codes and fast payment, where transaction settlement uses the mechanism of local currency settlement (LCS). In the future, the Bank Central of Indonesia has the vision to extend the financial connectivity between ASEAN countries from bilateral scope into a multilateral one to improve economic integration. Financial and economic integration is an important thing to support economic recovery and business integration, especially for small-medium enterprises (SMEs), migrant workforce, tourists, and society [2].

Currently, QR codes and fast payment are not fully implemented in Indonesia and not all people can use them. Most Indonesian people still use other alternatives for cross-border payment, such as wired transfers through bank services, e-wallets, and virtual credit cards. However, wired transfer of cross-country transactions is costly, while e-wallet can only cover the transaction where both parties (funder and beneficiary) have the same e-wallet services. This research examines the use of virtual credit cards since credit card payment is a common method provided by the shop as a cross-border payment.

A virtual credit card is a payment alternative using the credit card method; however, the mechanism is not based on loans but based on money debited from customers' savings. Furthermore, there is no obligation for customers to pay debt payments in the future. A virtual credit card can be used if customers have sufficient money as the price that has to be paid. Virtual credit card is an international payment alternative since most international e-commerce shops joined with credit card merchants such as Visa and MasterCard. In Indonesia, the virtual credit card feature is provided by banks of BCA, Mandiri, BNI, and CIMB Niaga through their e-banking services. Virtual credit card is a part of digital payment and financial technology (fintech) development. In Indonesia, Indonesian Credit Card Association reports that 75 percent of credit card holders use credit cards for digital payment [3]. A survey of Katadata Insight Center also finds that the use of credit cards in virtual accounts become the second-best choice after e-wallet payment by customers to do the digital payment.

One of the critical issues in digital payment and fintech is the guarantee of security to protect customers from risks to build customers' trust and avoid potential customer losses [4]. Salo and Karjaluoto [5] find that customers' protection and trust explain all factors of transaction security, privacy problem, application security, and customers' attitude that relate to privacy protection in digital payment [6]. Customers' trust also can give an impact on customers' attitudes toward the use of payment features [7]. On one hand, Gefen et al. [8] find no evidence of a consistent relationship between perceived risk on customers' intention to use digital payment. On the other hand, Ha et al. [9] find that perceived risk has a negative effect on the intention to use digital features in e-commerce where higher perceived risk leads customers to engage less in e-commerce digital.

The existence of virtual credit cards in Indonesia leads to trust and perceived risk become important to be examined to determine the customers' attitudes and intentions to use virtual credit cards. Based on planned behavior theory that suggests customers' attitudes and intentions can be explained by consequences of specific actions [10], security, privacy, and reputation can determine customers' behavior on the use of virtual credit cards. This research aims to examine the effect of determinant factors of customers' behavior (security, privacy, and reputation of virtual credit card providers) on determining customers' attitudes and intentions. Specifically, this research aims to examine the effect of security, privacy, and reputation on trust and perceived risk; the effect of trust and perceived risk on attitude and attention; and the effect of attitude on attention.

There are some studies that relate to virtual credit card. Steven and Pempho [11] find that virtual credit card is important to support economic growth in Malawi. Rusmayanthy et al. [12] find that virtual credit payment in government institution is not optimal in Indonesia. However, there is no previous study that examine attitude and intention to use virtual credit card by using factors of security, privacy, reputation, trust, and perceived risk. This research investigates whether trust and perceived risk, that are built by security, privacy and reputation, affect attitude and intention to use virtual credit card.

This research contributes to providing new evidence of the use of virtual credit cards as a cross-border payment alternative in Indonesia. An initiative of cross-border payment in Indonesia only covers the region of ASEAN. On the other hand, there are already cross-border payment alternatives, namely virtual credit cards provided by banks, and even include international payments in many international e-commerce. Although the use of e-wallet covers wider Indonesian customers, different e-wallet between customers and e-commerce makes customers need to adjust their payment and e-wallet. On the other hand, virtual credit card in Indonesia covers big international merchant such as MasterCard.

2. PROBLEM STATEMENT

There are some arguments that lead to research problem. First, cross-border payment is an important thing since cross-border payment provides efficiency in transactions across countries. Second, virtual credit card is alternative way to perform the cross-border payment. Third, In Indonesia, Indonesian Credit Card Association reports that 75 percent of credit card holders use credit cards for digital payment [3]. Fourth, one of the critical issues in digital payment and fintech is the guarantee of security to protect customers from risks to build customers' trust and avoid potential customer losses [4]. Based on critical arguments, the research problems are as follows:

1. The impact of security on customers' trust in using virtual credit cards.
2. The influence of security on customers' perceived risk when using virtual credit cards.
3. The effect of privacy on customers' trust in using virtual credit cards.
4. The impact of privacy on customers' perceived risk associated with virtual credit cards.
5. The relationship between reputation and customers' trust in using virtual credit cards.
6. The influence of reputation on customers' perceived risk when using virtual credit cards.
7. The effect of customers' trust on their attitude towards the use of virtual credit cards.
8. The influence of customers' trust on their intention to use virtual credit cards.
9. The impact of perceived risk on customers' attitude towards the use of virtual credit cards.
10. The influence of perceived risk on customers' intention to use virtual credit cards.
11. The relationship between attitude and customers' intention to use virtual credit cards.

To address these critical issues, the following research questions have been formulated:

1. How does security affect customers' trust in using virtual credit cards?
2. How does security influence customers' perceived risk when using virtual credit cards?
3. In what ways does privacy impact customers' trust in using virtual credit cards?
4. How does privacy affect customers' perceived risk associated with virtual credit cards?
5. What is the effect of reputation on customers' trust in using virtual credit cards?
6. How does reputation influence customers' perceived risk when using virtual credit cards?
7. How does customers' trust affect their attitude towards the use of virtual credit cards?
8. In what ways does customers' trust influence their intention to use virtual credit cards?
9. How does perceived risk affect customers' attitude towards the use of virtual credit cards?
10. In what ways does perceive risk influence customers' intention to use virtual credit cards?
11. How does attitude affect customers' intention to use virtual credit cards?

The research problems outline the key areas of investigation, focusing on the relationships between security, privacy, reputation, trust, perceived risk, attitude, and intention in the context of virtual credit card usage. The corresponding research questions are designed to guide the inquiry into these relationships, facilitating a structured exploration that can yield valuable insights for both academic research and practical applications in the financial technology sector. And then, these research questions are formulated to explore the intricate relationships between security, privacy, reputation, trust, perceived risk, attitude, and intention in the context of virtual credit card usage. By framing them as questions, the research aims to investigate how each factor influences the others, providing a comprehensive understanding of customer behavior in this domain.

II. LITERATURE REVIEW

1. PLANNED BEHAVIOR THEORY

Planned behavior theory explains the individuals' belief of certain consequences affect their behavior [10]. Planned behavior theory has 3 elements of attitude, behavioral control, dan belief. Element of belief captures the belief system had by individuals as a motivation to do specific actions. The element of behavioral control explains how difficult individuals can handle obstacles. The element of attitude captures the individuals' evaluation of products or services so individuals are ready to make a decision. Some studies already use the planned behavior theory. Bhatti et al. [13] use planned behavior theory to capture that perceived risk

determines customers' intention to use the products in Pakistan. Rehman et al. [14] also use juga the planned behavior theory to capture customers' comfort and has an important role to determine customers' behavior.

Planned behavior theory basically predicting how individuals behave towards virtual credit card. It is important since there are some risks that relate to the use financial technology [15]. By knowing factors that determine behavior, individuals' specific response can be predicted. However, this research excludes planned behavior theory element of subjective norms. Subjective norms refer to the society approval as the motivation of individuals to perform a certain behavior [10]. Virtual credit card in Indonesia is still new and not all banking companies have the feature of virtual credit card. In this case, recommendation of using virtual credit card that come from society (such as family or friends) is still a few. Based on the explanation of planned behavior theory, this research builds a framework for the use of virtual credit cards based on planned behavior theory as in figure 1.

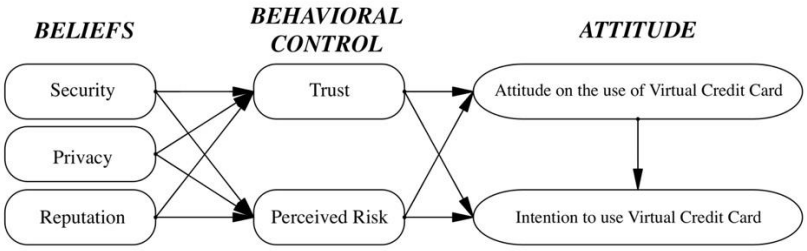

FIGURE 1. The use of virtual credit cards in the context of planned behavior theory.

Based on Figure 1, the element of belief captures the security of the use of virtual credit cards, privacy protection when customers use virtual credit cards and the reputation of banks that provide features of virtual credit cards. The element of behavioral control captures the customers' trust and risk perceived by customers when using virtual credit cards. The element of attitude captures the customers' attitude toward the use of virtual credit cards and customers' intention to use virtual credit cards.

2. CROSS-BORDER PAYMENT AND VIRTUAL CREDIT CARD

International trading has developed rapidly. This condition leads money to stream borderless between countries. The money stream between countries is the rise of cross-border payment systems. The cross-border payment system is a system that facilitates international payment or transactions without considering the region of countries.

On one hand, the acceleration of international trading and financial integration has been done and it still gives progression in the 1990s-2000s [16]. On the other hand, cross-border payment is still costly, ineffective, and inaccessible for most people, especially in emerging and lower-income countries. The international financial system cannot be developed well in emerging and lower-income countries since most people have no bank account with a higher amount of money, are still attached to traditional wired transfers, have lower access to correspondent banks, and have less liquid foreign exchange markets. Based on 112 countries, Bank for International Settlements [17] find that the average cost of an international wired transfer is $200 which captures a 10 percent higher cost than a local wired transfer. In addition, the cost of wired transfer to developed countries is above US$550 billion in 2019. At the same time, 50 percent of adult people in developing countries have no access to bank accounts such as in South Africa, North Africa, and Middle-East countries [17]. As a result, fewer people have banking access to cross-border payment.

In Indonesia, cross-border payment is established to facilitate transactions outside Indonesia. Currently, there is a bilateral agreement between ASEAN countries to use QR codes and fast payment as cross-border payment methods. However, the method is only implemented between Indonesia and Thailand. Generally, the QR code and fast payment still cover ASEAN.

Before cross-border payment in ASEAN happens, Indonesia already implements some methods of cross-border payment. First, cross-border payment can be done by banking wired transfer. Banks in Indonesia

already have features of wired transfer to banks in other countries. It covers the cross-border transaction. However, the wired transfer is costly and customers obligate to pay the additional charges [18].

Second, cross-border payment can be done by e-wallet. Generally, e-wallet uses applications in smart gadgets such as *PayPal*, *Neteller*, *Alipay*, *Apple Pay*, and *Google Pay*. Some e-wallet supports some foreign currency to cover cross-border payment. On the other hand, e-wallet has limitations such as the obligation where the related parties have to have the same e-wallet application [18].

Third, cross-border payment can be done by credit card. The known-well merchants of credit cards that support international transactions are *Visa* and *MasterCard*. Credit card payment is also costly since customers have to pay the debt and its interest in the future [18].

Fourth, cross-border payment can be done by virtual credit card. Virtual credit cards can be implemented if the store accepts credit card payment methods. Compare to the conventional credit card method, a virtual credit card is implemented by taking the money out from the deposit account so customers do not have to have an obligation to pay the debt and its interest in the future. A virtual credit card uses a deposit account to pay the transaction in the form of a credit card by providing the card name, number, expired date, and CVV number to complete the credit card transaction [18]. In Indonesia, a virtual credit card is provided by banks of BNI, BCA, Mandiri, and CIMB Niaga by using mobile banking.

3. HYPOTHESES DEVELOPMENT

Explanation of the Hypotheses

The proposed hypotheses are essential for understanding the dynamics between security, privacy, reputation, trust, perceived risk, attitude, and intention in the context of virtual credit card usage.

Security, privacy, and reputation are critical factors that can significantly influence customers' trust and perceived risk. By examining these relationships, we can identify how they contribute to customers' overall confidence in using virtual credit cards.

Trust and perceived risk serve as mediating variables that affect customers' attitudes and intentions. Understanding how trust can enhance positive attitudes and intentions, while perceived risk can create barriers, is crucial for developing effective strategies to promote virtual credit card usage.

Finally, **attitude and intention** are the ultimate outcomes that reflect customers' willingness to adopt virtual credit cards. By investigating these relationships, we can gain insights into how to encourage more customers to embrace this technology.

3.1. Security, Trust, and Perceived Risk

Virtual credit card payment is used by the application of e-banking or mobile banking. The application is provided by the bank. In this case, the security of the application is important to avoid data theft by credit card merchants or e-commerce stores. Based on previous studies [19], security is identified as a significant risk in digital payment. Li and Liu [20] also find that payment method provider considers security as the main risk where there is potential for data theft and abuse.

Higher security is expected to prevent merchants or e-commerce stores to steal customers data that are used in the application of e-banking or mobile banking. Higher security is also expected to prevent e-commerce store to steal customer data when transaction by virtual credit card is made. The more secure the use of virtual credit cards is, the customers have more trust to use virtual credit cards as payment methods. Secure virtual credit card also leads customers to have a lower risk. Louis and Afgani [21] find that security reduces perceived risk in digital payment and increases customers' trust.

H1a: Security has an effect on customers' trust to use virtual credit card.

H1b: Security has an effect on customers' perceived risk to use virtual credit card.

3.2. Privacy, Trust, and Perceived Risk

Regarding the quality of protection, the ability to protect customers' privacy is also an indicator of security. Privacy refers to the bank's ability to secure the customers' private information when customers use virtual credit cards. Pizzol et al. [22] and Shankar et al. [23] suggest that control and monitoring by banks are important to prevent theft and leakage of customers' private information.

Bank is expected to have the ability to protect customers' private information from opportunist behavior by merchants or e-commerce stores that use credit card payment methods. Higher privacy protection can lead to lower information stealing, especially when customers submit the virtual credit card submission into an *e-banking* or *mobile banking* application, and also when customers do the credit card transaction in the e-commerce payment system. Higher privacy protection can make customers to have trust in the use of virtual credit cards as their payment alternative. Higher privacy protection also reduces perceived risk when customers use virtual credit cards. Chang et al. [24] find that privacy reduces perceived risk in digital payment and leads customers to have higher trust.

H2a: Privacy has an effect on customers' trust to use virtual credit card.

H2b: Privacy has an effect on customers' perceived risk to use virtual credit card.

3.3. Reputation, Trust, and Perceived Risk

Reputation is considered an important factor that can bring customers' trust [25]. The reputation of digital payment providers indicates customers' trust that the digital payment provider can perform professional, honest, and profitable service [26].

Customers tend to choose banks that have higher reputations when customers submit and use virtual credit cards. Banks with higher reputations tend to maintain their reputation by providing higher quality service including the service of virtual credit cards. The quality of virtual credit card service determines customers' trust and leads customers to evaluate the service will bring lower risk. Astono [27] finds a positive relationship between reputation and customers' trust.

H3a: Reputation has an effect on customers' trust to use virtual credit card.

H3b: Reputation has an effect on customers' perceived risk to use virtual credit card.

3.4. Trust, Attitude, and Intention

Trust refers to the condition where one party (customer) agrees to give authority to another party (service or product provider) to do significant action on behalf of the customer regardless of how much control level has over the customer on the service or product provider [28]. Trust comes from honesty in mutual-benefit transactions [29]. Most customers' behavior is determined by their level of trust [30].

In the context of this research, trust refers to customers' belief in banks to fulfill customers needs of virtual credit cards securely and effectively. Customers trust increases customers' positive attitude toward virtual credit cards as a payment method. When customers believe, they tend to have the intention to use virtual credit cards. Jarvenpaa et al. [31] and Chen and Dibb [32] find that customers' trust leads to good relationships and positive attitudes between customers and service or product providers. Zhang et al. [33] also find that trust leads customers to have purchase intention.

H4a: Customers' trust has an effect on attitude towards the use of virtual credit card.

H4b: Customers' trust has an effect on intention to use virtual credit card.

3.5. Perceived Risk, Attitude, and Intention

Perceived risk is an individual belief that relates to benefit and loss [31]. In the context of digital payment, perceived risk is a factor that can interfere with the success of transactions since customers are always proactively aware of the risk in the process of service or product evaluation [34]. Perceived risk happens since customers tend to not examine the real risk and have no opportunity to examine the service when they execute the transaction process. Perceived risk comes from customers' fear and worries about virtual credit card performance that will not fulfill their expectations.

Potentials of leakage of information, data stealing, failure of privacy protection, and reputation loss become some risks that have to be taken by customers in the use of virtual credit cards. Risk and uncertainty lead customers to have bad attitudes and create a negative relationship between risk and attitude [35]. Risk makes customers uncomfortable when they use virtual credit cards. Risk also comes from the gap between customers' expectations and virtual credit card performance such as transaction rapidity, easiness, and comfort [34]. If customers receive virtual credit card performance as they expected, customers will have the intention to use virtual credit cards. Tran and Nguyen [16] find that perceived risk affects customers' attitudes and purchase intentions.

H5a: Perceived risk has an effect on attitude towards the use of virtual credit card.
H5b: Perceived risk has an effect on intention to use virtual credit card.

3.6. Attitude and Intention

Planned behavior theory explains that a positive attitude is a reflection of an individual intention to do specific actions [10]. Customers' attitude captures positive feel and emotion, especially feelings and emotion that relate to the use of virtual credit card. Customers' attitude relates to the expectation that is established based on product or service performance to give profit and benefit to customers. Fulfilled expectation increases customers' intention to use a virtual credit card as their digital payment method. Tran and Nguyen [16] find that a positive attitude by customers makes customers tend to use a product or service.

H6: Attitude has an effect on intention to use virtual credit card.

III. DATA AND METHOD

1. RESPONDENTS

Respondents are determined by the purposive sampling method. The purposive sampling method refers to the sample selection by using certain criteria that relate to the research context. There are 2 criteria in sample selection. First, the sample includes individuals who have bank accounts in the banks of *Mandiri*, *BNI*, *BCA*, and *CIMB Niaga*. In Indonesia, there are only 4 banks that implement virtual credit cards. Second, individuals already install and use applications of *Livin'* (mobile banking of *Mandiri*), *BNI mobile banking* (mobile banking of *BNI*), M-BCA (mobile banking of *BCA*), and *Octo Click* (mobile banking of *CIMB Niaga*). Since virtual credit cards can be used by registering first in mobile banking, this research needs individuals who have mobile banking applications. Third, individuals who already use the features of virtual credit cards at least once.

This research reaches respondents by using all kinds of communication tools and social media such as email, WhatsApp, Facebook, Instagram, Twitter, and LinkedIn. There are some biases by using social media such as invalid answers and invalid respondents. However, this research uses validity and reliability tests to mitigate invalid and not reliable answers. Based on total 71,322 social media users, the questionaries that are sent back include 126 questionaries. Sample size can be determined by G*Power as suggested by Memon et al. [36]. If this research applies effect size of 0.15, error of 0.05, power of 0.8, and 11 predictors [36], sample size should be 123 samples in minimum. However, this research reaches 126 samples. There are 126 respondents as in table 1.

Table 1. Respondents.

Characteristic	Category	Respondent	Percentage of Total
Gender	Male	60	48%
	Female	66	52%
	Total	126	100%
Age	18-25 Years Old	72	57%
	26-33 Years Old	45	36%
	Above 33 Years Old	9	7%
	Total	126	100%
Education	High School Degree	18	14%
	Diploma Degree	9	7%
	Bachelor Degree	63	50%
	Master or Doctoral Degree	36	29%
	Total	126	100%
Affiliation	Student	9	7%
	Private Office Employee	45	36%
	Public Office Employee	37	29%

	Entrepreneur	18	14%
	Others	17	13%
	Total	126	100%
Bank Account (one respondent can have more than one)	*Bank Mandiri*	54	43%
	BNI	45	36%
	BCA	63	50%
	CIMB Niaga	54	43%
	Others	18	14%

2. DATA COLLECTION

In this research, variables include security, privacy, reputation, trust, perceived risk, attitude, and intention. By following Tran and Nguyen [16], this research uses the 7-Likert scale (from strongly disagree to strongly agree) questionaries. The 7-Likert scale can give benefit of more variance of the data. The questionaries are spread to individuals through email, WhatsApp, Facebook, Instagram, and LinkedIn in 2023. This research uses questionaries by Tran and Nguyen [16] that have been adjusted to the context of the use of virtual credit cards. Details of questionaries can be seen in table 2.

Table 2. Research questionaries.

Variables	Indicators	Code
Security	Application of virtual credit card you use has adequate privacy.	SC1
	Purchasing by virtual credit card shall not affect financial losses.	SC2
	Transaction with virtual credit card has been protected by the best tool.	SC3
	Payment with virtual credit card is safe.	SC4
	Application of virtual credit card you are using can handle problems related to hackers.	SC5
Privacy	All of the information you provide in virtual credit card application will be confidential.	PR1
	Information about payment will be protected adequately.	PR2
	Application of virtual credit card you are using methods shall be suitable to obtain your personal information.	PR3
	Bank shall not obtain your personal information unnecessarily.	PR4
	Bank shall take advantage of your personal information provided on purpose.	PR5
Reputation	Banks that provide virtual credit card features are big companies.	RP1
	Banks that provide virtual credit card features are extremely famous.	RP2
	Banks that provide virtual credit card features have considerable reputation.	RP3
Trust	Application of virtual credit card you are using have ability and specialization to conduct the transactions as expected	TR1
	Banks are entitled to access to necessary information to appropriately handle the transactions.	TR2
	Banks shall be completely fair when handling the transactions for customers.	TR3
	Banks always ensure in the service policies for customers when conducting the transactions	TR4
	Banks always open and welcome the needs of customers	TR5
	Banks always make good efforts to handle all of the concerns of customers	TR6
	In general, banks shall be reliable	TR7
Perceived Risk	Entering the private information during the using process shall be not safe.	RI1
	It is extremely risky when customers provide the private information when using virtual credit card	RI2
	I am afraid of entering the information when using virtual credit card	RI3

	I think entering the personal information when using virtual credit card shall be not safe	RI4
	I think when entering some personal information related to legal data shall be not safe	RI5
	I am afraid of providing personal information such as: name, address, telephone number	RI6
Attitude	I like the idea of using virtual credit card as payment method	AT1
	Using virtual credit card to shop shall be a good idea.	AT2
	Using virtual credit card shall be a wise decision.	AT3
Intention	I continue to return to virtual credit card for transaction	IN1
	I consider that I shall make purchases by using virtual credit card in the next three months	IN2
	I consider that I shall make purchases by using virtual credit card in the next year	IN3
	For purchasing transactions, I am using virtual credit card	IN4

3. DATA ANALYSIS

Data analysis uses path analysis by using structural equation modeling. Structural equation modeling is used to examine the effect of independent variable on dependent variable with multiple paths. This research also performs validity, reliability, and goodness fit of tests including R Squared, CMIN/DF, GFI, AGFI, CFI, NFI, SRMR, and RMS theta. Validity and reliability tests ensure that questionaries are valid and reliable. Goodness fit of tests including R Squared, CMIN/DF, GFI, AGFI, CFI, NFI, SRMR, and RMS theta are performed to ensure the model is fit and give unbiased hypothesis examination. Furthermore, the hypotheses test uses coefficient and t-statistics values of path analysis where hypotheses are accepted if coefficient values are positive and t-statistics are significant.

This research also uses one-factor analysis to examine common method variance as an indicator of common method bias [37]. The result shows that percent of variance is below 50% which indicate there is no problem of bias of variance [37].

IV. RESULTS AND DISCUSSION

1. DESCRIPTIVE STATISTICS

Table 3. Descriptive statistics.

Variables	Average	Standard Deviation
Security	5.28	1.07
Privacy	5.30	1.14
Reputation	5.75	1.10
Trust	5.61	0.38
Perceived Risk	3.38	1.11
Attitude	5.75	0.94
Intention	5.53	0.74

Table 3 shows the average value of security is 5.28 with a standard deviation of 1.07. The average value of privacy is 5.30 with a standard deviation of 1.14. The average value of reputation is 5.75 with a standard deviation of 1.10. The average value of trust is 5.61 with a standard deviation of 0.38. The average value of perceived risk is 3.38 with a standard deviation of 1.11. The average value of attitude is 5.75 with a standard deviation of 0.94. The average value of intention is 5.53 with a standard deviation of 0.74.

2. VALIDITY AND RELIABILITY

Table 4. Validity and reliability tests.

Indicators	Factor Loading	AVE	Composite Reliability	Alpha
SC1	0.837	0.762	0.892	0.878
SC2	0.817			
SC3	0.844			
SC4	0.856			
SC5	0.827			
PR1	0.820	0.698	0.944	0.865
PR2	0.845			
PR3	0.871			
PR4	0.859			
PR5	0.798			
RP1	0.828	0.761	0.902	0.863
RP2	0.880			
RP3	0.808			
TR1	0.809	0.787	0.903	0.846
TR2	0.859			
TR3	0.784			
TR4	0.833			
TR5	0.809			
TR6	0.860			
TR7	0.789			
RI1	0.811	0.706	0.888	0.798
RI2	0.867			
RI3	0.789			
RI4	0.831			
RI5	0.840			
RI6	0.829			
AT1	0.864	0.693	0.909	0.818
AT2	0.794			
AT3	0.860			
IN1	0.791	0.733	0.893	0.816
IN2	0.823			
IN3	0.822			
IN4	0.842			

The validity test uses the values of factor loading and AVE, while the reliability test uses the values of composite reliability and alpha. Based on table 4, the value of factor loading for all indicators is above 0.7 which indicates that all indicators in the questionaries are valid. The value of AVE for all indicators is above 0.5 which indicates that all indicators in the questionaries are valid. The value of composite reliability is above 0.7 while the value of alpha is above 0.6 which indicates that all indicators in the questionaries are reliable.

Table 5. Validity test of Fornell and Larcker.

Fornell and Larcker Criterion	Security	Privacy	Reputation	Trust	Perceived Risk	Attitude	Intention
Security	0.873						
Privacy	0.441	0.835					

Reputation	0.602	0.418	0.872				
Trust	0.344	0.371	0.518	0.887			
Perceived Risk	-0.311	-0.231	0.233	-0.498	0.840		
Attitude	0.557	0.485	0.511	0.497	0.398	0.832	
Intention	0.453	0.523	0.345	0.523	0.444	0.521	0.856

This research also uses Fornell and Lacker Criterion as validity test. Based on table 5 the value of Fornell and Lacker Criterion is bigger than other correlation values with other variables. It indicates that questionaries are valid.

Table 6. Validity test of Heterotrait-Monotrait Ratio (HTMT).

HTM	Security	Privacy	Reputation	Trust	Perceived Risk	Attitude	Intention
Security							
Privacy	0.732						
Reputation	0.893	0.709					
Trust	0.635	0.662	0.809				
Perceived Risk	0.602	0.522	0.524	0.789			
Attitude	0.848	0.776	0.802	0.788	0.689		
Intention	0.744	0.814	0.636	0.814	0.735	0.812	

This research also uses Heterotrait-Monotrait Ratio (HTMT) as validity test. Based on table 6 the value of HTMT is lower than 0.9. It indicates that questionaries are valid.

3. PROPOSED MODEL

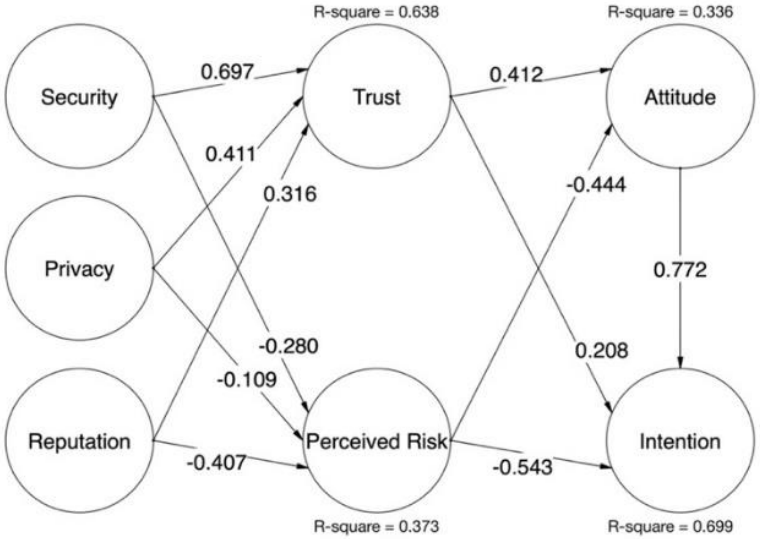

FIGURE 2. Proposed model.

Figure 2 shows the model of the research. The value of R-square for the effect on trust is 0.638 which indicates trust to use a virtual credit card can be explained by 63.8% of security, privacy, and reputation while 36.2% of trust is explained by other variables. The value of R-square for the effect on perceived risk is

0.373 which indicates a perceived risk to use a virtual credit card can be explained by 37.3% of security, privacy, and reputation while 62.7% of perceived risk is explained by other variables. The value of R-square for the effect on attitude is 0.336 which indicates attitude towards the use of virtual credit cards can be explained 33.6% by trust and perceived risk while 66.4% of attitude is explained by other variables. The value of R-square for the effect on intention is 0.699 which indicates an intention to use a virtual credit card can be explained 69.9% by trust, perceived risk, and attitude while 30.1% of intention is explained by other variables. Based on the values of R-square, the highest explanatory power occurs in the effect of trust, perceived risk, and attitude on intention to use virtual credit cards.

4. MODEL FITNESS

Table 7. Model fitness.

Test	Value	Cut-off	Notes [38]
CMIN/DF	1.131	below 103.675	Sufficient sample
GFI	0.961	above 0.9	Model fit with data
AGFI	0.955	above 0.9	Model fit with data
CFI	0.966	above 0.9	Model fit with data
NFI	0.964	above 0.9	Model fit with data
SRMR	0.041	below 0.08	No misspecification model
RMS theta	0.101	below 0.12	No error correlation

Table 7 shows the measurements of model fitness. The value of CMIN/DF is 1.131 (insignificant) which is below 103. 675. It indicates that the model has a sufficient number of samples. The values of GFI, AGFI, CFI, and NFI are above 0.9 which indicates the model fit with the data. The value of SRMR is 0.041 which is below 0.08. It indicates that there is no problem with the misspecification model. The value of RMS theta is 0.101 which is below 0.12. It indicates that there is no correlation between error terms.

5. HYPOTHESIS TESTING

Table 8. Path analysis.

Path	Coefficient	t-Statistic	P values
Security -> Trust	0.697	3.027	0.002*
Security -> Perceived Risk	-0.280	2.472	0.007*
Privacy -> Trust	0.411	2.748	0.003*
Privacy -> Perceived Risk	-0.109	2.218	0.014**
Reputation -> Trust	0.316	2.636	0.005*
Reputation -> Perceived Risk	-0.407	2.934	0.002*
Trust -> Attitude	0.412	2.657	0.004*
Trust -> Intention	0.208	2.359	0.010**
Perceived Risk -> Attitude	-0.444	3.144	0.001*
Perceived Risk -> Intention	-0.543	3.620	0.000*
Attitude -> Intention	0.772	3.712	0.000*

*Significant in 0.01, **Significant in 0.05.

Table 8 shows that the path of security on trust (Security -> Trust) has a coefficient of 0.697 with a t-statistic of 3.027 (significant in 0.01). The result shows that higher security leads to higher trust. It indicates that H1a is accepted where security has an effect on customers' trust to use virtual credit cards. The path of security on perceived risk (Security -> Perceived Risk) has a coefficient of -0.280 with a t-statistic of 2.472 (significant in 0.01). The result shows that higher security leads to lower perceived risk. It indicates that H1b is accepted where security has an effect on customers' perceived risk to use virtual credit cards.

The path of privacy on perceived risk (Privacy -> Perceived Risk) has a coefficient of 0.411 with a t-statistic of 2.748 (significant in 0.01). The result shows that higher privacy leads to higher trust. It indicates that H2a is accepted where privacy has an effect on customers' perceived risk to use virtual credit cards. The path of privacy on perceived risk (Privacy -> Perceived Risk) has a coefficient of -0.109 with a t-statistic of 2.218 (significant in 0.05). The result shows that higher privacy leads to lower perceived risk. It indicates that H1b is accepted where privacy has an effect on customers' perceived risk to use virtual credit cards.

The path of privacy on reputation (Reputation -> Perceived Risk) has a coefficient of 0.316 with a t-statistic of 2.636 (significant in 0.01). The result shows that a higher reputation leads to higher trust. It indicates that H3a is accepted where reputation has an effect on customers' perceived risk to use virtual credit cards. The path of reputation on perceived risk (Reputation -> Perceived Risk) has a coefficient of -0.407 with a t-statistic of 2.934 (significant in 0.01). The result shows that a higher reputation leads to lower perceived risk. It indicates that H3b is accepted where reputation has an effect on customers' perceived risk to use virtual credit cards.

The path of trust on attitude (Trust -> Attitude) has a coefficient of 0.412 with a t-statistic of 2.657 (significant in 0.01). The result shows that higher trust leads to a more positive attitude. It indicates that H4a is accepted where customers' trust has an effect on their attitude toward the use of virtual credit cards. The path of trust on intention (Trust -> Intention) has a coefficient of 0.208 with a t-statistic of 2.359 (significant in 0.05). The result shows that higher trust leads to higher intention. It indicates that H4b is accepted where customers' trust has an effect on intention to use virtual credit cards.

The path of perceived risk on attitude (Perceived Risk -> Attitude) has a coefficient of -0.444 with a t-statistic of 3.144 (significant in 0.01). The result shows that lower perceived risk leads to a more positive attitude. It indicates that H5a is accepted where perceived risk has an effect on attitude towards the use of virtual credit cards. The path of perceived risk on intention (Perceived Risk -> Intention) has a coefficient of -0.543 with a t-statistic of 3.620 (significant in 0.01). The result shows that lower perceived risk leads to higher intention. It indicates that H5b is accepted where perceived risk has an effect on the intention to use a virtual credit card. The path of attitude on intention (Attitude -> Intention) has a coefficient of 0.772 with a t-statistic of 3.712 (significant in 0.01). The result shows that a more positive attitude leads to higher intention. It indicates that H6 is accepted where attitude has an effect on the intention to use a virtual credit card.

6. DISCUSSION

This research aims to examine the effect of security, privacy, and reputation on trust and perceived risk; the effect of trust and perceived risk on attitude and attention; and the effect of attitude on attention in the context of the use of virtual credit cards. This research contributes to providing new evidence of the use of virtual credit cards as a cross-border payment alternative in Indonesia.

Based on path analysis, this research finds that hypotheses of H1-H6 are accepted. First, H1a is accepted where security has an effect on customers' trust to use virtual credit cards. H1b is also accepted where security has an effect on customers' perceived risk to use virtual credit cards. Since a virtual credit card is one of the digital payment methods, customers have to access applications of mobile banking or e-banking through Internet accesses. The issue of security in digital payment is important since the internet is linked to other parties such as merchants, banks, e-commerce stores, and hackers. In the context of security, the main problem in the use of virtual credit cards is private information theft and abuse. When customers feel that their private information is secure, customers will have high trust in the security system. Customers also feel that they will bear low risk, especially the risk of theft and abuse when their private information is secure.

This finding is consistent with Riquelme and Román [39] who find that security reduces perceived risk in digital payment and increases customers' trust.

Second, H2a is accepted where privacy has an effect on customers' trust to use virtual credit cards. H2b is also accepted where privacy has an effect on customers' perceived risk to use virtual credit cards. Privacy relates to the banks' ability to protect customers' privacy including private information. Banks have to ensure that customers' private information is only used by parties that only authorized. In this case, customers feel that their privacy is safe. When customers feel that their private information is safe, customers will have high trust in the banks' ability to secure their data. Customers also feel that they will have a low risk of do digital payments by using virtual credit cards. This finding is consistent with Chang et al. [24] and Xu et al. [40] who find that privacy reduces perceived risk in digital payment and leads customers to have higher trust.

Third, H3a is accepted where reputation has an effect on customers' trust to use virtual credit cards. H3b is also accepted where reputation has an effect on customers' perceived risk to use virtual credit cards. When banks and their products of virtual credit cards have a high reputation, customers will put their trust in them. When a high reputation occurs, customers will see banks as the provider that can perform professional, honest, and beneficial service. Customers also evaluate banks' performance to measure risks such as reputation. In this case, customers tend to choose banks that have high reputations to reduce risks. This finding is consistent with Jarvenpaa et al. [31], Kabadayi et al. [41], and Teo and Liu [42] who find a positive relationship between reputation and customers' trust. This finding is also consistent with Johnson and Grayson [43] who find that customers bear lower risk when service providers have higher reputations.

Fourth, H4a is accepted where customers' trust has an effect on their attitude towards the use of virtual credit cards. H4b is also accepted where customers' trust has an effect on intention to use virtual credit card. Trust occurs when customers give authority to banks as virtual credit card service providers to process their data, information, and money to issue virtual credit cards as digital payment methods for customers. When customers have high trust, they tend to have a positive attitude including that customers believe banks will fulfill customers' needs. High trust also leads customers to have the intention to use banks' services including virtual credit cards as digital payment methods. This finding is consistent with Jarvenpaa et al. [31] and Chen and Dibb [32] who find that customers' trust leads to good relationships and positive attitudes between customers and service or product provider. This finding is also consistent with Zhang et al. [33] who find that trust leads customers to have purchase intention.

Fifth, H5a is accepted where perceived risk has an effect on attitude towards the use of virtual credit cards. H5b is also accepted where perceived risk has an effect on the intention to use a virtual credit card. Perceived risk is generated by customers' perception of benefits and losses. Benefits and losses are based on the gap between customers' expectations and real experience. The perception of risk occurs because customers have no opportunity to assess the real risks. Risk includes the potential losses had by customers. When customers assess and evaluate the services and products, they estimate the risks they have to bear including the potential for leakage of information, data stealing, failure of privacy protection, and reputation loss. High risks lead customers to have negative attitudes and build negative relationships with the banks. In this case, lower risks lead customers to believe that virtual credit card is a reliable payment method. Lower risks also lead customers to have the intention to use virtual credit cards. This finding is consistent with Tran and Nguyen [16] who find that perceived risk affects customers' attitudes and purchase intention.

Sixth, H6 is accepted that attitude has an effect on the intention to use virtual credit cards. Customers' attitude includes positive feel and emotion, especially feelings and emotion that relate to the use of virtual credit card. When customers believe that a virtual credit card has performed as customers expect, they will choose to use the service of a virtual credit card. This finding is consistent with Tran and Nguyen [16] who find that positive attitudes by customers make customers tend to use products or services.

In general, the results confirm the planned behavior theory where beliefs system and behavioral control determine customers' behavior. Specifically, belief systems can be explained by the security, privacy protection, and reputation had by the banks as virtual credit card providers. Behavioral control is explained by trust and perceived risk by customers. Customers' behavior is explained by their positive attitude and intention to use virtual credit cards. This research implies banks as virtual credit card service providers, especially *Bank Mandiri*, *BCA*, *BNI*, and *CIMB Niaga*. By improving security systems, privacy protection, and

reputation establishment; banks can gain customers' trust to use banks' service of virtual credit cards. In detail, banks can build systems in e-banking or mobile banking to secure customers' private information from abuse of data by hackers or other external parties. The results are limited only to *Bank Mandiri*, *BCA*, *BNI*, and *CIMB Niaga* customers.

V. CONCLUSION

This research aims to examine the effect of determinant factors of customers' behavior (security, privacy, and reputation of virtual credit card providers) on determining customers' attitudes and intentions. Specifically, this research aims to examine the effect of security, privacy, and reputation on trust and perceived risk; the effect of trust and perceived risk on attitude and attention; and the effect of attitude on attention. Based on data analysis, security, privacy, and reputation have effects on trust and perceived risk to use virtual credit cards. Trust and perceived risk also have effects on attitude and intention to use virtual credit cards. Furthermore, the attitude has an effect on intention to use virtual credit cards. The result indicates that when a virtual credit card provider has a sufficient security system, privacy protection, and a high reputation; customers will trust and have a low risk to make positive attitudes and intention to use virtual credit cards.

This research implies banks as virtual credit card service providers, especially *Bank Mandiri*, *BCA*, *BNI*, and *CIMB Niaga*. By improving security systems, privacy protection, and reputation establishment; banks can gain customers' trust to use banks' service of virtual credit cards. In detail, banks can build systems in e-banking or mobile banking to secure customers' private information from abuse of data by hackers or other external parties. In this case, banks can gain more customers. This research also implies customers. Customers can use virtual credit cards as an alternative to digital payment, especially for cross-border transactions. By evaluating banks' security systems, privacy protection, and reputation; customers can use virtual credit cards. This research also implies financial regulators in Indonesia formulate regulations or specific systems that can be implemented by all banks to have services of virtual credit cards. In this case, cross-border payment will be applied in Indonesia with low costs. This research is expected can improve the banking strategy of virtual credit card and increase the number of virtual credit card user.

1. LIMITATION AND SUGGESTION

This research has some limitations. First, this research examines security systems and privacy protection only based on customers' perceptions. Security systems and privacy protection can be evaluated accurately if the evaluation is performed by involving banks' internal management. Future research is expected to examine security systems and privacy protection based on the point of view of banks' internal management. Second, this research finds respondents from social media and does not get the respondents from banks' documents. Banks' documents provide accurate data on which customers who already use virtual credit cards frequently. Social media can provide bias and invalid answers and respondents. Future research is expected to access banks' documents to determine the respondents. Third, this research only uses 126 respondents as research samples. Future research is expected to uses more respondents so the result can be generalized more.

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Author Contribution

Budi Hartono (B.H.), Suci Nasehati Sunaningsih (S.N.S), Mumpuni Wahyudiarti Sitoresmi (M.W.S). Conceptualization, B.H. and S.N.S.; methodology, B.H.; software, M.W.S; validation, B.H., S.N.S. and M.W.S.; formal analysis, B.H. and S.N.S.; investigation, B.H. and S.N.S.; resources, B.H., S.N.S. and M.W.S.; data curation, S.N.S. and M.W.S; writing—original draft preparation, B.H.; writing—review and editing, B.H. and S.N.S.; visualization, M.W.S.; supervision, B.H.; project administration, B.H.; funding acquisition, B.H., S.N.S. and M.W.S.

Conflict of Interest

There is no conflict of interest that has to be disclosed.

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