"Factors affecting Gen Z's intention to use QR Pay in Vietnam after Covid-19"

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FACTORS AFFECTING GEN Z'S INTENTION TO USE QR PAY IN VIETNAM AFTER COVID-19

Abstract

The objective of this study was to examine the determinants that impact the inclination of Generation Z individuals to use QR Pay in the context of Vietnam following the COVID-19 pandemic. In order to gather the necessary data, this study conducted a survey among a sample of 415 individuals who were customers of the relevant service or product. The survey was conducted using the Google Forms platform from September 2022 to January 2023, employing a convenience sampling approach. This paper constructed a research model utilizing the technology acceptance model (TAM) and unified theory of acceptance and use of technology (UTAUT) frameworks. Then, it analyzed the data using partial least squares structural equation modeling (PLS-SEM). Principal findings indicate that attitude, COVID-19 impact, personal innovativeness, perceived compatibility, perceived ease of use, perceived usefulness, and social influence are significant determinants of Vietnamese Gen Z's intention to adopt QR Pay. This study provides valuable insights into the factors affecting Gen Z customers' behavior toward technology adoption in Vietnam under the shadow of the COVID-19 pandemic. The findings can benefit business managers and policymakers, as they can better understand the factors that influence customers' technology adoption and develop effective strategies to enhance customers' acceptance of technology.

Keywords	customer behavior, partial least squares, structural equation modeling, TAM, UTAUT
JEL Classification	D12, G21, M31, P46, Z13

INTRODUCTION

Science and technology have changed people's worldviews, especially in service businesses. Science and technology drive money and banking. Modern science and technology based on enhanced information technology have long intrigued and applied financial organizations and banks worldwide. Technology is vital to national economies (Hanif & Lallie, 2021). National governments have created an e-payment master plan to enable standardized, technology-compatible electronic payment systems to boost the economy (Yan et al., 2021). New transaction technologies have enhanced service quality, reduced costs, and met consumers' quality and timing needs. E-payments are replacing cash (Ajibade & Mutula, 2020). Many users rely on their mobile phones for communication and payments (Chaveesuk et al., 2021; Yuan et al., 2023). In the fourth industrial revolution, characterized by the rapid advancement of technology platforms and business models reliant on technology and the internet, non-cash payment methods have emerged as an inexorable trajectory, catalyzing the digital transformation revolution (Lorenzi et al., 2014; Chaveesuk et al., 2021). Mobile and face recognition payments have increased due to the COVID-19 pandemic's restrictions on personal contact. This accelerated digital transaction services (Ahmed & Damodharan, 2022). The global health crisis has raised consumer demand for digital payment methods, developing several new mobile payment solutions (Gorshkov, 2022). Cashless transactions improve speed, efficiency, and security.

QR code-based contactless payment systems are new and useful. After the COVID-19 pandemic, consumers are favoring this payment method. This service targets tech-savvy people, especially younger ones. Retailers can use payment system technology to incentivize customers when detected. Advanced payment systems have grown in popularity, especially among younger Vietnamese people. This pattern indicates financial transaction technology convergence. Vietnam's banks are introducing and promoting various payment methods, including contactless chip card payments, QR code-enabled online and offline point-of-sale payments, digital service payments, NFC-enabled e-commerce transactions, mobile banking apps, and others.

Tien et al. (2022) recommend using security biometric authentication, card information encryption (tokenization), and electronic identity eKYC with accompanying solutions and services for a secure and convenient approach. QR Pay has gained international interest recently. However, the field of QR Pay is still in its infancy, with little research on consumer acceptance and QR payment technology adoption sectors' unique characteristics (Ahmed & Damodharan, 2022). QR Pay has gone from a trend to a necessity, especially among the young. Many financial institutions have developed digital banking applications to proactively meet the needs of their consumers, particularly Gen Z, which is adept at digital technology (Çera et al., 2020).

In the Vietnamese context, there has been a significant rise in the adoption of advanced payment technologies, which aligns with the global digitization trend. Banks have implemented a variety of payment methods to appeal to technologically proficient customers. QR Pay has quickly become prominent among these options due to its advantages over traditional electronic banking methods. In a relatively brief 2-3 years, it has emerged as the favored option for regular transactions among the younger generations. Conducting a comprehensive investigation into the factors contributing to the acceptance and usage of QR Pay in Vietnam is a pertinent and timely research endeavor.

1. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

A QR code is a two-dimensional barcode capable of storing diverse types of information, including but not limited to URLs, event schedules, contact details, email addresses, SMS messages, textual content, and geolocation data. The act of scanning a QR code can redirect users to a webpage, initiate a phone call, or exhibit a textual message. According to Yan et al. (2021) and Dawi (2019), QR codes have a greater capacity for storing information than conventional barcodes. Furthermore, QR codes are easily readable from any orientation without being influenced by surrounding elements or positioning. Originally created in Japan in 1994 to monitor vehicles throughout production, QR codes have since gained global popularity and are now extensively utilized in diverse domains.

An instance of such an application is QR Pay, which facilitates customers in scanning a QR code on their invoice by utilizing their smartphone's camera. This can be done through mobile banking applications or electronic wallets with QR Pay capabilities. QR codes are utilized for the execution of transactions, encompassing essential information within their structure (Meydanoğlu et al., 2018; Yan et al., 2021). The bank facilitates the transfer of funds from the customer's account to the point-of-sale account while simultaneously deducting the invoice amount through the utilization of a mobile banking application. The utilization of smartphones enables the remote scanning of QR codes, facilitating various value-added services such as online payments. The utilization of QR codes in mobile payment systems obviates the necessity for physical currency or payment cards, as it solely necessitates scanning a code and inputting the desired payment amount to successfully execute a transaction. QR Pay provides a range of advantages, encompassing enhanced user experience, diminished risk, heightened safety, financial savings, simplified setup process, and a dependable solution. Recent research has brought attention to the significant role that QR codes play in

diverse domains, including mobile payments, advertising, and user behavior.

Despite comprising only 10% of payment methods, QR code-based payments are gaining popularity among users due to their expediency and convenience. The deployment process is straightforward and can be effectively utilized across diverse customer bases and business sectors. QR code payment via mobile phones has gained significant popularity among the younger generations due to its inherent convenience (Jiang et al., 2021; Le, 2021). To scan, store, and share QR codes, one must possess a smartphone equipped with a camera and an application specifically designed for barcode scanning purposes. The remaining portion pertains to the ease and convenience of shopping and making payments.

QR Pay enables patrons to circumvent congested spaces, resulting in time and monetary savings. Additionally, this payment method enhances operational efficiency and customer satisfaction by facilitating prompt transactions. Furthermore, it facilitates seamless communication among mobile network operators, mobile device providers, and financial institutions. In brief, QR Pay offers a range of advantages such as enhanced user experience, decreased risk, heightened safety measures, reduced costs, simplified setup process, and a dependable solution. Dawi (2019), Le (2021), and Zheng and Ma (2022) elucidated the significant role played by QR codes and their utilization patterns in diverse domains, including mobile payments and advertising.

This study investigates the factors influencing Gen Z customers' intention to use QR Pay in Vietnam during the COVID-19 pandemic, using the technology acceptance model (TAM) (Davis, 1989) and unified theory of acceptance and use of technology (UTAUT) model (Venkatesh et al., 2003) as the main theoretical framework. The study employs the following three factors from the TAM model: (i) perceived usefulness (PU), (ii) perceived ease of use (PEOU) and (iii) attitude. Additionally, the study utilizes the following four factors from the UTAUT model and its extended version: (i) perceived security (PS), (ii) perceived compatibility (PC), (iii) social influence (SI), and (iv) personal innovativeness (PI). The impact of COVID-19 on

customers' intention to use QR Pay is based on the frameworks by Jiang et al. (2021), Musyaffi et al. (2021), and Tu et al. (2022).

The concept of perceived usefulness pertains to an individual's belief in the extent to which utilizing a particular application system will augment their overall job performance. In the context of QR Pay, perceived usefulness pertains to the extent to which customers believe that utilizing QR Pay yields advantages that augment their professional productivity. The decision of customers to utilize QR Pay is positively influenced by their perception of its usefulness, particularly when they perceive the availability of diverse offerings that cater to their needs, as well as the convenience and efficiency of transactions (Hairani et al., 2021; Eren, 2022; Türker et al., 2022; Zhong & Moon, 2022). Therefore, this study anticipates that perceived usefulness (PU) will positively affect Gen Z customers' intent to use QR Pay.

Perceived ease of use refers to an individual's perception of the simplicity of using a particular system. Perceived ease of use refers to the degree to which an individual believes that utilizing a specific system or innovation will entail minimal physical or cognitive exertion. The likelihood of customer adoption of an innovation or system positively correlates with its ease of learning and usability. The service ought to possess a high degree of clarity and comprehensibility, with transactional operations such as login, exit, payment, and transfer being executed swiftly and with minimal complexity. Prior research has established a positive association between the perception of ease of use and the intention to utilize the service (Hairani et al., 2021; Musyaffi et al., 2021; Türker et al., 2022; Zhong & Moon, 2022). The study anticipates that perceived ease of use (PEOU) will have a positive effect on Gen Z customers' intention to use QR Pay.

The influence of perceived security on customers' technology adoption decisions is positive. Given the escalating prevalence of criminal activities across various domains, it has become imperative for customers to prioritize the safeguarding of both their assets and personal well-being. Hence, the level of security awareness or the perceived level of safety significantly impacts customers' intention to utilize QR pay, as indicated by Dawi

(2019), Eren (2022), Tu et al. (2022), and Türker et al. (2022). Consequently, this paper expects perceived security (PS) to positively affect Gen Z customers' intent to use QR Pay.

Compatibility refers to the extent to which an innovation follows prevailing values, previous experiences, and the requirements of customers. In the context of the QR Pay service, compatibility refers to the utilization of the service in a manner that aligns with the prevailing circumstances, individual way of life, requirements, and inclinations of customers. Existing literature has demonstrated that the propensity of customers to utilize QR Pay is positively influenced by factors such as frequent mobility, as well as the convenience and practicality of the service in accommodating their busy lifestyles and work commitments. This is achieved through the provision of utilities that enable transactions to be conducted at any time and location, thereby eliminating the need to physically visit a bank (Türker et al., 2022; Hairani et al., 2021; Jiang et al., 2021; Suebtimrat & Vonguai, 2021; Liébana-Cabanillas et al., 2015). As a result, this paper expects that perceived compatibility (PC) will favor Gen Z consumers' propensity to use QR Pay.

Social influence is related to customers' intention to use QR Pay. The stronger the attitudes of the stakeholders and the closer the relationship with those stakeholders, the more consumers' buying propensity is affected. Customers use QR Pay because they either listen to the recommendations of relatives, friends, and colleagues or because they see people around them using it to match the general trend of the times (Tu et al., 2022; Suebtimrat & Vonguai, 2021; Chang & Tsai, 2019). As a result, this study suggests that social influence (SI) will favor Gen Z customers' inclination to use QR Pay.

Individuals with innovative characteristics are more likely to adopt new technologies such as QR Pay. Personal innovation refers to an individual's ability to test a new technology before using it. In the case of QR Pay, customers can test the service before using it, which can alleviate some of their concerns about uncertainty. Previous research has shown that allowing users to test a new technology can reduce their fear of using it. In general, individuals with a higher innovation mindset tend to be pioneers or early adopters of new technology. Consequently, individuals with higher levels of personal innovation are expected to hold more positive beliefs about new technology (Tu et al., 2022; Jiang et al., 2021; Suebtimrat & Vonguai, 2021; Liébana-Cabanillas et al., 2015). Consequently, this study foresees that personal innovativeness (PI) will positively affect Gen Z customers' intent to use QR Pay.

The COVID-19 epidemic made many people worry about their financial situation (Durante & Laran, 2016). As a result, people are more inclined to save than to spend in emergencies (Jin et al., 2021). Customers increase their savings to hedge risks and can spend in emergencies (Durante & Laran, 2016). Due to the impact of the COVID-19 pandemic, households increased their savings and decreased their spending in the early stages (Cox et al., 2020). This suggests that as the epidemic becomes more complicated, people will tend to keep or deposit money in banks to ensure financial safety for themselves and their families (Tu et al., 2022; Jiang et al., 2021; Musyaffi et al., 2021). Therefore, this study anticipates that COVID-19 will positively affect Gen Z customers' intent to use QR Pay.

Attitude refers to a person's feelings, favorable or unfavorable evaluation, or tendency to act toward an object or information. Observers can understand a person's psychological disposition, likes and dislikes for an object or subject by examining their attitude. A person's attitude can influence their judgment, information processing, and behavior. Previous research has confirmed a reciprocal relationship between customers' attitudes and their intention to use QR Pay. Specifically, studies have shown a positive association between customer attitude and intention to use QR Pay. Customers with a more positive attitude are more likely to intend to use QR Pay (Suebtimrat & Vonguai, 2021; Liébana-Cabanillas et al., 2015; Sang Ryu & Murdock, 2013). That is why this study believes that attitude will positively affect Gen Z customers' intent to use QR Pay.

Türker et al. (2022) used an extended technology acceptance model (TAM) to analyze the factors influencing the acceptance of QR codes (MPS) by 485 customers in Turkey during the COVID-19 pandemic. The study results indicate that customers in Turkey increasingly prefer the mobile pay-
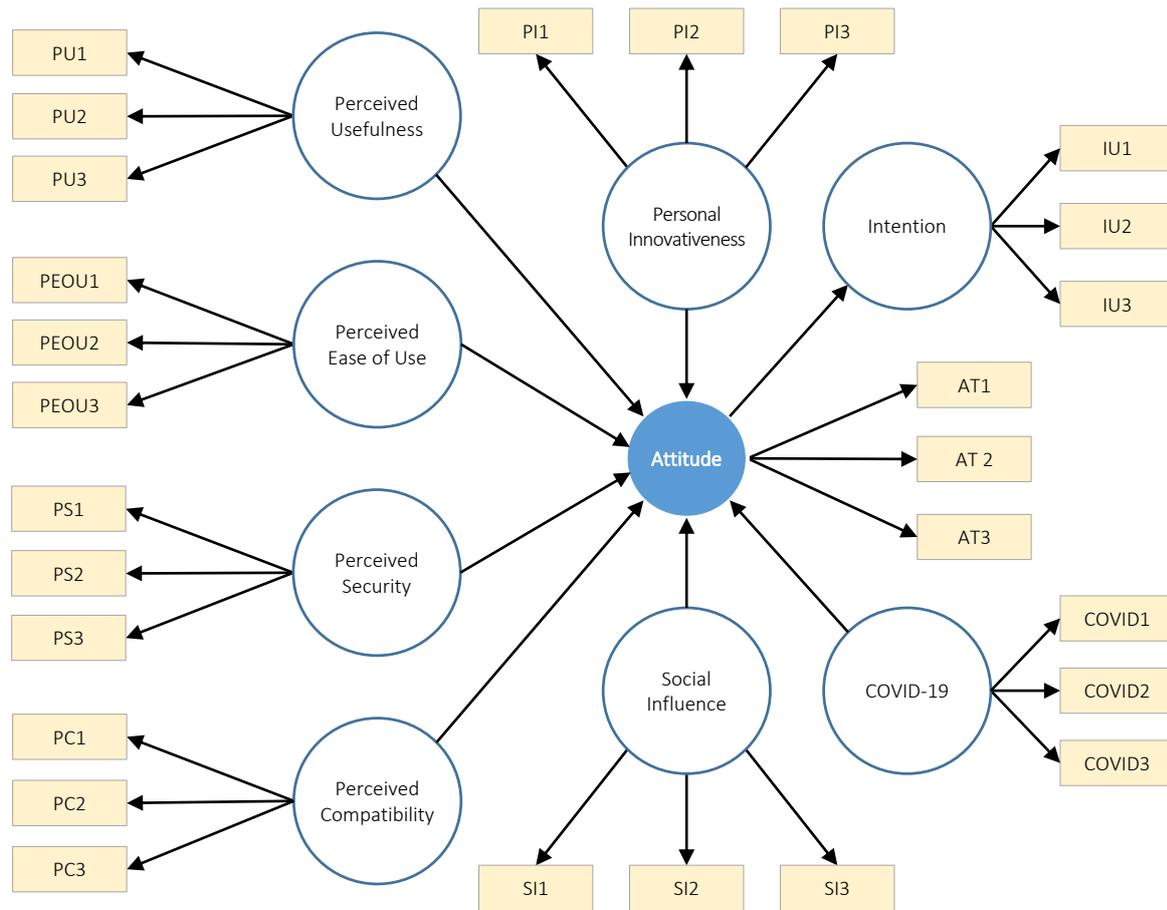
Figure 1. Research model

ment system by QR code (MPS), particularly with its contactless payment feature, during the pandemic. Perceived trust, perceived compatibility, and perceived usefulness are the three factors that have the strongest impact on customers' intention to use QR codes (MPS) during the pandemic.

Zhong and Moon (2022) studied the change in the acceptance behavior of individuals using contactless payment technology, such as mobile payments through QR Pay and facial recognition payments, during the COVID-19 pandemic. The research results have shown that perceived usefulness, perceived ease of use, and perceived security are the three factors that affect perceived value and customer satisfaction when using QR Pay. For customers using QR Pay, satisfaction is closely related to their decisions to use the services later.

Tu et al. (2022) showed the increasing number of users accepting mobile payments through QR Pay during the social blockade due to the COVID-19

pandemic. The research results show that in the context of the pandemic, perceptions of health benefits, social influence, and convenience have positively influenced the acceptance behavior of QR Pay by 248 customers surveyed for goods.

Musyaffi et al. (2021) used the extended UTAUT model together with the PLS-SEM model through a survey sample to evaluate the factors affecting the acceptance of QR payments by 205 customers in Indonesia. The research results show that perceived security is the most important factor affecting customers' intention to accept QR Pay. The factors of efficiency expectations and perceived trust are also important factors affecting the intention to accept QR Pay by customers in Indonesia during the pandemic.

In this study, a model that takes into account factors like attitude, COVID-19, personal innovativeness, perceived compatibility, perceived ease of use, perceived usefulness, and social influence is

synthesized and integrated to explain how Gen Z customers in Vietnam may decide to use QR Pay in the post-COVID-19 period. The following hypotheses are advanced in light of findings from earlier studies and the creation of the research model (Figure 1):

H1: Perceived usefulness positively affects the intention to use QR Pay of Gen Z customers through attitude.

H2: Perceived ease of use positively affects the intention to use QR Pay of Gen Z customers through attitude.

H3: Perceived security positively affects the intention to use QR Pay of Gen Z customers through attitude.

H4: Perceived compatibility positively affects the intention to use QR Pay of Gen Z customers through attitude.

H5: Social influence positively affects the intention to use QR Pay of Gen Z customers through attitude.

H6: Personal innovativeness positively affects the intention to use QR Pay of Gen Z customers through attitude.

H7: COVID-19 positively affects the intention to use QR Pay of Gen Z customers through attitude.

H8: Attitude positively affects the intention to use QR Pay of Gen Z customers.

2. METHODS

In this study, the data collection process was carried out by distributing a survey questionnaire among the participants. The sample was selected based on the convenience sampling method, which involves selecting participants who are easily accessible or available. The survey questionnaire was designed based on two well-known models: the TAM developed by Davis (1989) and the UTAUT model developed by Venkatesh et al. (2003). To ensure the accuracy and reliability of the collected data, the survey

questions were designed to cover a wide range of factors that affect the acceptance and use of technology among individuals. Additionally, the study took into account the impact of the COVID-19 pandemic variable, as reported in Jiang et al. (2021), Tu et al. (2022), and Musyaffi et al. (2021). This was done to assess whether the current situation has had any significant impact on the participants' attitudes and behavior toward technology.

The survey was conducted among Generation Z customers in Vietnam from September 2022 to January 2023, utilizing online surveys created with Google Forms. The survey comprised two sections: the initial section collected information on customer characteristics and demographic data, such as gender, age, education level, occupation, and average monthly income. The second section consisted of inquiries in nine groups of factors, as proposed in Figure 1, and was designed utilizing a 5-point Likert scale.

Before analysis, the data were checked for validity, and the variables were encoded. Out of the 444 customers who participated in the survey, 29 responses were deemed invalid due to missing or misleading information. Therefore, the final dataset consisted of 415 valid responses, which were used for subsequent stages of the study.

The study utilized the partial least squares linear structural model (PLS-SEM), widely used in current studies and presents some advantages over other methods (Hair et al., 2013). SmartPLS 3.2.7 software was used for both measurement models and linear structural equations.

The method of data analysis and processing of the study was carried out through the following steps:

(i) Evaluation of reliability by Cronbach's Alpha;

(ii) Evaluation of the stability of the scale through convergent value (convergent validity) according to Cronbach's Alpha index, composite reliability coefficient (CR), and average variance extracted (AVE);

(iii) Analyzing the discriminant of the variables in the model through the index of average variance extracted (AVE);

(iv) Measuring the fit of the model through the Chi-square index, p-value, and standardized root mean square residual (SRMR);

(v) Checking the model reliability through the bootstrapping technique.

3. RESULTS

Table 1 displays a comprehensive compilation of data concerning the demographic attributes of the survey participants. The survey offers valuable insights regarding the demographic attributes of the participants, encompassing factors such as their gender, educational attainment, and occupational status. Based on the statistical data, it is evident that a substantial majority of 79.30% of the individuals surveyed were females, whereas a comparatively smaller proportion of 20.70% were males. The results reveal that most participants, 99.30%, have completed their undergraduate education. In contrast, a small minority, comprising only 0.7%, have pursued postgraduate studies. In contrast, the respondents' occupations displayed a significant degree of diversity. The survey sample primarily comprised students, accounting for 93.5% of the total participants. In contrast, a small proportion of the individuals surveyed, 6.3%, expressed having stable employment, whereas an insignificant percentage of 0.2% disclosed involvement in part-time employment.

Furthermore, the survey also gathered pertinent data pertaining to the utilization of the QR Pay service among the participants. Among the cohort of 415 respondents belonging to the Gen Z who participated in the survey, a notable pro-

portion of 275 individuals, accounting for approximately 65.5% of the sample, reported engaging with the QR Pay service on at least one occasion. In contrast, 143 customers, constituting 34.5% of the overall customer base, had not utilized the service. The aforementioned research findings provide valuable insights into the utilization of QR Pay service among the Generation Z population, thus presenting potential advantages for businesses aiming to connect with this particular demographic group.

Table 2 presents detailed descriptive statistics for nine group variables, specifically: (i) perceived usefulness, (ii) perceived ease of use, (iii) perceived security, (iv) perceived compatibility, (v) social influence, (vi) personal innovativeness, (vii) COVID-19, (viii) attitude, and (ix) intention to use. It includes the total number of observations, mean, minimum, maximum, and standard deviation for each variable.

The PLS-SEM analysis method, implemented through the SmartPLS software, is a widely used approach for testing research models. This study evaluated the measurement model for convergent validity using Cronbach's Alpha coefficient.

The two reliability measures commonly used in academic research are the Composite Reliability coefficient (CR) and the Average Variance Extracted (AVE). Convergent validity is commonly assessed by examining the values of Cronbach's Alpha and the Composite Reliability coefficient, which are expected to exceed 0.7 (Hair et al., 2013; Chin, 1998). Furthermore, Hair (2011) recommends that each factor's component loadings should exceed 0.5. In order to

Table 1. Demographic characteristics of Gen Z customers participating in the survey

Demographic variables		Frequency (N = 415)	Percentage %
Gender	Male	86	20.7
	Female	329	79.3
Education	University	412	99.3
	Postgraduate	3	0.7
Occupation	Student	388	93.5
	Employed	26	6.3
	Part-time	1	0.2
QR Pay	Yes	272	65.5
	No	143	34.5

assess the discriminant validity, the study employed the Average Variance Extracted (AVE) measure. It is generally accepted that AVE values equal to or exceeding 0.50 are deemed suitable for this purpose, as Hair et al. (2013) suggested. By implementing this approach, the study effectively ensured that the variables exhibited a satisfactory level of differentiation. In general, these methodologies establish a robust framework for evaluating research models and guaranteeing the precision of the findings.

Table 2. Descriptive statistics of nine variables

Variables	N	Mean	Min	Max	Standard deviation
Perceived Usefulness					
PU1	415	4.248	1	5	0.852
PU2	415	4.229	1	5	0.869
PU3	415	4.354	1	5	0.771
Perceived Ease of Use					
PEOU1	415	4.287	1	5	0.831
PEOU2	415	4.311	1	5	0.784
PEOU3	415	3.983	1	5	0.955
Perceived Security					
PS1	415	3.766	1	5	0.955
PS2	415	3.795	1	5	1.003
PS3	415	3.841	1	5	0.991
Perceived Compatibility					
PC1	415	4.043	1	5	0.925
PC2	415	4.152	1	5	0.863
PC3	415	3.86	1	5	1.055
Social Influence					
SI1	415	3.289	1	5	1.268
SI2	415	3.441	1	5	1.185
SI3	415	3.436	1	5	1.252
Personal Innovativeness					
PI1	415	4.125	1	5	0.888
PI2	415	4.284	1	5	0.834
PI3	415	4.243	1	5	0.854
COVID-19					
COVID1	415	4.417	1	5	0.733
COVID2	415	3.851	1	5	1.096
COVID3	415	4.164	1	5	0.955
Attitude					
ATT1	415	4.313	1	5	0.769
ATT2	415	4.369	1	5	0.745
ATT3	415	4.251	1	5	0.815
Intention					
IU1	415	4.318	1	5	0.827
IU2	415	4.316	1	5	0.835
IU3	415	4.072	1	5	0.959

Table 3. Testing the reliability level of variables in detail

Variables	Cronbach's Alpha
Perceived Usefulness (Cronbach's Alpha = 0.898)	
PU1	0.909
PU2	0.921
PU3	0.904
Perceived Ease of Use (Cronbach's Alpha = 0.883)	
PEOU1	0.924
PEOU2	0.924
PEOU3	0.851
Perceived Security (Cronbach's Alpha = 0.893)	
PS1	0.879
PS2	0.929
PS3	0.913
Perceived Compatibility (Cronbach's Alpha = 0.890)	
PC1	0.925
PC2	0.929
PC3	0.863
Social Influence (Cronbach's Alpha = 0.918)	
SI1	0.92
SI2	0.948
SI3	0.912
Personal Innovativeness (Cronbach's Alpha = 0.923)	
PI1	0.916
PI2	0.94
PI3	0.938
COVID-19 (Cronbach's Alpha = 0.850)	
COVID1	0.869
COVID2	0.848
COVID3	0.912
Attitude (Cronbach's Alpha = 0.917)	
ATT1	0.921
ATT2	0.925
ATT3	0.932
Intention (Cronbach's Alpha = 0.906)	
IU1	0.915
IU2	0.933
IU3	0.903

Table 3 presents a detailed analysis of Cronbach's Alpha coefficients for 27 component questions and nine factor groups. The results show that all of the questions and Cronbach's Alpha coefficients for the nine groups exceed 0.7, meeting the reliability requirements for further analysis. This indicates that the data collected for this study are highly reliable and can be used for future research (Hair et al., 2013; Chin, 1998). Ensuring the reliability of the data is crucial as it affects the validity of the research findings. Therefore, this outcome should be viewed as a positive accomplishment and a solid foundation for any future studies related to this topic.

Table 4. Testing the reliability, stability, and discriminant validity of variables

Variables	Cronbach's Alpha	Average Variance Extracted (AVE)	Composite Reliability
Perceived Usefulness	0.898	0.831	0.936
Perceived Ease of Use	0.883	0.811	0.928
Perceived Security	0.893	0.824	0.933
Perceived Compatibility	0.890	0.821	0.932
Social Influence	0.918	0.859	0.948
Personal Innovativeness	0.923	0.867	0.951
COVID-19	0.850	0.769	0.909
Attitude	0.917	0.858	0.948
Intention	0.906	0.841	0.941

Table 4 presents the results of the reliability analysis of the proposed research model. The analysis includes Cronbach's Alpha coefficient, Average Variance Extracted (AVE), and Composite Reliability (CR) of the nine factor groups. As shown in Table 3, the Cronbach's Alpha coefficients of all nine factor groups are higher than 0.7, indicating satisfactory internal consistency. In addition, the AVE and CR indices of all factor groups are also greater than 0.7, confirming the stability and differentiation of all factors. It is worth noting that high AVE and CR values can be attributed to the factors being highly correlated. Based on these findings, the proposed research model is reliable and can be used for the next step of the PLS-SEM analysis (Hair et al., 2013; Chin, 1998).

The study conducted structural model testing using the bootstrapping test to validate the research model. The results of the PLS-SEM model, presented in Figure 2, indicate that the Chi-square statistical value of the model is 1617.504. According to
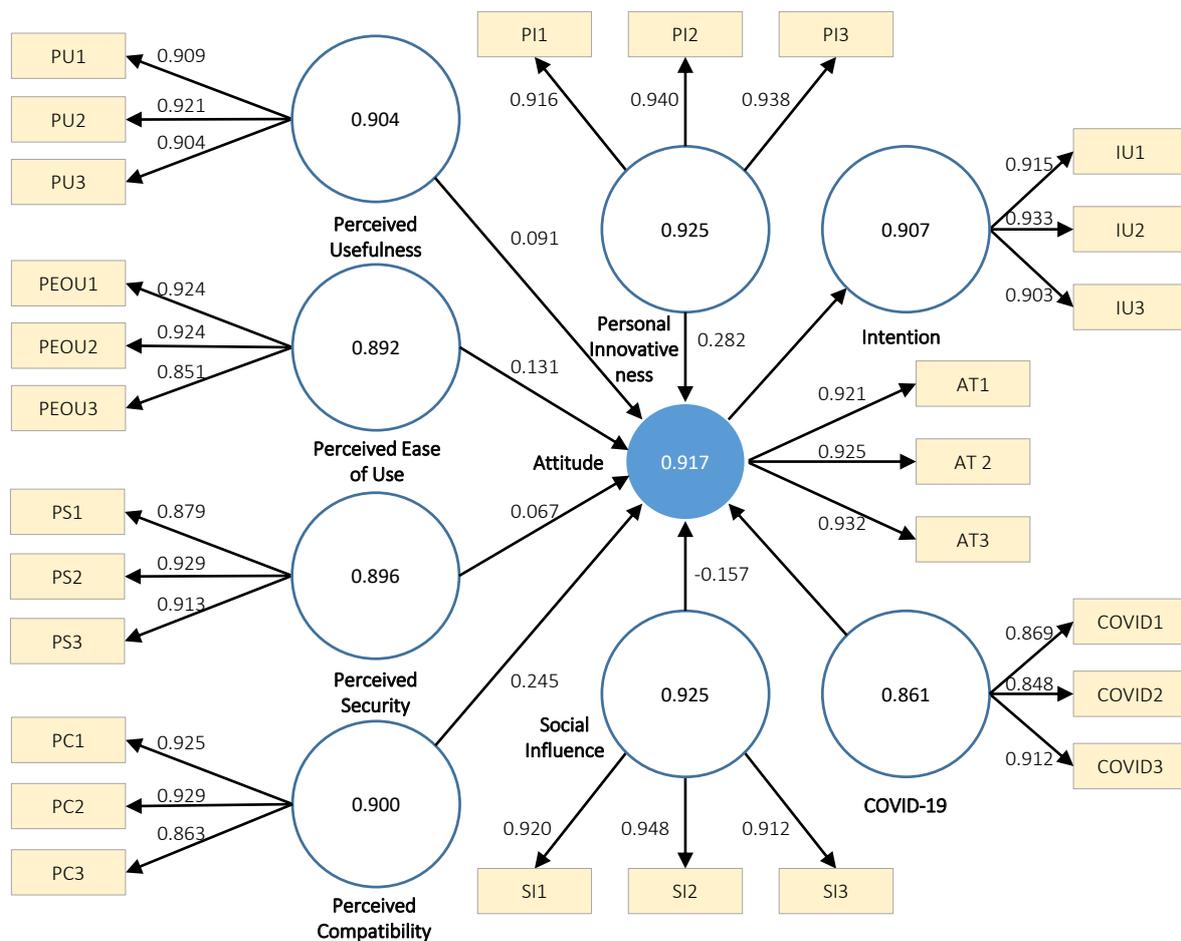

Figure 2. Results of PLS-SEM model analysis

Table 5. Hypotheses testing results

Hypothesis	Relationship	β	t–stats	P–Values	Decision
H1	Perceived Usefulness → Attitude → Intention	0.071	1.875	0.061	Supported
H2	Perceived Ease of Use → Attitude → Intention	0.102	2.571	0.01	Supported
H3	Perceived Security → Attitude → Intention	0.052	1.486	0.138	Not supported
H4	Perceived Compatibility → Attitude → Intention	0.19	4.3	0	Supported
H5	Social Influence → Attitude → Intention	−0.122	4.031	0	Supported
H6	Personal Innovativeness → Attitude → Intention	0.22	4.167	0	Supported
H7	COVID−19 → Attitude → Intention	0.227	5.213	0	Supported
H8	Attitude → Intention	0.778	25.669	0	Supported

Hulland (1999), an SRMR value less than 0.1 indicates a well-fitted model. The SRMR value obtained in this study is 0.049, less than 0.1, indicating that the research model is consistent with the reality of Gen Z customers' intention to use QR Pay in Vietnam.

In order to enhance the comprehensiveness of the research findings, the present study employed the bootstrapping technique to assess the reliability of the model. The statistical technique at hand entails the process of resampling the available data in order to derive the characteristics of a statistical estimator. In this particular instance, the model underwent 500 resampling iterations (n = 500) with an initial sample size of 415 observations. The findings from the analysis of 500 observations indicate that the initial weights exhibited statistical significance, as evidenced by the mean weights obtained through the bootstrapping technique falling within the 95% confidence interval. This suggests that the estimates within the model can be reliable with a significant level of confidence.

It is worth noting that the bootstrapping technique has become increasingly popular in recent years as a means of testing the reliability of a model. By resampling the data, this technique provides a more robust estimate of the model's properties, allowing for a more accurate analysis of the results. In this study, the bootstrapping technique allowed for a more thorough evaluation of the model's reliability, which is an essential aspect of any research endeavor. The study used the bootstrap resampling technique (5000 resamples) to test the path coefficient's significance and investigate the hypotheses' significance. Figure 2 and Table 5 describe the path coefficient (β), t-statistics, and p-value of each hypothesis.

The results presented in Table 6 show that H1, H2, H4, H5, H6, H7, and H8 are supported. H3 is re-

jected, indicating that the perceived security factor has no significance and does not affect Gen Z customers' intention to use QR Pay in Vietnam in the post-COVID-19 period. The supported hypotheses show that attitude, COVID-19, personal innovativeness, perceived compatibility, perceived ease of use, and perceived usefulness are all meaningful and positively impact customers' intention to use QR Pay. Only the social influence factor has a negative impact on Gen Z customers' intention to use QR Pay in Vietnam. In conclusion, the study provides insights into the factors influencing Gen Z customers' intention to use QR Pay in Vietnam. The research model and results obtained are reliable and consistent with reality.

4. DISCUSSION

The investigation yielded fascinating results concerning the study's goals. There is empirical evidence that, in the wake of the COVID-19 pandemic, Generation Z consumers in economically underdeveloped developing nations like Vietnam are more likely to use QR Pay.

According to H8 (β = 0.778, p-value = 0.000), it can be inferred that the attitude factor exerts the most significant and direct influence on the intention of Gen Z customers in Vietnam to use QR Pay during the post-COVID-19 era. This factor is directly and significantly influenced by several factors, namely COVID-19, personal innovativeness, perceived compatibility, perceived ease of use, perceived usefulness, and social influence. These findings support Suebtimrat and Vonguai (2021), Liébana-Cabanillas et al. (2015), and Sang Ryu and Murdock (2013).

Furthermore, H7 (β = 0.227, p-value = 0.000) indicates that the COVID-19 factor exerts the sec-

ond most significant influence on the intention of Generation Z customers to use QR Pay in the period following the COVID-19 pandemic. Following the COVID-19 pandemic, there has been a notable rise in health consciousness among Gen Z consumers in Vietnam. These individuals are inclined to utilize contactless payment methods, specifically QR Pay, as a precautionary measure against the spread of epidemics. This shift in behavior is driven by their desire to safeguard their health and their families. The findings presented in this study align with Tu et al. (2022), Jiang et al. (2021), and Musyaffi et al. (2021), which also investigated the impact of the COVID-19 pandemic on individuals' inclination to use mobile payment methods.

H6 (β = 0.22, p-value = 0.000) demonstrates that the personal innovativeness factor has a statistically significant and positive influence on the intention of Generation Z customers to use QR Pay in the period following the COVID-19 pandemic. It ranks as the third most influential factor subsequent to attitude and COVID-19. The younger generation of consumers in Vietnam, commonly referred to as Generation Z, exhibits a strong inclination toward embracing innovation and actively engaging with novel products and services, such as QR Pay. Consequently, Tu et al. (2022), Jiang et al. (2021), Suebtimrat and Vonguai (2021), and Liébana-Cabanillas et al. (2015) provided empirical evidence supporting a positive association between personal innovativeness and the intention to use QR Pay.

H4 (β = 0.19, p-value = 0.000) demonstrates that the perceived compatibility factor exerts an indirect and positive influence on the intention of Generation Z customers to use QR Pay in the period following the COVID-19 pandemic, mediated by the attitude factor. Perceived compatibility emerges as the fourth most influential factor out of the seven factors that impact the intention of Gen Z customers in Vietnam to adopt QR Pay in the post-COVID-19 era. This finding underscores the significance of the alignment between the QR Pay service and the Gen Z customer segment, as it plays a crucial role in customers' decision-making process regarding service utilization. This finding is corroborated by Türker et al. (2022), Jiang et al. (2021), Hairani et al. (2021), Suebtimrat and Vonguai (2021), and Liébana-Cabanillas et al. (2015).

H2 (β = 0.102, p-value = 0.010) demonstrates that the perceived ease of use factor exerts a significant, indirect, and positive influence on the intention of Gen Z customers in Vietnam to use QR Pay during the post-COVID-19 era, mediated by the attitude factor. This discovery provides empirical evidence reinforcing the significance of the technology acceptance model (TAM) and its assertion regarding the positive association between the perceived ease of use construct and the intention of Generation Z consumers to adopt technology products and services, such as QR Pay. This conclusion is further substantiated by Türker et al. (2022), Zhong and Moon (2022), Musyaffi et al. (2021), and Hairani et al. (2021).

H1 (β = 0.071, p-value = 0.061) offers intriguing insights. The findings indicate that the perceived usefulness of QR Pay directly influences the attitude factor and indirectly influences the intention to use QR Pay among Generation Z customers in Vietnam. As a result of the COVID-19 pandemic, individuals belonging to Generation Z have exhibited a heightened level of consciousness regarding the advantages associated with QR Pay. The company's wide array of services and streamlined processes facilitate the prompt attainment of customers' objectives and intentions. QR Pay has emerged as a feasible solution to the challenges presented by the global pandemic, enabling customers to conduct contactless transactions conveniently from their residences. This discovery aligns with prior empirical investigations on mobile payments and QR Pay in various countries and regions. The scholarly sources indicate that QR Pay is not merely a transient phenomenon but rather a dependable and expedient payment method that is expected to garner further popularity in the foreseeable future (Türker et al., 2022; Zhong & Moon, 2022; Eren, 2022; Hairani et al., 2021).

H5 (β = −0.122, p-value = 0.000) suggests a significant and negative relationship between social influence and the intention to use QR Pay among Gen Z customers in Vietnam. The findings presented herein are in opposition to the conclusions drawn by Tu et al. (2022) and Suebtimrat and Vonguai (2021). The erosion of trust among Gen Z customers in Vietnam, specifically about their decision to use QR Pay, can be attributed to fraudulent activities occurring through media and social

networks. In further explication, social influence pertains to the influence exerted by an individual's peers or social networks on their behavior, beliefs, or attitudes. In the specific context of QR Pay adoption among Generation Z consumers in Vietnam, it is plausible that the influence exerted by their peers or social networks could potentially dissuade them from utilizing QR Pay due to apprehensions regarding fraudulent practices. This finding holds substantial importance as it contradicts prior research that has posited a favorable influence of social factors on the inclination to use QR Pay.

Moreover, the erosion of trust among Generation Z customers in Vietnam could potentially have broader ramifications for the QR Pay sector within the nation. There is a potential for the adverse effects of social influence on the intention to use QR Pay to dissuade Generation Z customers from adopting the service entirely. The potential consequences of this could have a substantial influence on the expansion and long-term viability of QR Pay in Vietnam. This region has been recognized as a pivotal sector for advancement within the nation's financial sector. The discovery that social influence exerts a substantial and adverse influence on the inclination to use QR Pay among Generation Z consumers in Vietnam constitutes a noteworthy addition to the existing body of knowledge, particularly within the framework of the nation's swiftly expanding financial sector. This discovery emphasizes the necessity for additional investigation into the determinants that impact the inclination of Generation Z consumers to use QR Pay. Furthermore, it underscores the requirement for tactics to mitigate apprehensions regarding fraudulent practices and the erosion of trust.

CONCLUSION

The study has identified seven primary factors that influence the intention of Generation Z customers in Vietnam to use QR Pay. These factors are presented in a specific order. Attitude refers to an individual's evaluative judgment or predisposition toward a particular object, concept, or behavior. COVID-19, the novel coronavirus disease, is a highly contagious respiratory illness caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). Personal innovativeness refers to an individual's inclination or propensity to adopt and utilize new technologies or innovations. Perceived compatibility refers to an individual's perception of how well a new technology or innovation aligns with their values, beliefs, and needs. Perceived ease of use refers to an individual's subjective assessment of the effort required to understand and operate a new technology or innovation. Perceived usefulness refers to an individual's perception of how much a new technology or innovation can enhance productivity, efficiency, or overall performance. Social influence or peer pressure affects people's behavior and attitudes. Among these factors, only the attitude factor has a direct impact, while the remaining six factors indirectly impact the intention of Gen Z customers to use QR Pay in Vietnam.

Although the study offers valuable insights, it is essential to acknowledge its inherent limitations. Initially, the study was predominantly carried out within the urban region, potentially limiting its ability to comprehensively depict Vietnam as a whole. In order to effectively address this matter, it is recommended that future research endeavors encompass rural areas and diverse regions within the country, thereby ensuring a more comprehensive and representative sample. Furthermore, the study employed the convenience sampling technique, resulting in a sample primarily composed of individuals with higher educational attainment, typically at the university level or beyond. The present study's findings may not be generalizable to all cohorts of Gen Z consumers in Vietnam. To enhance the external validity of future research, employing a more diverse and representative sample is recommended. Finally, it should be noted that although the sample size of 415 customers in the study is noteworthy, it may still be insufficient to accurately represent the entire study population in Vietnam. Future research endeavors may benefit from including a larger sample size to encompass a more diverse array of customers, thereby enhancing the robustness and reliability of findings.

AUTHOR CONTRIBUTIONS

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