



Exploring the Impact of Perceived Usefulness on Intention to Use Mobile Payments with QR Codes:

Kankale Ashok Purushottam

Ph.D Research Scholar

Department of Computer Science and Engineering
Kalinga University, Raipur, Chhattisgarh-India

Dr. Rajesh Keshavrao Deshmukh

Department of Computer Science and Engineering
Kalinga University, Raipur, Chhattisgarh-India

Abstract:

In the digital age, traditional financial systems have given way to digital ones. Cashless payments via cellphones or mobile payment systems are growing in popularity due to the widespread use of smartphones and the internet. Among the cashless payment methods that are currently available is the Quick Response (QR) code mobile payment. This study examines Indian millennials' intention to use QR code mobile payment through the expanded Technology Acceptance Model (TAM) theory. A convenience sample was used in the cross-sectional study design. A survey that was disseminated via Google forms on different social media platforms was used to gather data.

To analyze the data, multiple linear regression analysis was used. The findings demonstrated that the intention of Indian millennials to utilize QR code mobile payment as a payment method is significantly influenced by perceived usefulness, perceived risk, hedonic incentive, and performance expectancy. On the other hand, desire to utilize QR code mobile payment was not predicted by perceived ease of use or social impact.

This research fills a vacuum in the body of knowledge regarding consumer behavior, digital payments, and technology acceptability. In addition, the government can include more QR code applications into a wide range of services it offers by using the findings of this study as a foundation for retailers and producers of QR codes to better understand and service their clientele.

Keywords:

Digital financial systems, Cashless payments, Mobile payment systems, Quick Response (QR) code, Technology Acceptance Model (TAM), Indian millennials, Perceived usefulness, Perceived risk

Introduction:

Without a doubt, mobile technology has changed the world. The mobile phone industry has seen a dramatic shift since the release of smartphones. The proliferation of smartphones, in conjunction with technological advancements, the internet, and the digital world, has not only brought about a significant shift in people's behaviors, but it has also beyond most people's expectations in terms of the shift from analog to digital devices. These days, smartphones have an impact on every part of human existence, and living without one is unthinkable. As per the findings of Statista (2023), the global smartphone user base in 2022 was at 6.567 billion, signifying around 86% of the global populace and expanding at a yearly pace of 4.9 percent. Ninety percent of people who own smartphones carry their device at all times. Smartphone alternatives are a natural development and expansion as individuals depend more and more on their cellphones to do their everyday chores.

The world of financial transaction services has entered a new era marked by the explosive rise of mobile technologies. It is favorably influencing the shift from cash-based to cashless transactions.

Global demand for cashless transactions is rising gradually, and their popularity is growing (Chen & Jiang, 2022; Jakubowska, 2017; Shukur et al., 2022). Making or receiving payments without actual cash is known as a cashless

transaction; these are typically done using cards or other electronic means (Rahman et al., 2020). Nowadays, practically all retail stores, food and beverage establishments, supermarkets, and street vendors accept cashless payments. They are chosen for everyday financial transactions since they are a quicker and more efficient technology (Alam et al., 2021).

Furthermore, compared to cash transactions, cashless payments made online and through mobile banking applications (apps) are less expensive (Ananda et al., 2020). These factors make cashless transactions the preferred method.

Mobile phones are among the many technological devices that can be used to make cashless payments. Dahlber et al. (2015) distinguish between two categories of mobile payment systems: proximity and remote. With the former, customers can use remote payment servers or short messaging services (SMS) to pay for online transactions made through mobile banking and shopping. The latter is a payment option, like paying with a QR code, that can be used for dining out, ticket purchases, or point-of-sale (POS) transactions.

A QR code is a scannable, two-dimensional code that functions similarly to the conventional barcode that is commonly found on merchandise. Because QR codes have greater storage flexibility and can hold more data, they are more efficient (Crompton et al., 2012). The inexpensive cost of QR codes for consumers and businesses is their greatest benefit. To make a purchase, users only need to open the mobile banking app or electronic wallet, scan the QR code, confirm the amount, and complete the payment. Furthermore, setting up pricey POS terminals is not necessary for stores, particularly the smaller ones. In this manner, shops can take electronic payments with just a sticker containing a QR code. Retailers only need to show a QR code on the payment counter in order to accept payments from any consumer, bank, or electronic wallet. The account is immediately credited with the funds. Because it assures compatibility, payment using a QR code is advantageous for banks, mobile operators, and providers of mobile devices (de Reuver & Ondrus, 2017).

Notwithstanding the established advantages of QR code mobile payments, the technology is still in its infancy and has very low and sluggish penetration rates in India (Hairani et al., 2021; Hajazi et al., 2021; Osman & Din, 2022). This study's motivation stems from the fact that, although empirical research in this field is currently sparse and unestablished globally (Ashrafi & Easmin, 2023; Chang et al., 2021), it is particularly so in developing nations like India (Aris et al. 2022). Furthermore, distinct customer behaviors, beliefs, and values account for the sluggish adoption of QR code mobile payments in this nation (Aris et al., 2022).

Because the millennial generation is a prominent group in India, this study focuses on them (Agil et al., 2022). Millennials are a big segment of the market and a desirable target for many marketers since they are known for being democratic, adaptive, and open-minded to the issues of contemporary society (Lestari, 2020). Since they make up the majority of the nation's ethnic population, they are also a target group in this study.

57.8% of the population is comprised of them (Department of Statistics India, 2023). Their size and purchasing power (Amin & Hassan, 2022; Hasbullah et al., 2022) make them the largest generation and ethnic group, making this an appealing chance to study these sectors. In response to this claim, this study investigates Indians' intricate and fascinating adoption of QR code mobile payments, particularly among millennial.

In order to forecast consumer intention in assessing the acceptability of new technologies, such QR code mobile payment, this study expands the Technology acceptability Model (TAM), a popular model for analyzing the acceptance of new technical advancements. The intention of Indian millennials to use QR code mobile was investigated using the extended TAM model.

LITERATURE REVIEW

Model of Acceptance Theory

Davis created the Technology Acceptance Model (TAM) in 1989. The model is a development of Ajzen's (1991) Theory of Planned Behavior (TPB) and Fishbein and Ajzen (1980), as well as Ajzen and Fishbein (1975), Theory of Reasoned Action (TRA). Social psychology theories like TRA and TPB make an effort to explain behavior in terms of intentions.

TAM was first created by Davis (1989) to explain the variables influencing computer acceptance (Rigopoulos & Askounis, 1970). In the modern era, TAM has proven to be a dependable, potent, and economical paradigm for gauging user adoption of technology (Davis, 1989; Davis et al., 1989).

Since its release, TAM has been employed as a research paradigm for a range of technologies and situations to forecast technological acceptance. A large number of studies have used the TAM model, particularly in the QR code mobile payment space (see, for example, A. Rosli et al., 2020; Aris et al., 2022; Hajazi et al., 2021; Ibrahim et al., 2019). This model's

popularity can be attributed to its simplicity, accuracy, and applicability to a broad range of information systems (Suhartanto et al., 2020; Venkatesh & Morris, 2000).

A research framework was modified and the initial TAM was increased in the current study. Three elements—perceived usefulness, perceived ease of use, and intention—were carried over from the original TAM into the proposed model. Four additional factors—perceived risk, social influence, hedonic motivation, and performance expectancy—were added.

Since intention is what motivates human behavior, it is still the subject of much investigation across many disciplines. The construct is currently commonly used for user technology acceptance, such as TAM, and was first created in the context of TRA and TPB. Ajzen (1985) defined intention as trying to carry out a particular behavior as opposed to really doing it. It is the need to behave in a particular way in order to possess, give away, or make use of products or services. Fishbein and Ajzen (1975) also mentioned that a behavior's aim can foretell its actual course.

Moreover, intention, as defined by Warshaw and Davis (1985), is the degree to which an individual intentionally intends to carry out or abstain from doing a specific future behavior. Consequently, intention serves as a measure of a person's strength or determination to participate in or carry out a specific behavior in the future (Ajzen, 1991). A strong desire to accomplish one's goals that will not be deterred by whatever is known as intention. In contrast, a poor consequence will result in a negative attitude toward the motivating reasons that impact a particular behavior. A person who recognizes that completing a behavior will have a good attitude, belief, and viewpoint on the behavior. 52 The more strongly one desires to engage in a behavior, the more probable one is to do so. Therefore, in this study, intention can be interpreted as the user's readiness to utilize or not use mobile payments using QR codes in the future.

Numerous studies conducted globally, including in India, have examined the intention to use mobile payments with QR codes in the past (refer to A. Rosli et al., 2020; Chen, 2018; Chuah & Balachandran, 2019; Hajazi et al., 2021; Hamzah et al., 2023; Ibrahim et al., 2019; Karim et al., 2020; Le, 2022; Lim et al., 2019; Musyaffi et al., 2021; Suebtimrat & Vonguai, 2021; Suo et al., 2022; Tu et al., 2022; Yan et al., 2021). Mixed and inconsistent outcomes result from variations in study determinants, measurement tools, and samples.

In addition, research on QR code mobile payments is still in its infancy and has not been extensively studied in India. Consequently, more research should be done on the study on the intention to adopt QR code mobile payment, particularly among Indian millennials.

Perceived Utility

TAM uses perceived utility as a classic variable. According to Davis (1989), users' subjective perception that utilizing particular technologies will enhance their productivity at work is known as perceived usefulness. When a system offers several advantages, such improving productivity, usefulness, and job organization, a person is more likely to intend to use it (Winarno et al., 2021). If people think using technology would help them, they will utilize it, and vice versa.

The correlation between perceived usefulness and intention has been thoroughly investigated in numerous prior research investigations. Accordingly, one of the factors influencing the adoption of mobile payments that has been researched the most is perceived utility (Dahlberg et al. 2015). Researchers Sang Ryu and Murdock (2013) and Senali et al. (2022) found a strong positive correlation between the intention to use mobile payments with QR codes and the perceived utility of the technology. Similar relationships between the two constructs have been observed in other studies on QR code mobile payment (see, for instance, Aris et al., 2022; Chang et al., 2021; Ibrahim et al., 2019; Türker et al., 2022). Studies by Sukwadi et al. (2022), Agardi et al. (2022), Ozkaya et al. (2015), and Tang et al. (2022) discovered a negligible association between the two, though. Thus, more research is needed to determine how perceived utility affects intention.

Consequently, this suggests the following theory:

H1: The intention to use mobile payment with QR codes shows a positive correlation with perceived utility.

Framework

The research model and hypotheses that were developed are shown in Figure 1, which also serves as the study's goal. In response to the comments in the literature review section, this model and its hypotheses were built.

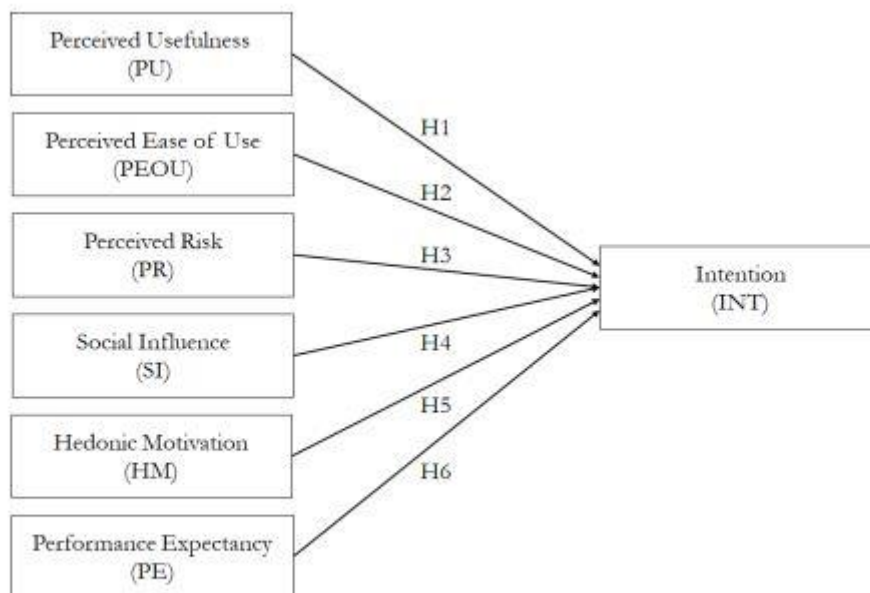


Figure 1: Research Model and Hypotheses

METHODOLOGY

Perceived utility (PU), perceived ease of use (PEOU), perceived risk (PR), social influence (SI), hedonic motivation (HM), and performance expectancy (PE) with intention (INT) to utilize QR code mobile payment are all examined in this field study. Google forms were used to distribute the online survey over a number of social media sites, including WhatsApp. Using a questionnaire method is a quick, easy, cost-effective way for researchers to gather a lot of data from a wide range of participants.

The online survey was also selected because of its helpful validation capabilities, which guarantee that respondents have answered every question completely.

Examine Example

millennial consumers who regularly engage in the payment process make up the target audience for this study. Only customers between the ages of 18 and 35 were selected because this study is of importance to and the millennial generation. According to Krejcie and Morgan's (1970) suggestion, the target sample size for a population exceeding one million was at least 384 samples. Unfortunately, time constraints only allowed for the collection of 214 samples. However, the 214-person sample size is thought to be adequate for the regression and correlation analysis that this study is trying to perform. Hair et al. (2018) state that for most study scenarios, a sample size of 100 samples is recommended, and for simple regression analysis, it should include at least 50 participants.

Nonetheless, suggestions for sample size for regression and correlation studies vary throughout scholars. VanVoorhis and Morgan (2007), for instance, suggested 30 participants for a single variable. Chuan (2006) and Cohen (1992) determined that 116 samples were needed to research multiple regression and 85 samples were needed to study correlation analysis. On the other side, Taasobshirazi and Wang (2016) proposed that in order to get more trustworthy results, the minimum sample size should be between 50 and 100. In light of the previous suggestion, 214 persons make up an adequate sample size for the regression and correlation studies.

Analyzing Data

Multiple linear regression (MLR) analysis was used in this study to evaluate the hypotheses. A linear relationship between certain independent factors and a dependent variable is established in research using multiple linear regression (MLR). Specifically, MLR was employed in this study to gauge the degree of correlation (linear relationship) between customers' views and usage intention. Finding the proportion of variance in the six consumer perception characteristics that can significantly explain customer intention is also helpful.

RESULTS

The Profile of Respondents

Male respondents made up 59.3% of the study's participants, compared to 40.7% for female respondents. Since the study was centered on millennials, all of the participants were Malays, , and ranged in age from 18 to 35. Regarding education, a majority of the participants (61.2%) own a bachelor's degree or above, while 22.9% hold a diploma, 14% hold a foundation/matriculation/A-level certificate, and a minority (1.9%) hold master's and doctoral degrees.

Dependability Evaluation

Using Cronbach's alpha, the internal consistency of the items that represented each factor was evaluated in order to determine reliability. A common rule of thumb of 0.70 can be used to determine Cronbach's alpha (Hair et al., 2006; Nunally, 1978). Table 2 validates the 56 reliability of the questionnaire items by demonstrating that the Cronbach's alpha value for each of the seven items is greater than 0.70, satisfying the usual rule. The number of items and sample of questionnaire items used as measures for each construct are also displayed in Table 1.

Table 1: Sample of Questionnaire Items with Cronbach's Alpha for Each Section

Construct	No. of Items	Sample Item	α
INT	5	I intend to start using QR code mobile payment to make daily transaction.	.747
PU	4	Using QR code mobile payment makes the handling of payment easier.	.724
PEOU	4	Learning to use QR code mobile payment is easy for me.	.779
PR	5	I am concerned about QR code mobile payment service will lead to transaction fraud.	.873
SI	5	My friends think that using QR code mobile payment is safe and secured.	.746
HM	4	Using QR code mobile payment is enjoyable.	.825
PE	4	Using QR code mobile payment helps me accomplish transaction more quickly.	.751

Note: INT (intention), PU (perceived usefulness), PEOU (perceived ease of use), PR (perceived risk), SI (social influence), HM (hedonic motivation), and PE (performance expectancy).

Analysis of Multiple Linear Regression

To test the suggested hypotheses, multiple linear regression (MLR) analysis was performed. The strength or degree of the association between two or more independent variables and the dependent variable can be simultaneously ascertained using MLR analysis. R has a value between 0 and 1. The stronger the association, the closer the value is to 1, and the weaker the relationship, the closer the value is to 0. The percentage contribution of the independent variable's influence on the dependent variable is determined by MLR using the determination analysis. This coefficient shows what proportion of variation in the model's independent variable may account for variations in the dependent variable. The MLR analysis in this study looked at how PU, PEOU, PR, SI, HM, and PE related to INT.

The MLR analysis summary for this investigation is displayed in Table 3. Examining the association between PU, PEOU, PR, SI, HM, PE, and INT, the R value is 0.672, suggesting that the seven variables have a strong relationship. About 45% of the variance of INT can be accounted for by all variables, with variables beyond the scope of the research model influencing and explaining the remaining 55% of the variance. The regression model's significance ($F = 28.370$, $p = 0.000$) is demonstrated by the ANOVA, indicating the rejection of the null hypothesis. Additionally, Table 4 demonstrates that there is a significant correlation between the four independent variables—PU, PR, HM, and PE—and the dependent variable, INT, with each of their p-values being less than 0.05. PEOU and SI, however, did not matter.

Table 3: Model Summary of Multiple Linear Regression Table

DV		Model Summary ^b		ANOVA ^a		IV	Coefficients ^a		t	Sig.
		R	R ²	F	Sig.		Unstandardised Coefficients	Standardised Coefficients		
							Beta	Beta		
1	INT	.672	.451	28.370	.000 ^b	Constant	.971		3.226	.001
						PU	.152	.152	2.349	.020
						PEOU	.114	.120	1.808	.072
						PR	-.077	-.135	-2.131	.034
						SI	.096	.114	1.675	.095
						HM	.277	.326	4.851	.000
						PE	.226	.225	3.434	.001

a. Dependent Variable: INT

b. Predictors: (Constant), PE, PR, PU, PEOU, HED, SI

Hypotheses Findings

This study looked into how PU, PEOU, PR, SI, HM, and PE affected INT. Two theories were not supported by the evidence, whereas four were. The study's hypothesis outcomes are summarized in Table 4.

Table 4: Summary of Hypotheses Results

Hypothesis	P Value	Indicator
H ₁ : Perceived usefulness has a positive relationship with the intention to use QR code mobile payment.	.020	Accepted

DISCUSSION

According to this study, among Indian millennials, perceptions of utility, perceived risk, hedonic motivation, and performance expectancy all have an impact on the desire to utilize QR code mobile payments. On the other hand, desire to utilize QR code mobile payment is not predicted by perceived ease of use or social impact.

Regarding H1, it was discovered that intention was significantly influenced directly by perceived usefulness. It seems sense that respondents would be more inclined to utilize the system if QR code mobile payment was easy to use and beneficial. This finding, which demonstrates a positive correlation between perceived utility and the intention to use QR code mobile payment, is in line with earlier studies (Aris et al., 2022; Chang et al., 2021; Ibrahim et al., 2019; Türker et al., 2022).

Remarkably, perceived ease of use in the instance of H2 did not significantly predict the intention to use mobile payments using QR codes. This finding indicates that although Indian millennials think the QR code mobile payment method is straightforward and user-friendly, they are skeptical about it. This could be due to a number of factors. First off, mobile payments using QR codes are still very new in India. Second, customers aren't quite ready to give up cash, credit cards, and debit cards in favor of mobile payments using QR codes. This outcome, however, is consistent with research by Aris et al. 58 (2022), Baskoro and Amini (2020), and Setiawan et al. (2022), which discovered no relationship between intention to use QR code mobile payment and perceived ease of use.

Regarding H3, it was shown that there was a negatively significant correlation between perceived danger and intention. This demographic is discouraged from using QR code mobile payments due to perceived risk, which stems from worries about fraud, privacy, and personal data. Thus, the more the ambition of Indian millennials to utilize QR code mobile payment, and vice versa, the lower their perceived danger. According to Senali et al. (2022) and Tang et al. (2022), this result is consistent.

According to H4, social influence did not significantly affect the intention to use QR code mobile payment, as demonstrated by the study's results. This finding is in line with research conducted by Ghaisani et al. (2022), Hajazi et al. (2021), Imani and Anggono (2020), and Shane et al (2016). Millennials are the primary users of the QR code mobile payment system, which has been around for a while. As such, the influence of friends, family, or other acquaintances in getting them to utilize the system is waning. Furthermore, millennials have a strong grasp of technology and are well-versed in the operation of the QR code mobile payment system. This could imply that they are unaffected by the influence and trust of other social players. Because of this, this group thinks they could use the QR code for mobile payments even if their partners choose not to. implying that users are the only ones who decide whether to use QR code mobile payments.

Hedonic motivation was the model's best predictor of H5, outperforming all other factors. This suggests that if respondents think the system is entertaining and easy to use, they are more inclined to employ mobile payments using QR codes. The results of this study suggest that QR code creators should make codes that are interesting to use, adaptable, and offer interesting material.

These results corroborate earlier studies conducted by Alalwan et al. (2017) and A. Rosli et al. (2020).

For H6, performance expectancy was a predictor of intention to use QR code mobile payment, which is consistent with other studies by A. Rosli et al. (2020), Amarullah et al. (2021), Le (2022), Shane et al. (2022), and Suo et al. (2022). The model's second-strongest predictor was performance expectancy. This group thinks that making mobile payments with QR codes is advantageous and can help them achieve their goals and boost productivity. This group is therefore more likely to employ mobile payment services with QR codes in their daily lives.

CONCLUSION

This study looked into the intentions of millennial in India to use mobile payments via QR codes.

Six study hypotheses were generated from the investigation of six antecedents of intention: perceived utility, perceived ease of use, perceived danger, social influence, hedonic motivation, and performance expectancy. Four hypotheses—perceived usefulness, perceived danger, hedonic motivation, and performance expectancy—were accepted in light of the hypothesis test results. However, the notions of perceived ease of use and social influence were disproved.

Theoretically, this study adds to the body of literature by investigating the relationship between the perceived utility, perceived ease of use, perceived risk, social influence, hedonic motivation, and performance expectancy of the QR code system and the intention of Indian millennials to use mobile payments using QR codes. Based on 214 participants, the research yields the subsequent findings. millennials in India view QR code mobile payments as: 1) helpful and practical; 2) safe and easy to use; 3) interesting, pleasurable, and delightful; and 4) helpful and capable of assisting them in reaching their objectives and boosting their productivity. But there are two things to consider: 1) They are cautious about using QR codes for mobile payments, even though the method is simple and convenient, and 2) Their social networks have no influence on them. For this reason, service providers—especially those catering to millennials—should not depend exclusively on word-of-mouth recommendations to expand their clientele. Given that the majority of millennials are tech-savvy, the emphasis should be on enhancing the system offering to make it simpler and easier to use.

Given that India intends to go cashless by 2025, policy makers, service providers, and other industry participants need to have a better understanding of how QR code mobile payments are used in the country. The government might also include additional QR code apps into a range of government services in order to further the nation's agenda. Indians should encourage the nation's shift to a highly efficient cashless society by using this kind of payment. Given that the study's target audience is , Islamic establishments and merchants, including mosques, zakat and waqf institutions, can take full advantage of QR code payments and specifically target these groups to entice them to support Islamic institutions by making zakat payments, providing sadaqa and infaq, and generating additional income. Additionally, industry players might utilize the study's findings to create a thorough business plan and useful institutional tools to encourage the expansion of mobile payments, particularly QR code systems.

This study has certain limitations even though it can aid practitioners and close a gap in the literature. Initially, the data is limited to a convenient sample, which can reduce how broadly applicable the findings are. Second, data from participants, who ranged in age from 18 to 35, was gathered for the current study. Third, other ethnic groups may view the topic differently because this survey was intended for consumers. Fourth, there may be additional factors influencing the results, as the components this study looked at explain less than 60% of the variance in the intention to select QR code mobile payment.

Future studies on consumers' intentions for mobile payments using QR codes may expand the study's parameters in order to overcome these constraints. Initially, in order to generalize the outcome, an alternative sample strategy, such random sampling, might be employed. Second, by incorporating individuals of various ages who might view QR code mobile payments from various angles. Third, by taking into account various ethnic groups or people from other developing nations like Singapore and Indonesia, as cultural and value variations may cause differences in consumer behavior. Fourth, in order to better examine this environment, future research may integrate the technological acceptance model with other pertinent theories. Fifth, future research might take into account additional factors including cultural and religious conceptions. Lastly, by using different analytical techniques, future research could replicate this study to examine consumer intentions and behavior toward different technologies (e.g., wearable technology, mobile government, and mobile health services) in a variety of contexts (e.g., finance, education, retail, government, healthcare, and hotels) and produce more insightful findings.

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