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QR CODE PAYMENT IN RESTAURANTS: CONSUMER PERCEPTION AMONG ADULTS IN DUNGUN, TERENGGANU

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Abstract:

The rapid adoption of QR code payment systems has transformed payment practices in the restaurant industry, making contactless transactions faster and more convenient for consumers. Although the use of QR payments in Malaysia increase, limited empirical evidence is available regarding consumers perceptions among the adult population within the semi-urban area such as Dungun, Terengganu. This study therefore investigates consumers' perceptions of QR code payment systems among adults in Dungun, Terengganu, focusing on perceived security, perceived usefulness, and perceived compatibility. A quantitative research design was employed, with data collected from 468 respondents through both online and face-to-face surveys. The data were analyzed using descriptive statistics, Pearson correlation, and multiple regression analysis. The findings reveal that perceived compatibility has the strongest relationship with consumer perception, followed by perceived usefulness and perceived security. Although concerns regarding security persist, the ease of use and convenience of QR code payment systems are stronger drivers of consumer adoption. The findings highlight the importance of strengthening cybersecurity measures and enhancing consumer education to reduce fraud and build greater trust in digital payment systems. This study contributes to the existing literature on digital payment acceptance and provides valuable

insights for policymakers, regulators, and businesses seeking to improve QR code payment systems in the restaurant industry.

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Consumer Perception, Digital Payment, Perceived Security, Perceived Usefulness, Perceived Compatibility, QR Code Payment



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Introduction

Nowadays in Malaysia, payments can be made even without banknotes on hand. The purchase method that was previously paid for in cash now has another option: mobile payment. According to Hajazi et al. (2021), the core functions of mobile phones are voice calls, text messaging, and rudimentary mobile computing features, such as maps, web browsing, and multimedia, to meet users' needs. But after the COVID-19 pandemic, mobile payments grew rapidly because the Ministry of Health of Malaysia issued a statement encouraging its citizens to use online transactions to curb the spread of the pandemic by limiting the exchange of banknotes. The usage of QR code payment has become one of the popular forms of cashless payments in the Malaysian restaurant sector because of the low installation costs, convenience and fast transactions it provides. With the ongoing digitalization of the restaurants, it is becoming increasingly crucial to know the customers' perception on using QR code payment services. Encik Firdaus Ghani, Senior Director of the Government Digitalization Division at Payments Networks Malaysia Sdn Bhd stated in New Straits Times that Selangor and Penang have reached 90% of online payments (Santani, 2023). Followed by Perlis, Kedah, and Perak, which reached over 60%, 80%, and 49%, respectively, showing an increase in October 2023. This shows that 90% of Malaysians are familiar with using contactless payment systems by 2023. An example of contactless payment is using regular credit and debit cards, as well as payments with Apple Pay, Google Pay, and Samsung Pay, which transmit payment information when a smartphone is tapped at a compatible payment terminal.

The QR (Quick Response) code payment method is a contactless payment method that uses a smartphone application to scan a QR code. Popularly referred to as a matrix barcode that can encode numbers, alphanumeric, kanji characters, and binary data (József Udvaros & Forman, 2023). Using the QR code, payment can be made with a mobile phone by scanning it, without

physical cash. If the customer has left cash but has a mobile phone, the payment can be made successfully. This payment was made directly to the food service establishment's bank account. Unfortunately, according to previous studies, security concerns and technology literacy are the main challenges to the adoption of QR (Quick Response) codes among Malaysians. Aishah Mohamad (2023) reports that 82% of Malaysians register their bank details on multiple mobile apps, but only 25% use different passwords, reflecting poor cybersecurity. According to Zainul (2024), the State of Scam Report 2024 states that Malaysians have been scammed, costing US\$12.8 billion (RM53.34 billion) mainly due to online fraud, highlighting the need for improved security. Identity theft is rising, as seen in a case where a Kuala Lumpur resident was scammed by someone posing as a police officer. Older adults, who prefer cash transactions and are cautious about new payment methods, are particularly vulnerable to these issues.

According to Cheng & Sabran (2021), the usability of smartphone and QR code payment systems, particularly among senior citizens and low-income individuals, is greatly influenced by user interface design and screen size. Baby boomers often experience age-related vision problems, making it more difficult for them to read smartphone screens and use digital technologies effectively. Research shows that 72.1% of Malaysian elderly persons with cognitive impairment are less likely to use digital technologies than their healthier peers (Nurul Hidayah Md Fadzil et al., 2023). Although technological advancements have addressed certain accessibility issues, they have also introduced new challenges for older adults (Bastion and Peyton, 2022). Abdullah et al. (2024) projected that by 2030, 15.3% of Malaysians will be aged 65 and above, highlighting the need for policies that improve access to digital services for this age group. Furthermore, Frishammar et al. (2023) identified a generational divide in the adoption of electronic payment systems, indicating that older adults face more barriers than younger users. This finding underscores the importance of implementing targeted educational initiatives to enhance digital payment literacy among older consumers.

In this study, adults are defined as individuals aged 18 years and above. The minimum age of respondents is based on the Age of Majority Act 1971 (AMA 1971), which stipulates that the legal age of majority in Malaysia is 18 years. Therefore, the target population for this study consists of adults aged between 18 and 59 years. This age range was selected to capture diverse consumer perspectives across different stages of adulthood, including students, working adults, and individuals approaching retirement. Younger adults between 18 and 30 years are generally more technologically proficient and are more likely to adopt digital payment solutions such as QR code payments. In contrast, older adults aged 55 to 59 may have varying levels of technological familiarity and confidence, offering valuable insights into how different age groups perceive and use QR code payment systems in restaurants. According to Shah et al. (2024), perceived ease of use significantly influences consumer satisfaction with QR code payment systems, emphasizing the importance of understanding users' experiences across different age groups.

While there have been ample studies on the use of QR code payments in major cities of Malaysia, there is little empirical information that has been produced in semi-urban places like Dungun, Terengganu. This area is special since it has a diverse adult community of individuals that include students, adults who are employed and those who work with the government, and other local community members who have different degrees of knowledge of technology. It is imperative to examine how consumers perceive cashless payments in this locality for several reasons. Based on this rationale, the study was designed to achieve the following two research objectives:

RO1: To examine the factors of perceived security, perceived usefulness, and perceived compatibility towards consumer perception on QR code payment among adults in Dungun, Terengganu.

RO2: To identify the most significant factor that influences consumer perception of QR code payment among adults in Dungun, Terengganu

Literature Review

This chapter reviews the existing literature on consumer perceptions of QR code payments in restaurants. The review focuses on three main constructs of the study: perceived security, perceived usefulness, and perceived compatibility. Previous studies have highlighted the importance of understanding diverse user experiences across age groups for using technologies in their daily activities.

QR Code Payment in Restaurants

According to Eren (2022), QR code payment is a short form for Quick Response code payment, which has been widely adopted and is very popular worldwide. The QR (Quick Response) code is the easiest way to do online transactions, including with restaurants. The QR (Quick Response) code payment system was created by Denso Wave, a Japanese company, in 1994 to facilitate auto-tracking (Chang et al., 2021). Based on Bhattacharya & Singla (2024), QR code technology was developed for industrial purpose, now it is widely used as a way of financial transaction due to its simple, fast and efficient, while based on Hong Leong Bank Berhad (2024) stated in its article, QR code payment by scanning the code with a smartphone to make a payment or contactless payments, convenient for users to make a payment. The COVID-19 pandemic and lockdown in Malaysia also led to a rise in usage of digital payments, particularly QR code payments (Jun & Bakri, 2023).

QR code payments have become increasingly popular among Malaysians due to several key factors, including government initiatives promoting cashless transactions and the widespread use of smartphones. According to Borallo (2024), the use of QR code payment systems in restaurants accelerated transaction times and enhanced customer satisfaction. Furthermore, QR code payment systems are relatively easy to implement and require minimal infrastructure, encouraging more businesses to adopt this technology and increasing market competitiveness (Yan et al., 2021). In addition, Mohamad Roseli et al. (2021) reported that consumers increasingly perceive electronic payment transactions between customers and merchants as secure, further encouraging the adoption of QR code payment systems.

Dungun, Terengganu, offers a diverse range of restaurants that cater to various culinary preferences. According to Team Rekreasi (2024), restaurants in Dungun can be broadly categorized into local Malaysian, Western, seafood, café, casual dining, and specialty restaurants, each offering unique cuisines. This study focuses on consumers who have used QR code payment systems at these types of restaurants in Dungun, Terengganu.

Perceived Security

This study uses a single main model as its theoretical framework. UTAUT model has been combined with elements of both Technology Acceptance Model (TAM) and Diffusion of Innovation (DOI). Perceived usefulness has been used from TAM, perceived compatibility has

been taken from DOI, and overall framework has been provided by UTAUT. Perceived security has been introduced in this research as many studies prove that it has an important role in adopting digital payments. The theories highlighted the Unified Theory of Acceptance and Use of Technology Model (UTAUT). Venkatesh et al. (2003) developed UTAUT to assess individuals' acceptance of technology use in their daily lives. UTAUT contains several demographic characteristics (gender, experience, age, and voluntary use) that serve as moderators (Agárdi & Alt, 2022).

Perceived security refers to the belief that personal and financial data are protected from unauthorized access, manipulation, or theft during the payment process (Gupta et al., 2022). According to Mohamad Roseli et al. (2021), the key to online transactions is security. QR code payment is an online interaction that prompts users to consider the safety of using this tool in various ways (Chang et al., 2021). Findings from Salem (2022) discuss how resistance to change and inadequate training can lead to poor digital adoption outcomes. As a result, when users feel secure using online payments, they will use them consistently in the future.

Moreover, the literature reviewed emphasizes the significance of perceived security, perceived usefulness, and perceived compatibility in shaping consumer perception of QR code payments. Research indicates that perceived security directly influences trust in digital payment systems, which in turn affects user intentions to adopt these systems (Gupta & Hakhu, 2021). A study by Siagian et al. (2022) highlights that heightened perceptions of security are associated with consumer behavioral intentions to use QR payments.

Perceived Usefulness

Perceived usefulness is also known as performance expectancy (Chang et. al., 2021). The model that has been proposed in the concept of perceived usefulness by Davis in 1989. Perceived usefulness is defined by Davis (1989) as "the degree to which a person believes that using a particular system would enhance his or her performance." In the Technology Acceptance Model (TAM), perceived usefulness is. If a system offers several benefits, such as enhancing usefulness, facilitating job organization, and increasing productivity, then a person's motivation to use it is strengthened (Winarno et al., 2021). This indicates that the potential user believes the system offers benefits and intends to use it (Uzairi et al., 2021). According to Mazhar et al. (2024), evaluating customers' perceptions of QR code use in casual dining establishments underscores the importance of a smooth purchasing experience. Consumers believe that QR code payments reduce the complexity of online payments and allow them to view their payment history (Shahril et al., 2024). According to Sariyon et al. (2020), if consumers consider making a mobile payment via a QR code that improves their goal fulfillment and is preferable to their existing payment method, they are more likely to adopt it.

Perceived Compatibility

According to Sahin (2006), as stated by Rogers (2003), the degree to which an innovation is perceived to align with the needs, values, and prior experiences of the intended user is known as compatibility. If individuals perceive QR code payments positively, they are more likely to pay with a smartphone QR code, as it fits their lifestyle. Individuals who perceive QR code payments as aligning with their current needs and lifestyle are more likely to adopt them (Wan, 2024). Perceived compatibility is strongly related to intention to use digital payment systems

because consumers prefer innovations that enrich their daily transaction activities (Nazri et al., 2024).

Furthermore, user compatibility with QR code payments significantly affects both initial choices and future usage plans (Syazwani Yahaya et al., 2023). The compatibility of a service greatly affects service acceptance, especially when users have experience using similar technologies such as mobile banking and/or online payment applications (Syazwani Yahaya et al., 2023). Perceived compatibility significantly and positively influences the goal to utilize QR code-based payment methods (Wan, 2024). For example, public perceptions significantly influence whether they plan to use QR code payments, depending on how well the system works, their lifestyle, and existing practices (Wan, 2024). Research revealed that the intention to utilize new technologies was positively influenced by a sense of compatibility (Nazri et al., 2024), underscoring the importance of compatibility for acceptance performance. If code payment was easy to use in users' banking and payment routines, compatibility was likely to be positive (Corsini et al., 2024).

Consumer Perception

In this study, consumer perception can be defined as the consumers' perception of the QR code payment system in restaurant settings. Consumer perception will cover the consumer's perception about the transaction efficiency, security, utility, comfort, recommendation intentions, and future intention to use the service. Thus, consumer perception is conceptualized as the overall perception of the QR code payment system by the consumers. Perceived security, perceived usefulness, and perceived compatibility influence consumer perceptions of and adoption of these systems (Widayat et al., 2023). Consumer perception in adults is a combination of cognitive, emotional, and behavioral responses (Gkaintatzis et al., 2019). Consumers' perception of a product's technological advancement can also influence their perceptions of its innovation, even when the technology itself is not obvious to the naked eye (Keiningham et al., 2023). According to the Cloomtrack (2025) article, consumer perception is how a consumer views a business or product based on their interactions and experiences, which can also be influenced by their personal values, beliefs, and perceptions. According to the Indeed Editorial Team (2023), it has a big impact on their choices about what goods or services to buy. The growing consumer needs for speed, variety, and personalization are met in part by restaurant technology (Yanan et al., 2024). According to Engelhardt (2022), 58% of customers love the option to pay at restaurants using a QR code. 49% of consumers prefer contactless payment methods, which is up 7% from the previous year (Nory, 2024).

Methodology

Research Design

This research used quantitative research design. A cross-sectional design was adopted for this study to examine consumer use of QR code payments from their perspectives. In today's interconnected environment, online survey tools are increasingly used to collect data on factors influencing consumers' adoption of QR code-based payment methods (Nani Shuhada Sehat et al., 2024). In a quantitative study using a self-completed survey, respondents independently fill out the questionnaire without the interviewer present.

Population and Sample

This research was conducted with adults aged 18 and above 55 of whom used QR code payments in food service in Dungun, Terengganu. Even though there are many higher learning centers in Dungun such as Universiti Teknologi MARA (UiTM), it was ensured that the participants did not comprise just the university students but also the general adult community. Information was gathered from adults belonging to all professions, all classes, all education levels, and all age brackets through personal distribution in restaurants and online as well. According to the official portal, the Ministry of Economy Department of Statistics Malaysia (2022) has stated that in 2023, the age distribution for adults in Dungun, Terengganu, for 20-29 years was 32,600, followed by ages 30-39 years was 26,400, ages 40-49 years was 18,100 and ages 50-59 years was 13,300. The total for all ages from the distribution portal is 90,400. Because the population is diverse, stratified random sampling is the sampling technique employed in this study. A recent article discusses how stratified random sampling can significantly improve data collection quality in market research by allowing researchers to obtain a more representative sample from heterogeneous populations (Halim et al., 2024). After collecting the data, the population was classified into specific groups based on age characteristics. The population is divided into strata to ensure each group is more similar within itself while maintaining distinct boundaries between strata. The target population is divided into age groups (18-25, 26-35, 36-45, 46-55, and 55+) and stratified accordingly. A stratum may have a sample size that is proportionate to or non-proportional to its size. Then, participants from each age group were randomly selected in proportion to their representation in the overall population. The advantages of stratified random sampling are that the relevant group is omitted from the survey and that greater precision is possible with a lower sample size. As a result, stratified samplings have been chosen because the method was deemed the most appropriate technique to ensure the inclusion of diverse age groups and accommodate a substantial number of surveys.

The significance of sampling in this research lies in its influence on the application of the results to the broader demographic from which the sample was drawn. The sample size for the population formula was determined using Krejcie & Morgan (1970). The research study is based on a sample size determination table developed by Krejcie and Morgan. According to the Krejcie & Morgan (1970) table ($N = 90,400$), the sample size for the research is 383 individuals. To improve the accuracy and dependability of the results, the final sample comprised 468 respondents, even though the initial sample size was set at 383 based on Krejcie & Morgan (1970). Collecting a large sample helps reduce margin errors, increase the generalizability of the results, and ensure that incomplete or invalid responses do not affect the results (Frost, 2024). With a larger sample size, the researcher can understand consumer perceptions in detail and better capture the wide range of variations within the target population.

On the other hand, nonresponse bias and inconsistent responses are common problems in survey-based research. To overcome these issues, researchers typically collect a sample size larger than the minimum required (Memon et al., 2020). This ensures that the data collected does not contain incomplete or invalid responses. Besides, the larger sample size provides higher statistical power to detect a significant relationship between two variables (KP Suresh & S Chandrashekara, 2015). Hence, collecting 468 respondents rather than 383 is in line with quantitative research practices. Therefore, the results will be more accurate and generalizable.

Instrument Development

This study was conducted using Google Forms to collect data from the population. Google Forms is an online survey tool provided by Google. Google Forms was used for the creation of custom surveys and questionnaires for the targeted sample. Multiple languages, including English and Bahasa Melayu, are chosen to make it easier for bilingual users. To help respondents understand the questionnaires, simple language is used. The structure of the Google Form consists of 6 sections: an introduction to the survey and its purpose, with frequent use of the QR code payment option; a demographic section; and an independent variable section that includes perceived security, perceived usefulness, and perceived compatibility with different sections and overall consumer perception. Respondents answered using the Likert Scale in the questionnaire, which aims to simplify the process by clarifying the range of responses and helping prevent misinterpretations during responses (Azmeem & Azami, 2023). The responding content consists of the independent variables, perceived security (PS), perceived usefulness (PU), and perceived compatibility (PC) towards consumer perception (PC) of Q.R. code payment systems in restaurants among adults in Dungun, Terengganu. The ethics of this study have been approved by UITMCT. The reference number for the REC letter is 100-UiTMCTKD (PJI.23/4) JPN. Before the actual survey, the questionnaire had been tested for content validity by academics who have knowledge about hospitality management and consumer behavior. A pre-test of 48 people was undertaken to determine the validity and reliability of the items measured. Values for the Cronbach's alpha test range from 0.738 to 0.920, which is a good measure of internal consistency.

Data Collection

Data collection is the process of gathering and measuring information from multiple sources to answer specific research questions, test hypotheses, and analyze data. Gathering primary data by administering questionnaires to specific respondents via the Google Forms platform made data collection easy, and the questionnaires were distributed to adults via social media platforms. Data was collected through two methods: face-to-face survey and online questionnaire. Face-to-face, that is, by walking around the Dungun area, Terengganu, and asking them to fill out a survey. Online is through social media, namely WhatsApp and Facebook groups. Respondents were able to complete survey questions because the questions are easy to read, using simple, short sentences. The questions in the Google Form are divided into six main sections corresponding to the research objectives.

Pilot Test

A pilot study is a preliminary research project conducted to test the feasibility and effectiveness of the methods and procedures used in a more extensive, comprehensive study. The purpose of a pilot study is to evaluate the research design, including the appropriateness of methods, clarity of questions or tasks, and suitability of data collection instruments. The reliability test for this study was conducted with 48 respondents, allowing them to become familiar with the procedures and ultimately facilitating a smoother execution of the main study. It is important to note that while pilot studies are valuable, they are not a substitute for the main study and should not be used to draw definitive conclusions about the research question.

Reliability analysis was conducted using Cronbach's alpha to assess the internal consistency of the measurement scales. A Cronbach's alpha value of 0.8 and above was considered acceptable, indicating that the instrument was reliable for the main study.

Data Analysis

The data analysis process involved descriptive statistics, reliability test, Pearson correlation analysis, and multiple linear regression analysis. Descriptive statistics were employed to summarize the demographic features of the respondents as well as score construction. The Pearson correlation analysis tested the correlations between the different variables, while the multiple regression analysis assessed the impact of various constructs on consumer perception. Under the descriptive analysis, it was to measure mean, median, mode and standard deviation to describe the main features of a data set. After the descriptive, reliability test, demographic test, descriptive test for three independent variables and dependent variable, multiple regression analysis and Pearson correlation have been done. A reliability test was determined by Cronbach's alpha, whereas the construct validity was ensured through the modification of previously tested measures from existing literature. A reliable survey instrument yields similar results under consistent conditions, which is crucial for ensuring the validity of the findings. The demographic test involves analyzing the demographic characteristics of respondents, such as age, gender, income, and education level. Understanding these variables helps contextualize the data and identify trends within specific subgroups. Descriptive tests for independent and dependent variables are the steps that summarize the basic features of the independent variables (factors presumed to influence outcomes) and the dependent variable (the outcome being measured). It includes calculation of measures like mean, median, mode, and standard deviation, which give an idea about the distribution and central tendencies of these variables. Multiple regression analysis is a statistical method that analyses the relationship between more than one independent variable and one dependent variable. It helps to ascertain how many independent variables will predict the dependent variable and how strong those relationships are. The last technique, Pearson correlation, is the statistical measure of the strength of a linear association between two continuous variables. Correlation coefficient values that are greater than 0 are positive, and those that are less than 0 are negative. A correlation coefficient of more than +1 or -1 indicates a perfect relationship, and a correlation coefficient of about 0 suggests no linear correlation.

The collected data were analysed using the Statistical Package for the Social Sciences (SPSS) version 26. Prior to analysis, data cleaning was performed to identify incomplete responses, coding errors, and inconsistencies. Descriptive statistics, reliability analysis, Pearson correlation, and multiple regression analyses were subsequently conducted to address the research objectives.

Findings

The results obtained after data analysis using Social Sciences (SPSS) version 26 are stated below. A total of 486 respondents answered using the Google Form link method, which is divided into six main sections that represent questions based on research objectives. Below is the reliability test followed by a demographic profile, descriptive analysis for three independent variables and dependent variables, multiple regression analysis and Pearson correlation.

Reliability Test

Table 1 shows the test conducted for three independent variables, which are perceived security, perceived usefulness and perceived compatibility, including consumer perception towards QR code payment in restaurants at Dungun, Terengganu, as a dependent variable. The value stated below exceeds 0.5, meaning that all independent variables and dependent variables are reliable for analysis.

Table 1: Reliability Test on Questionnaires

Construct	Item	Cronbach's Alpha	Total of Respondents
Perceived Security	PS1	0.738	468
	PS2		468
	PS3		468
	PS4		468
Perceived Usefulness	PU1	0.901	468
	PU2		468
	PU3		468
	PU4		468
Perceived Compatibility	PC1	0.896	468
	PC2		468
	PC3		468
	PC4		468
Overall Consumer Perception	OCP1	0.920	468
	OCP2		468
	OCP3		468
	OCP4		468
	OCP5		468
	OCP6		468

Demographic Profile

Table 2 shows the frequency and percentage of gender, age, education, race, marital status, monthly income, and Quick Service (QR) code experience with the method total sample size (N: 468).

Table 2: Respondents Demographic Profile

Variable	Category	Frequency (N)	Percent (%)
Gender	Female	318	67.95
	Male	150	32.05
Age	18-25 years old	48	10.26
	26-35 years old	226	48.29
	36-45 years old	137	29.27

	46-55 years old	43	9.19
	Above 55 years old	14	2.99
Education	SPM	73	15.60
	Diploma	165	35.26
	Bachelor's Degree	176	37.61
	Master's Degree	34	7.26
	PHD	8	1.71
	Others (e.g., STPM, Madrasah, Certificate, etc.)	< 1 each	<0.22 each
Race	Malay	465	99.36
	Others (Siamese, Chinese, etc.)	< 1 each	< 0.22 each
Marital Status	Married	327	69.87
	Single	128	27.35
	Other	13	2.78
Monthly Income	No income	40	8.55
	Less than RM1,999	119	25.43
	RM2,000 - RM2,999	95	20.30
	RM3,000 - RM3,999	57	12.18
	RM4,000 - RM4,999	44	9.40
	More than RM5,000	113	24.15

Based on the table above, of the total respondents, about 318 (67.95%) are female, and the remaining 150 (32.05%) are male. Then based on the age, 48 (10.26%) respondents are 18 to 25 years old, 226 (48.29%) respondents are 26 to 35 years old, 137 (29.27%) respondents are 36 to 45 years old, 43 (9.19%) respondents are 46 to 55 years old, and for over 55 years are 14 (2.99%) respondents are above 55 years old.

By level of education, 73 (15.60%) respondents have an SPM, followed by 165 (32.26%) with a Diploma. Also, bachelor's degree with 176 respondents (37.61%), master's degree with 34 respondents (7.26%), and PhD with 8 respondents (1.71%). While others with STPM, Madrasah, and Certificate with <1 each (<0.22 each percentage) respondents. The respondents' race Malay is 465 (99.36%), followed by other races (Siamese, Chinese, Indian, and Orang Asli) that represent < 1 each (< 0.22 each). The marital status of the survey respondents includes 327 (69.87%) respondents who are married, 128 (27.35%) who are single, and 13 (2.78%) who are others who are engaged.

Last part was the monthly income category; 40 respondents have no income, representing percent (8.55%). 119 respondents (25.43%) have an income of less than RM1,999, while 95 respondents (20.30%) have an income of RM2,000 - RM2,999. 57 respondents with (12.18%) income RM3,000 - RM3,999. Following with 44 respondents (9.40%), income with RM4,000 - RM4,999, and for more than RM5,000 is 113 respondents, equal to (24.15%).

Descriptive Analysis

Independent Variable 1: Perceived Security

The first independent variable for this study is perceived security. According to the table below, the mean score distribution for the perceived security while using QR code payment ranged from 4.42 to 3.61, indicating that the respondents neither agree nor disagree with the security. The findings are reported in Table 3.

Table 3: Mean Score for Independent Variables (Perceived Security)

No.	Survey Items	N	Mean	Std. Deviation
1	I believe QR code payments are secure for me to use.	468	4.42	.748
2	I feel confident that QR code payment systems have adequate fraud protection measures in place.	468	4.08	.956
3	I am aware of the potential risks of cybercrime associated with QR code payments.	468	4.30	.880
4	I trust that QR code payment systems can handle transactions effectively, even in unstable network conditions.	468	3.61	1.134

Based on Table 3, the average mean score for perceived security was above 3.0 and 4.0. The highest mean score obtained was 4.42 for item number 1; item number 2 shows a mean score of 4.08, indicating that the respondents also strongly agree, followed by item number 3, which indicates a mean score of 4.30. Those 3 items show that the respondents strongly agree that they believe in data privacy when using QR code payments in restaurants. Likewise, item number 4's mean score of 3.61 shows that respondents were neutral regarding their confidence in the reliability and security of the technology behind QR code payments.

Independent Variable 2: Perceived Usefulness

Table 4 below shows the mean score for the second independent variable, namely perceived usefulness using QR code payment in restaurants at Dungun, Terengganu. The mean values ranged from 4.51 to 4.48, showing the respondents agreed or strongly agreed with the perceived usefulness.

Table 4: Mean Score for Independent Variables (Perceived Usefulness)

No.	Survey Items	N	Mean	Std. Deviation
1	I believe that using QR code payments makes transactions faster	468	4.51	.824
2	Using QR code payments saves time compared to other payment methods	468	4.39	.901

3	QR code payments are easier to use than cash or credit/debit cards	468	4.21	.954
4	QR code payments are a convenient method of payment	468	4.48	.821

Based on Table 4 above, item number 1 showed the highest score compared to other items, with a mean score of 4.51. It means that the respondents strongly agree that the QR code payment has the belief that using QR Code payments makes transactions faster. Meanwhile, item number 4 obtained a mean score of 4.48, which is the second highest, indicating that the respondents agreed that QR code payments are a convenient method of payment. Other than that, items 2 and 3 show that the mean scores are 4.39 and 4.21. It shows that the respondents find that using QR code payments saves time compared to other payment methods and find that QR code payments are easier to use than cash or credit/debit cards.

Independent Variable 3: Perceived Compatibility

The third independent variable in this study is the perceived compatibility, which is related to consumer perception at the restaurants in Dungun, Terengganu. The mean values for perceived compatibility ranged from 4.57 to 4.44, indicating the respondents were overall satisfied with the perceived compatibility for QR code payment in restaurants at Dungun, Terengganu. The findings are shown in the table below.

Table 5: Mean Score for Independent Variables (Perceived Compatibility)

No.	Survey Items	N	Mean	Std. Deviation
1	I find it easy to understand how to use QR code payments.	468	4.57	.729
2	I find it compatible to use QR code payments with my daily financial activities.	468	4.42	.818
3	Using QR code payments fits well with how I manage my finances.	468	4.16	.997
4	I feel comfortable using my smartphone for QR code payments.	468	4.44	.814

According to Table 5, item number 1 obtained the highest mean score of 4.57, indicating that the respondents strongly agree that it is easy to understand how to use QR code payments. Item number 4 contributed to the second-highest score of 4.44, indicating that the respondents feel comfortable using smartphones for QR code payment. The mean scores of numbers 2 and 3 were 4.42 and 4.16, indicating that the respondents are comfortable using QR code payment with their daily financial activities and using QR code payments fits well with how respondents manage their finances.

Dependent Variable: Consumer Perception

The dependent variable in this study is overall consumer perception among adults in restaurants at Dungun, Terengganu. The mean scores for overall satisfaction ranged from 3.91 to 4.27, as shown in Table 6 below. This indicates that the respondents felt neutral, agree and strongly

agree toward the overall satisfaction of consumer perception among adults in restaurants at Dungun, Terengganu.

Table 6: Mean Score for Dependent Variable (Consumer Perception)

No.	Survey Items	N	Mean	Std. Deviation
1	I feel that my personal information is secure when using QR code payments.	468	3.91	.976
2	I find QR code payments to be a time-saving option during transactions.	468	4.37	.858
3	I am comfortable using QR code payment when making online transactions.	468	4.35	.861
4	I believe that QR code payments offer advantages over other payment methods.	468	4.13	.944
5	I recommend QR code payments to others.	468	4.36	.856
6	I am loyal to using QR code payment in the future.	468	4.27	.896

According to Table 6 above, item number 2 obtained the highest mean score of 4.37 for overall consumer perception, which indicates the respondents found QR code payments to be a time-saving option during transactions. The second-highest mean score of 4.36 was obtained by number 5, which indicates that the respondents recommend QR code payments to others. Item number 3 contributed to a mean score of 4.35, indicating that the respondents are comfortable using QR code payment when making online transactions. Item number 6 and number 4 obtained mean scores of 4.27 and 4.13, respectively, which shows that the respondents are loyal to using QR code payment in the future and believe that QR code payment offers advantages over other payment methods. Meanwhile, the lowest mean score of 3.91 was obtained by number 1, which shows that the respondents felt neutral that personal information is secure when using QR code payments.

Multiple Regression (Hypothesis Testing)

Table 7: Coefficient of Determination R

Model	R	R.Square	Adjusted	R Square	Std. Error of the Estimate
1	.890	.792	.791		.34746

Table 7 displays the coefficients of determination R^2 . The value of R^2 indicates that 79.2% of the total variation in the dependent variable (Consumer Perception) can be accounted for by the total variance of the independent variable (Perceived Security, Perceived Usefulness, and Perceived Compatibility).

Table 8: Coefficient Values Model

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	-.206	.110		-1.876	.061
Perceived Security	.217	.029	.201	7.607	<.001
Perceived Usefulness	.262	.035	.265	7.526	<.001
Perceived Compatibility	.545	.038	.528	14.459	<.001

The results of the multiple linear regression analysis show that all three independent variables—perceived security, perceived usefulness, and perceived compatibility—have a significant positive relationship with consumer perception (dependent variable), as their p-values are below 0.05. Specifically, perceived compatibility has the strongest impact on consumer perception ($\beta = 0.528$, $p < 0.001$), followed by perceived usefulness ($\beta = 0.265$, $p < 0.001$) and perceived security ($\beta = 0.201$, $p < 0.001$). The adjusted R^2 value of 0.792 indicates that 79.2% of the variance in consumer perception is explained by the model, demonstrating strong explanatory power.

Hypothesis Testing

Correlation Analysis

The objective of this study is to examine the factors of perceived security, perceived usefulness, and performance expectancy towards consumers' perceptions of QR code payments among adults in Dungun, Terengganu. The correlation analysis was used to examine the relationships among perceived security, perceived usefulness, and perceived compatibility with consumer perception, using SPSS Statistics and Pearson correlation.

Table 9: Pearson Correlation

Pearson correlation	Total CP	Total PS	Total PU	Total PC
Consumer Perception	1	.651**	.791**	.855**
Perceived Security	.651*	1	.540**	.586**
Perceived Usefulness	.791**	.540**	1	.794*
Perceived Compatibility	.855**	.586**	.794**	1

Table 9 shows H1 is supported by this study, as the correlation ($r = 0.651$) is moderate and positive, indicating a significant positive relationship between perceived security and consumer

perception of QR code payment. Perceived usefulness and perceived compatibility (H2 and H3) are supported by correlation values of $r = 0.791$ and $r = 0.855$, indicating a strong positive relationship, and there is a statistically significant positive relationship between perceived usefulness and perceived compatibility with consumer perception of QR code payment.

Discussion

The findings of this investigation present the following key conclusions: examining the factors of perceived security, perceived usefulness, and performance expectancy towards consumer perception of QR code payment among adults and identifying the most significant factor that influences consumer perception of QR code payment among adults in Dungun, Terengganu.

Demographic profiling (Table 3) revealed a diverse sample ($N=468$) from Dungun, Terengganu. The majority of those answering the surveys were female ($N=318$, 67.95%) and male ($N=150$, 32.05%), primarily comprising adults aged 26-35 years (48.29%) and others aged 18-25, 36-45, 46-55, and above 55 years old. Predominantly holding bachelor's degrees (37.61%) and including SPM, Diploma, master's degree, PHD and others (STPM, Madrasah and Certificate). The majority race is Malay (99.36%) with other races (Siamese, Chinese, Indian and Orang Asli). Marital status, married leading with (69.87%), followed by single and other. Monthly income less than RM1,999 (25.43) following with no income, income RM2,000 - RM2,999, RM3,000 - RM3,999, RM4,000 - RM4,999 and more than RM5,000.

The first objective of this study is to examine the factors of perceived security, perceived usefulness, and performance compatibility towards consumers' perceptions of QR code payments among adults in Dungun, Terengganu. Based on the search in descriptive analysis, perceived security, perceived usefulness and perceived compatibility show a positive relationship. In this study, perceived security had a moderate positive relationship with consumer perception ($r = 0.651$, $p < 0.001$). While respondents expressed confidence in the security of QR code payments (Mean = 4.42), there was some uncertainty about fraud protection measures (Mean = 4.08) and the system's reliability in unstable network conditions (Mean = 3.61). According to Mohamad Roseli et al. (2021), the key to online transactions is security. These results imply that even while consumers believe QR code payments to be generally safe, adoption may still be limited by worries about fraud and cybersecurity. QR code payment is an online interaction, prompting users to consider the safety of using this tool in various ways (Chang et al., 2021). Findings from Sahin (2006) discuss how resistance to change and inadequate training can lead to poor digital adoption outcomes. Because of that, when users feel the security found in using online payment, they will use it continuously in the future.

Perceived usefulness turned out to be a reliable indicator of consumer perception, with a significant positive correlation ($r = 0.791$, $p < 0.001$). The respondents strongly agreed that QR code payments speed up transactions (Mean = 4.51). This shows that the potential user believes the system provides benefits and intends to try to use it (Uzairi et al., 2021). Additionally, it saves time compared to other payment methods (Mean = 4.39) and is convenient to use (Mean = 4.48). A person's purpose in utilizing a system is enhanced if the system delivers many benefits, such as aiding work organization, boosting usefulness, and increasing productivity (Winarno et al., 2021). These findings are in line with recent research showing that time efficiency and ease of use are critical elements in promoting the usage of digital payments. According to Sariyon et al. (2020), if consumers think using a QR code mobile payment

improves their goal fulfillment and is better than using an existing payment method, they are more likely to adopt it.

Perceived compatibility was a key determinant in shaping consumers' perceptions of using QR code payments. The finding shows that the respondents agreed that QR code payments are well suited to their financial activities and lifestyles. This was supported by a relatively high level of agreement among respondents that QR code payment is easy to understand and use (Mean = 4.57), highlighting that QR code payments are intuitive and user-friendly. The finding showed that QR code payments are easy to use and understand. This finding supported Ibrahim et al. (2019), who found that the intention to use QR code payments is strongly influenced by consumers' perception of how much this system can be part of their lives or fit into them.

In addition, QR code payment is compatible with my daily financial activities (Mean = 4.42). The finding shows that consumers also use QR code payments as a way to reduce the need to carry physical cash and align with their daily financial activities. This finding supports the findings of Nazri et al. (2024), in which the intention to use digital payment is highly affected by perceived compatibility. This is because consumers usually prefer innovation that fits their daily needs well. Besides that, QR code payment fits well with my financial management (Mean = 4.16). This is further evidenced by consumers' comfort with using smartphones for QR payments (Mean = 4.44), indicating high acceptance and comfort with mobile payment technology. Consumers who perceive QR code payments as being in line with their current needs and lifestyle are likely to adopt this method (Ibrahim et al., 2019).

The second objective of this study is to identify the most significant factor that influences consumer perception (perceived security, perceived usefulness, perceived compatibility of QR code payment among adults in Dungun, Terengganu. According to the multiple regression analysis outcome, perceived compatibility ($\beta = 0.528$, $p < 0.001$) is the most significant determinant of consumer perception, followed by perceived usefulness ($\beta = 0.265$, $p < 0.001$) and perceived security ($\beta = 0.201$, $p < 0.001$). According to the results of the multiple regression analysis, Consumers in this study are more likely to accept QR code payments if they believe QR code payments will be compatible with their current banking processes. Compatibility in previous studies has a positive influence on the intention to adopt QR payment (Wan, 2024). For example, intention to use QR payments is positively related to the compatibility of QR payments and their lifestyle and other existing activities they use (Ibrahim et al., 2019).

By inference from regression analysis, these 3 factors account for 79.2% of the variance in customer perception, as indicated by a modified R² of 0.792. This means that the perception of customers on the use of QR code payment is greatly influenced by the perception of security, perceived utility, and perceived compatibility. The findings support previous research showing the importance of compatibility for the adoption of new technologies. Consumers will find QR code payments easy to incorporate into their regular banking routines (Corsini et al., 2024). The second strongest element, perceived usefulness, shows that customers' perceptions improve when they find the QR payment useful and convenient enough. At the same time, perceived security is the weakest factor, but this is significant. This means compatibility and ease are more important to be considered by the users before they adopt new technology, rather than security.

To evaluate the degree to which the independent variables are related to customer perception, a Pearson correlation analysis was conducted. The results indicate perceived security and consumer perception: $r = 0.651$ (moderate positive correlation). Following with perceived usefulness and consumer perception: $r = 0.791$ (strong positive correlation). While perceived compatibility and consumer perception: $r = 0.855$ (strong positive correlation). According to this, perceived compatibility and consumer perception are most strongly correlated, meaning that when QR payments fit well with customers' financial routines, their perspective improves significantly. Studies have shown that perceived compatibility positively affects intention towards adopting QR code payment systems (Wan, 2024). Additionally, there is a substantial association with perceived usefulness, supporting the notion that perception is influenced by QR payment efficiency. Despite having a moderate association, perceived security has a positive correlation, which supports its secondary function in influencing customer perception.

Conclusion

For entrepreneurs and users in Dungun, Terengganu, these findings highlight critical implications regarding QR code payments. Despite perceptions of security, vulnerabilities to fraud and cybersecurity risks persist. Entrepreneurs should implement real-time transaction monitoring tools to mitigate these risks. Singapore's Payment Services Act demonstrates the effectiveness of such tools, with a 22% reduction in phishing losses achieved through the identification of suspicious QR code payments, as noted by Gupta et al., (2022). Apart from that, service providers must provide QR code payment at their restaurants to encourage the use of this technology. This can encourage the widespread use of QR code payments among adults in Dungun, Terengganu.

The study's sample may not fully represent all demographic perspectives, particularly those of elderly individuals or lower-income groups with limited access to digital payment technology. Mobile-first training modules and other inclusive digital literacy initiatives are crucial, as perceived usefulness is a major driver of adoption. Malaysia's Digital Economy Corporation (2024) reports a 41% increase in QR code payment adoption among older adults in Johor in 2024. Entrepreneurs can further encourage adoption by offering cashless incentives like discounts for QR code users, which may enhance the perceived effectiveness of QR code payments among adults in Dungun, Terengganu. This study indicates that perceived compatibility strongly influences adoption, emphasizing the need to align QR code payments with existing consumer habits. Restaurants should ensure the widespread availability of QR payment methods and provide clear instructions to new users to reduce resistance.

The geographical focus on adults in Dungun, Terengganu, may not fully represent consumer perceptions across Malaysia, as different regions may exhibit varying levels of exposure, infrastructure, and perception of QR code payments. Furthermore, the exclusive use of quantitative methods limits a deeper understanding of consumer motivations, concerns, and behavioral intentions. Qualitative techniques, such as interviews or focus groups, could provide richer insights into customer impressions. Future research should extend the study to other areas in Malaysia to enhance generalizability and include additional influencing factors like trust, digital literacy, and regulatory concerns to provide a deep, comprehensive understanding. Moreover, reliance on self-reported survey responses may affect the accuracy of the results due to potential misunderstandings of the questions or social desirability bias among respondents. The study's focus on perceived security, utility, and compatibility as determinants of customer

perception omits other potential factors, such as user experience with QR payment applications, government regulations, and trust in financial institutions.

This study demonstrates that consumers' perceptions of QR code payments at restaurants are greatly influenced by perceived security, usability, and compatibility. Perceived compatibility is the most important of these elements in influencing customers' sentiments. Given that perceived compatibility is found to be the most powerful determinant of consumer perception, restaurant operators need to ensure seamless integration between the QR code payment system and bank applications or digital wallets of customers. In addition, clear instruction on how to make payments, availability of internet access and assistance of employees in case of problems with payment may also solve the problem. Besides, enhancing cybersecurity practices and showcasing certification of the providers of the payment services may resolve the issue of consumers' security concerns. Stakeholders must concentrate on increasing efficiency, fostering trust, and guaranteeing a smooth transition into customer lifestyles to increase adoption rates. QR code technology has the potential to become a widely used payment method in the restaurant business in Dungun, Terengganu, and beyond by resolving security issues and capitalizing on the ease of digital payments.

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