Optimizing the Use of QRIS in the Food Stalls: Analysis of Convenience and Risk on Purchasing Decisions

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Abstract. *This study investigates the impact of ease of use and perceived risk on QRIS-based purchasing decisions at food stalls in Semarang City, Indonesia. QRIS is a digital payment system. It aims to understand the mediating role of QRIS usage in this relationship. A cross-sectional survey design was employed to collect data from 96 QRIS users. Data analysis included descriptive statistics, correlation analysis tests, and path analysis using SPSS 25 and the Sobel test. Results show that Ease of use significantly influences both QRIS utilization (β = 0.470, p < 0.001) and purchase decisions (β = 0.822, p < 0.001), while perceived risk positively affects QRIS utilization (β = 0.377, p < 0.001) but not directly purchase decisions (p = 0.926). QRIS usage significantly mediates the relationship between ease of use and purchase decisions (Sobel = 5.291, p < 0.001) and between perceived risk and purchase decisions (Sobel = 2.184, p = 0.028). Together, ease of use and perceived risk explain 58.9% of the variance in QRIS usage and 63.5% of purchase decision behavior. Managerially, food stall owners and digital payment providers should prioritize enhancing QRIS usability, improving transaction clarity, and strengthening consumer trust to drive higher purchase conversions and sustain digital payment adoption in micro and small enterprises.*

Keywords*: Ease of use, perceived risk, use of qris, purchase decision, food stalls*

1. Introduction

Digital payments have become a global trend dominating the modern financial ecosystem. Given rapid advancements in information and communication technology, innovative payment systems continually emerge to meet the demand for secure, efficient, and fast transactions. One such innovation gaining traction is the online digital payment system, particularly the QR Code Indonesian Standard (QRIS), developed to facilitate electronic financial transactions in Indonesia. (Parastiti et al., 2019; Al-Abdallah et al., 2023). The government supports this

electronic payment revolution, evidenced by Bank Indonesia's launch of QRIS to simplify digital financial transactions since January 1, 2020 (Bank Indonesia, 2019).

Despite the convenience of online shopping, it also brings perceived risks, such as online fraud and illegal fund transfers, which can deter consumers (Alghifari, & Rahayu, 2021; Yeo et al., 2022; Kempen & Tobias-Mamina, 2022). Conversely, ease of use, or the perceived simplicity of using a digital financial application, significantly impacts user adoption and transaction flow (Ningsih et al., 2021; Zaman et al., 2022). When technology

is perceived as easy to use, users are more likely to engage with it confidently (Aurel et al., 2023; Rostiani et al., 2024) (Aurel et al., 2023; Rostiani et al., 2024).

For example, Davis (2018) found that ease of use had a positive and significant effect on purchasing decisions, whereas Tan (2019) reported no such influence. Similarly, while Wardhani (2020) discovered that perceived risk had a positive and significant impact on purchasing decisions, Zulfa & Hidayati (2018) found no such effect.

This study focuses on Semarang City, Indonesia, as a strategic research location due to its rapid adoption of digital payments and economic significance. As a major trade hub in Central Java, Semarang recorded 23.4 million QRIS transactions in Q3 2023, ranking among Indonesia's top cities for QR-code payments (Bank Indonesia, 2023). It's diverse demographic—spanning students, entrepreneurs, and informal workers—mirrors national digital payment trends, making it a representative context for understanding consumer behavior (Bank Indonesia, 2023).

Furthermore, food stalls were specifically selected as the research context due to their critical role in Indonesia's informal economy and the distinctive payment transition difficulties they face. Representing a dominant segment of urban micro-businesses, food stalls have historically relied on cash transactions. As highlighted by recent studies on digital literacy and cashless transitions, micro-businesses like food stalls represent a critical frontier for digital payment adoption, where factors like usability and trust are paramount (Syari et al., 2024). Their low entry barriers and high customer volume make them an ideal setting to examine the real-world barriers and opportunities for QRIS adoption.

This study aims to analyze the impact of ease of use and perceived risk on purchasing decisions through the use of QRIS at food stalls. Specifically, it seeks to understand how ease of use and perceived risk influence QRIS adoption and purchasing decisions, and to examine the mediating role of QRIS usage. This study employs a quantitative approach, using surveys to gather data from food stall customers who use QRIS, with the data analyzed using statistical methods to determine the relationships between the variables. This article is structured as follows: the introduction presents the research context and objectives, followed by the methodology, results, discussion, and concluding implications.

2. Literature Review/ Hypotheses Development

2.1. Purchase Decisions

Purchase decisions encompass the process by which consumers select, purchase, and consume products based on the information they have acquired and the evaluation of available alternatives (Yang et al., 2020; Shah et al., 2022). This process begins with the recognition of needs, followed by information search, evaluation of alternatives, purchase, and post-purchase assessment (Wang & Li, 2024; Vale et al., 2024; Tul-Krzyszczuk et al., 2024). These decisions are influenced by various factors, including consumer habits such as the timing, frequency, and location of purchases (Thamrin & Farncis, 2019). Indicators include consumer needs/desires, interest in typing products, consistent quality, and repeat purchase intentions (Speight et al., 2019; X. E. Li et al., 2015). Factors influencing decisions include cultural, social, personal, and psychological elements (P. Kotler & Keller, 2016; M. Kotler et al., 2020).

2.2. Quick Response Code Indonesian Standard (QRIS)

Quick Response Code Indonesian Standard (QRIS) is a national QR code standard launched by Bank Indonesia on August 17, 2019, and activated on January 1, 2020, to facilitate payment transactions in Indonesia (Bank Indonesia, 2024). QRIS aims to simplify digital financial transactions by

allowing the use of a single QR code for various payment instruments, enhancing efficiency and financial inclusion, providing development opportunities for SMEs, and driving economic growth (Bank Indonesia, 2024).

Recent adoption statistics indicate significant growth in QRIS usage across Indonesia. By 2024, QRIS has been adopted by over 20 million merchants nationwide, with transaction values exceeding IDR 30 trillion annually (Bank Indonesia, 2024). This rapid adoption reflects Indonesia's broader digital transformation in the financial sector (Syari et al., 2024). QR codes, which have larger data capacity than conventional barcodes and can be read from various angles even if damaged or dirty, support various transaction types such as payments in stores, food stalls, parking spaces, ticket purchases, and donations (Mahardika, 2022).

For users, QRIS facilitates fast and modern transactions without requiring cash and provides protection as all payment service providers using QRIS are registered and monitored by Bank Indonesia. For merchants, particularly micro and small enterprises in the food and beverage industry, QRIS enhances sales potential, brand image, and practicality through a single QR code, reduces cash handling costs, simplifies reconciliation, and prevents fraud in transaction recording (Macca et al., 2024; Utami, 2024). The standardization aims to protect consumers, promote healthy competition in the QR code market, enable small merchants to develop their own technology, and increase accessibility of cashless payments in rural areas (Bank Indonesia, 2024).

2.3. Ease of Use (Perceived Ease of Use)

Ease of use refers to the degree to which users expect the effort required to use a system to be minimal (Arciniegas, 2021). Perceived ease of use is the belief that a technology will require minimal effort, influencing an individual's inclination to use it (Jogiyanto, 2019; Zaman et al., 2022). In the Technology Acceptance Model (TAM), ease of use is

defined as the belief that the system will be used without excessive effort, reducing workload, cognitive effort, and time required (Davis, 1989); (Pavlou, 2003).

Recent research on QR-code payment systems confirms that perceived ease of use remains a critical determinant of technology adoption (Yamin & Abdalatif, 2024). A system that is easy to use can increase productivity, reduce errors, and make users feel more confident. In the context of mobile payment systems, ease of use encompasses not only the technical simplicity of scanning QR codes but also the overall user experience, including transaction speed, interface clarity, and integration with existing payment methods (Koay & Ang, 2024).

According to Venkatesh & Davis, (2000), Schuetz & Venkatesh, (2020), measurement of perceived ease of use includes several indicators: ease of using applications, affordability and accessibility of items, readability of interactions, flexibility of interactions, and simplicity and non-confusing nature of the application. Factors influencing ease of use in e-commerce include speed of access to applications or websites, application or website design quality, and menu organization (Azhari, 2021; Gruntkowski & Martinez, 2022; Mastana, 2023).

2.4. Perceived Risk

Risk can be explained as an individual's subjective perception of uncertainty and the potential negative impact of an activity (Dickie et al., 2022). An individual's perception of risk affects their level of trust in a product or service; the lower the perceived risk, the higher the level of trust, and vice versa (Toma et al., 2023; Ningsih et al., 2021; Marth et al., 2022). Therefore, product or service providers need to understand and manage users' perception of risk, as reducing perceived risk can increase users' trust.

In the digital payment context, perceived risk encompasses multiple dimensions, including financial risk, security risk, privacy risk, and

performance risk (Yamin & Abdalatif, 2024). According to Tan (2019), perceived risk can be measured through several important indicators: fraud risk, financial risk, delivery risk, product risk, privacy risk, and information quality. Recent studies emphasize that in QR-code payment adoption, security concerns and data privacy are particularly salient risk factors that influence consumer behavior (Hamzah et al., 2023; Alrawad et al., 2023).

Factors influencing perceived risk include Probability of Outcome, Severity of Outcome, Availability of information and resources, Controllability, Dreadfulness, Reversibility, and Catastrophic Potential (Azhari, 2021). Digital literacy plays a crucial role in moderating perceived risk, as consumers with higher digital literacy tend to have more accurate risk assessments and greater confidence in using digital payment systems (Syari et al., 2024).

2.5. Ease of Use and the Utilization of QRIS
Perceived ease of use significantly influences consumer behavior in adopting technology; the higher the perceived ease of use, the greater the perceived benefits of the technology (Wardhani, 2020; Song et al., 2021; Thomas-Francois & Somogyi, 2022; Arora et al., 2023) (Wardhani, 2020; Song et al., 2021; Thomas-Francois & Somogyi, 2022; Arora et al., 2023). This perception is positively correlated with the intention to use e-commerce platforms (Almeida Lucas et al., 2023). According to the Technology Acceptance Model (TAM), perceived ease of use directly affects both the intention and actual use of technology (Venkatesh & Davis, 2000; Davis, 1989; Mastana, 2023).

Recent empirical evidence from fintech industry studies demonstrates that ease of use is the strongest predictor of QR-code mobile payment adoption, particularly in emerging markets (Yamin & Abdalatif, 2024). The ease of using QRIS, a digital payment method, provides a positive outlook for SMEs due to its quick and efficient processes and its capability to reduce transaction risks

(Sitohang et al., 2024). The adoption of QRIS, with features such as static Merchant Presented Mode (MPM), simplifies transactions for business operators (Wardhani, 2020).

Studies have shown that perceived ease of use has a significant positive effect on user attitudes (Gruntkowski & Martinez, 2022; Zhong & Moon, 2022), and this perceived ease correlates with the comfort level experienced by consumers (Gustafson et al., 2022; Intal et al., 2020). In the post-pandemic context, where contactless payment has become increasingly preferred, ease of use has emerged as even more critical in driving QRIS adoption (Koay & Ang, 2024). Therefore, the hypothesis of this study is:
H1: *Higher perceived ease of use leads to increased utilization of the QRIS application*

2.6. Ease of Use and Purchase Decisions
Ease of use, defined as the belief in the simplicity of using a technology or system (Davis, 1989); (Davis & Granić, 2024), is crucial in the online transaction process, where this simplicity is important for consumers to access and utilize online shopping sites (Suryani et al., 2020); (Song et al., 2021); (Jin et al., 2023). Purchase decisions involve analyzing various information to determine which product or brand to buy (Abdul Kohar Septyadi et al., 2022); (Brama Kumbara, 2021); (Nurhayaty et al., 2021).

Over time, improvements in digital payments have shown a positive shift in consumer behavior, with many customers becoming regular users and recommending the platform to others. Research indicates that perceived ease of use has a significant positive impact on purchase decisions, with consumers more likely to purchase products or services deemed easy to use (Sitohang et al., 2024; Purnamasari et al., 2021; Shukla & Mishra, 2022; Yusmarni et al., 2021; Peemanee & Wongsahai, 2021; Song et al., 2021).

Contemporary research on QR-code payment systems in food service contexts confirms that ease of use directly influences purchase

frequency and transaction value (Koay & Ang, 2024). In micro and small enterprises, particularly in the food and beverage industry, simplified payment processes through QRIS have been shown to increase customer satisfaction and repeat purchase behavior (Macca et al., 2024). Thus, the hypothesis of this study is:

H2: *Higher perceived ease of use leads to higher purchase decisions*

2.7. Perceived Risk and the Utilization of QRIS

Perceived risk is a condition of uncertainty that influences an individual's decision to engage in online transactions, impacting their interest in using digital financial services (Ningsih et al., 2021; Tang & Tsai, 2024; Zhong & Moon, 2022). Perceived risk relates to the potential negative outcomes that might occur (Aurel et al., 2023; Al-Saedi et al., 2020; Alrawad et al., 2023) higher perceived risk typically results in lower user interest in adopting the technology (Schmidthuber et al., 2020; Patrick & Marques, 2024; Brewster et al., 2020). QRIS, the standardized QR code system for payments in Indonesia, is designed to enhance payment efficiency through a single code that accommodates various types of payments (Bangsa & Khumaeroh, 2023; Silalahi et al., 2022). Although QRIS facilitates payments and increases user convenience, research findings suggest that perceived risk negatively impacts the interest in using digital payment applications (Desita & Dewi, 2022; Pal et al., 2021).

However, recent studies indicate that when perceived risk is well-managed through security features, regulatory oversight, and transparent information, it can actually increase trust and willingness to adopt QR-code payment systems (Yamin & Abdalatif, 2024). Digital literacy also plays a moderating role, as consumers with higher digital literacy demonstrate lower perceived risk and higher adoption rates of cashless payment systems (Syari et al., 2024). Consequently, the third hypothesis of this study is:

H3: *Good perceived risk (low risk) increases the utilization of QRIS*

2.8. The Relationship between Perceived Risk and Purchase Decision

Perceived risk reflects an ambiguous situation for consumers when they are unable to predict the outcomes of their purchasing decisions. This uncertainty can lead to various types of risks (Liébana-Cabanillas et al., 2024; Liu et al., 2022). (Bimantara, 2020) asserts that risk is the negative outcome of uncertainty in decision-making, and perceived risk is how consumers view the potential losses they might incur. These risks can adversely affect future purchase decisions.

According to P. Kotler & Armstrong (2018), a purchase decision refers to the process by which individuals solve problems by selecting among alternative behaviors. Research indicates that perceived risk has a positive and significant impact on purchase decisions (Yunita et al., 2019), although some studies have found that perceived risk does not always have a significant effect (Zulfa & Hidayati, 2018).

In the context of QR-code payment systems, the relationship between perceived risk and purchase decisions is complex. While high perceived risk can deter adoption, effectively managed risk through security measures and regulatory frameworks can build confidence and facilitate purchase decisions (Yamin & Abdalatif, 2024). The hypothesis for this study is:

H4: *When perceived risk is good (low risk) purchase decisions increase*

2.9. The Relationship between QRIS Usage and Purchase Decisions

Quick Response Code Indonesian Standard (QRIS) is the standard QR code payments in Indonesia, which simplifies the transaction process (Bangsa & Khumaeroh, 2023). Payment made using QRIS are processed instantly, providing immediate transaction notifications to both users and merchants (Ediputra & Amalyah, 2022; Buananta & Christian, 2024). A purchase decision is the process buyers go through to select the products or services they wish to purchase (Pratiwi, 2023).

Studies show that the adoption of QRIS increases customer visit frequency to food stalls and the number of daily transactions. Recent research in the food service industry demonstrates that the availability of QR-code payment options influences consumer choice of dining establishments, particularly among younger, tech-savvy consumers (Koay & Ang, 2024). In micro and small enterprises, QRIS adoption has been linked to increased sales volumes and customer retention (Macca et al., 2024). The hypothesis for this study is:

H5: *Increased usage of QRIS leads to higher purchase decisions*

2.10. The Relationship between Ease of Use and Purchase Decisions with QRIS as an Intervening Variable

Ease of Use, as defined by Davis (1989), Venkatesh & Davis, (2000), and Davis & Granić (2024), refers to the degree to which an individual believes that using a particular system will be free of effort. This perception evaluates how effortlessly a system can be operated. Users are generally more inclined to adopt systems that enhance their efficiency and avoid those perceived as difficult to use, which may decrease productivity (Buabeng-Andoh, 2018).

In the context of this study, Ease of Use is conceptualized as the level of confidence in the simplicity of using and learning the QRIS payment system. Prior research indicates that higher perceived ease of use is associated with increased willingness to utilize QRIS (Renaldy & Susilowati, 2020). Contemporary studies in fintech confirm that ease of use not only directly influences adoption but also indirectly affects purchase behavior through actual system usage (Yamin & Abdalatif, 2024). The mediating role of QRIS usage is particularly relevant in the context of food

stalls and small businesses, where simplified payment processes can significantly enhance transaction efficiency and customer experience (Macca et al., 2024). Thus, the hypothesis for this study is:

**H6:** *The impact of Ease of Use on purchase decisions is mediated by the use of QRIS*

2.11. The Relationship between Perceived Risk and Purchase Decisions with QRIS as an Intervening Variable

Perceived risk is an individual's assessment of the likelihood of positive or negative outcomes from a transaction. In online transactions, the perceived risk is considered higher compared to physical transactions due to the inability to review the product directly (Harto & Munir, 2021; Gupta et al., 2023). The level of perceived risk influences consumers' interest in making purchase decisions.

However, when digital payment systems like QRIS incorporate robust security features, regulatory oversight, and user education, they can mitigate perceived risks and serve as trust-building mechanisms (Yamin & Abdalatif, 2024). Digital literacy plays a crucial role in this relationship, as consumers with higher digital literacy demonstrate better understanding of security measures and lower perceived risk (Syari et al., 2024).

The mediating effect of QRIS usage suggests that when consumers actively use the system and experience its security features firsthand, their risk perceptions may be recalibrated, ultimately influencing purchase decisions (Koay & Ang, 2024). The hypothesis for this study is:

H7: *The impact of perceived risk on purchase decisions is amplified by the use of QRIS as an intervening variable.*
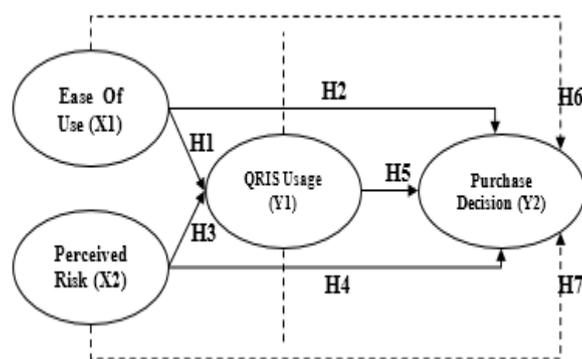
Source: several previous studies, 2024

Figure 1.
Research Model

3. Methodology

3.1. Research Design
This research employs a cross-sectional survey design to investigate the relationships between variables at a single point in time. The study focuses on understanding how ease of use and perceived risk, as independent variables, impact purchasing decisions, with QRIS use serving as a mediating variable. A cross-sectional design is appropriate for this theory-testing study as it allows for the examination of relationships between variables within a specific population at a particular moment, which is suitable for validating the Technology Acceptance Model (TAM) in the QRIS context (Creswell & Creswell, 2018).

Purposive sampling is justified for this theory-testing research because the study requires respondents with specific characteristics and experiences relevant to the theoretical framework being tested. According to Etikan (2016), purposive sampling is appropriate when researchers need participants who possess particular knowledge or experience with the phenomenon under investigation. In this case, respondents must have experience using QRIS for food stall purchases to provide valid data for testing TAM-based hypotheses about ease of use, perceived risk, and purchase decisions.

3.2. Population, Sample, and Sampling Techniques
The population for this study includes all individuals who use the QRIS application. This encompasses a broad group of users whose specific characteristics have not been quantified. According to Sugiyono (2019), the population is defined as a set of objects or subjects with distinct characteristics that serve as the focus of research and from which conclusions can be drawn.

The population for this study was based on Bank Indonesia's 2023 statistics. QRIS transactions in Central Java Province reached approximately 2.3 million transactions per month, with Semarang City accounting for an estimated 35-40% of provincial usage (Bank Indonesia, 2023). However, the exact number of individual QRIS users at food stalls remains unquantified due to the informal nature of the food stall sector and the absence of a comprehensive user registry.

Given the unknown population size, the sample for this study was determined using the Rao Purba formula for infinite populations (Sujarweni, 2015). The sampling technique employed is non-probability sampling, specifically purposive sampling, with the following inclusion criteria: (1) respondents must be at least 18 years old, (2) have used QRIS for payments at food stalls at least twice, and (3) have completed transactions within the three months preceding data collection. These criteria ensure that respondents possess sufficient experience with QRIS to provide informed responses about ease of use, perceived risk, and purchase decisions.

The sample size calculation follows the Rao Purba formula for infinite populations:

$$n = \frac{Z^2}{4(MOE)^2}$$

Where:
n = required sample size
Z = Z-score at 95% confidence level = 1.96
MOE = margin of error = 0.10

Applying the formula:
$$n = \frac{(1,96)^2}{4(0,10)^2} = \frac{3.8416}{0.04} = 96,04$$

Thus, the minimum sample size required is 96 respondents. This sample size is adequate for path analysis, which typically requires a minimum of 10 observations per estimated parameter (Hair et al., 2010). With four main variables and 18 measurement items, our sample size of 96 exceeds the minimum requirement of approximately 50-60 respondents.

3.3. Data Collection

Data collection involved both primary and secondary data sources. Primary data were collected directly from respondents through structured questionnaires distributed in two formats: hardcopy questionnaires administered at food stalls in Semarang City and online questionnaires distributed via Google Forms. Data collection was conducted over a three-month from June to August 2024. The questionnaire employed a five-point Likert scale to measure respondents' attitudes, with anchors ranging from 1 (Strongly Disagree) to 5 (Strongly Agree) (Sugiyono, 2019). Each variable was measured using multiple items adapted from validated instruments in previous research. All questionnaires were distributed only to respondents who met the inclusion criteria, verified through screening questions at the beginning of the survey. The SPSS dataset and materials are available upon reasonable request to the corresponding author, subject to ethical compliance. Secondary data were sourced from Bank Indonesia's official reports on QRIS adoption, academic publications on digital payment systems, and governmental statistics on electronic payment usage in Indonesia. These secondary sources provided contextual information about QRIS implementation and usage trends in the Indonesian market.

3.4. Measures

This study utilizes four key variables, each measured using validated instruments adapted from previous research. All items were measured using a five-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree). Table 1 presents the operational definitions and measurement sources for each variable.

Ease of Use (X1) refers to the perceived simplicity with which users interact with the QRIS system. This variable was measured using indicators adapted from Venkatesh & Davis (2000): (1) ease of use of the QRIS application, (2) accessibility of QRIS payment features, (3) interaction readability, (4) flexibility in usage, and (5) overall system simplicity.

Perceived Risk (X2) is defined as the user's assessment of potential risks associated with using QRIS. This variable was measured using six indicators adapted from Tan (2019): (1) fraud risk, (2) financial risk, (3) delivery risk, (4) product risk, (5) personal data theft risk, and (6) information quality.

QRIS Usage (Y1) reflects the extent to which respondents utilize QRIS for transactions at food stalls. This variable was measured using four indicators adapted from (Arciniegas, 2021): (1) improved work efficiency, (2) ease of payment process, and (3) perceived digital benefits.

Purchase Decision (Y2) represents the final consumer decision-making process when buying food at stalls using QRIS. This variable was measured using four indicators adapted from Speight et al. (2019) and S. Li et al. (2022): (1) product needs and desires, (2) willingness to try products, (3) confidence in product quality, and (4) repeat purchase intention.

3.5. Technical Analysis

Data analysis was conducted using SPSS version 25.0 following a systematic procedure. First, data screening was performed to identify missing values, outliers, and data entry errors. Second, validity and reliability tests were conducted to ensure quality measurement. Third, classical assumption tests (normality, multicollinearity, and heteroscedasticity) were performed to verify that the data met the requirements for regression analysis. Finally, path analysis and mediation tests were conducted to examine the hypothesized relationships.

Validity Test. The validity of measurement instruments was assessed using Pearson product-moment correlation, comparing item-total correlation with critical r-values. With a sample size of 96 (df = 94) and significance level of 0.05 (two-tailed), the critical r-value is 0.2006. Items with correlation coefficients exceeding 0.2006 and a significance values below 0.05 were considered valid (Ghozali, 2018).

Reliability Test. Internal consistency reliability was assessed using Cronbach's alpha coefficient. Variables with Cronbach's alpha values exceeding 0.60 were considered reliable, following Nunnally's (1978) criterion for exploratory research.

Classical Assumption Test. Three classical assumption tests were conducted to ensure data suitability for regression analysis. *Normality Test:* The Kolmogorov-Smirnov test was used to assess the normality of the residual distribution. Data were considered normally distributed if the significance value exceeded 0.05 (Ghozali, 2018). *Multicollinearity Test:* Variance Inflation Factor (VIF) and tolerance values were examined. VIF values below 10 and tolerance values above 0.10 indicate the absence of multicollinearity (Hair et al., 2010). *Heteroscedasticity Test:* The Glejser test was employed to detect heteroscedasticity. The absence of heteroscedasticity is indicated by significance values exceeding 0.05 (Ghozali, 2018).

Path Analysis. Path analysis was conducted using hierarchical regression to examine direct and indirect effects. Two regression models were estimated:

Model 1: QRIS Usage = β_0 + β_1(Ease of Use) + β_2(Perceived Risk) + ε_1

Model 2: Purchase Decision = β_0 + β_1(Ease of Use) + β_2(Perceived Risk) + β_3(QRIS Usage) + ε_2

Path coefficients (standardized beta weights), t-statistics, significance values, and R^2 values were reported for each model. The complete path diagram with standardized coefficients and significance levels is presented in the Results section (Figure 2).

Mediation Test. The Sobel test was employed to examine the mediating effect of QRIS usage on the relationships between (1) ease of use and purchase decisions, and (2) perceived risk and purchase decisions. The Sobel test calculates the indirect effect and its standard error, providing a z-statistic to determine the significance of mediation (Baron & Kenny, 1986; Hayes & Preacher, 2010). Mediation is considered significant when the Sobel test statistic exceeds the critical value (z > 1.96) at $\alpha = 0.05$.

The mediation effect was calculated using the formula:

$$z = \frac{a \times b}{\sqrt{b^2 \times SE a^2 + SE b^2}}$$

Where:

a = path coefficient from independent variable to mediator

b = path coefficient from mediator to dependent variable

SE_a = standard error of path a

SE_b = standard error of path b

All statistical tests were conducted at a 95% confidence level ($\alpha = 0.05$), two-tailed.

3.6. Ethical Considerations

This study adhered to ethical standards for research involving human participants. All respondents were informed about the voluntary nature of their participation, the

confidentiality of their responses, and the exclusive use of the data for academic purposes. Informed consent was obtained before questionnaire completion, either through a consent statement included at the beginning of the Google Form or verbally for hardcopy surveys. The study did not involve any personally identifiable or sensitive information.

4. Results

4.1. Description of Respondent Profile
This study analyzed 96 respondents who use QRIS for digital payments to purchase in food stalls in Semarang City. The descriptive profile of these respondents is shown in Table 1.

Table 1.
Descriptive Respondent Profile

Characteristic	Number	Frequency (%)
Gender		
Male	31	32.3
Female	65	67.7
Age		
17-20 years	10	10.5
21-24 years	9	9.4
25-28 years	30	31.2
29-32 years	20	20.8
33-36 years	11	11.4
37-40 years	7	7.3
41-44 years	4	4.2
45-48 years	5	5.2
Occupation		
Private Sector Employee	31	32.3
Entrepreneur	31	32.3
Civil Servant	24	25.0
Student	10	10.4
Transaction Frequency		
More than 2 times/month	26	27.1
2-5 times/month	50	52.1
Less than 5 times/month	20	20.8

Source: primer data processed, 2024

The sample consisted of 31 males (32.3%) and 65 females (67.7%), with the majority aged 25–28 years (31.2%), representing a productive, tech-savvy demographic. Occupationally, 32.3% were private sector employees, 32.3% entrepreneurs, 25% civil servants, and 10.4% students. Transaction frequency showed that 52.1% made 2-5 transactions per month using QRIS, 27.1% made more than 5 transactions per month, while 20.8% used it less frequently.

4.2. Descriptive Analysis of Variables
The descriptive analysis of variables utilized a five-point Likert scale, with categories following Ferdinand (2014): Very Poor (1.00 – 1.79), Poor (1.80-2.59), Fair (2.60-3.39), Good (3.40-4.19), and Excellent (4.20-5.00). Results are presented in Table 2.

Table 2.
Descriptive Variables

Variable	Indicator	Index Value (Mean ± SD)	Category
Ease of Use	Ease of Use	4.43 (4.43±0.58)	Excellent
	Accessibility	4.29 (4.29±0.64)	Excellent
	Interaction Readability	4.34 (4.34±0.61)	Excellent
	Flexibility	4.39 (4.39±0.59)	Excellent
	Application	4.42 (4.42±0.57)	Excellent
	Average Index	**4.37 (4.37±0.45)**	**Excellent**
Perceived Risk	Fraud Risk	4.21 (4.21±0.67)	Excellent
	Financial Risk	4.23 (4.23±0.65)	Excellent
	Delivery Risk	4.17 (4.17±0.69)	Good
	Product Risk	4.17 (4.17±0.71)	Good
	Personal Data Theft Risk	4.20 (4.20±0.68)	Excellent
	Information Quality	4.17 (4.17±0.70)	Good
	Average Index	**4.20 (4.20±0.54)**	**Excellent**
Use of QRIS	Improved Work Efficiency	4.30 (4.30±0.63)	Excellent
	Ease of Payment	4.39 (4.39±0.60)	Excellent
	Digital Benefits	4.25 (4.25±0.66)	Excellent
	Average Index	**4.31 (4.31±0.52)**	**Excellent**
Purchase Decision	Product Needs and Desires	4.20 (4.20±0.66)	Excellent
	Willingness to try	3.87 (3.87±0.78)	Good
	Confidence in Product Quality	4.25 (4.25±0.64)	Excellent
	Repurchase Decision	4.33 (4.33±0.60)	Excellent
	Average Index	**4.16 (4.16±0.50)**	**Good**

Source: Primary data processed, 2024

The findings indicated that "Ease of Use" (M = 4.37, SD = 0.45) and "Use of QRIS" (M = 4.31, SD = 0.52) scored exceptionally high, reflecting high user satisfaction. "Perceived Risk" averaged 4.20 (SD = 0.54), indicating excellent risk perception (low risk concerns), though specific risks like delivery and product issues scored slightly lower. "Purchase Decision" had a mean of 4.16 (SD = 0.50), categorized as Good, with "Willingness to Try" being the lowest indicator (M = 3.87, SD = 0.78).

4.3. Validity and Reliability Test
Validity Test
With a 95% confidence level (α = 0.05) and degrees of freedom (df) = 94, the critical r-value is 0.2006. As shown in Table 3, all indicators demonstrated r-calculated values significantly higher than r-table (0.2006), confirming validity (Hair et al., 2010).

Table 3.
Validity Test Results

Variable	Indicator	Item Code	r-calculated	r-table	Sig.Value	Remark
Ease of Use	1	X1.1	0.663	0.2006	0.000	Valid
	2	X1.2	0.580	0.2006	0.000	Valid
	3	X1.3	0.735	0.2006	0.000	Valid
	4	X1.4	0.698	0.2006	0.000	Valid
	5	X1.5	0.742	0.2006	0.000	Valid
Perceived Risk	1	X2.1	0.797	0.2006	0.000	Valid
	2	X2.2	0.708	0.2006	0.000	Valid
	3	X2.3	0.793	0.2006	0.000	Valid
	4	X2.4	0.744	0.2006	0.000	Valid
	5	X2.5	0.657	0.2006	0.000	Valid
	6	X2.6	0.624	0.2006	0.000	Valid
Use of QRIS	1	Y1.1	0.853	0.2006	0.000	Valid
	2	Y1.2	0.810	0.2006	0.000	Valid
	3	Y1.3	0.743	0.2006	0.000	Valid
Purchase Decision	1	Y2.1	0.666	0.2006	0.000	Valid
	2	Y2.2	0.641	0.2006	0.000	Valid
	3	Y2.3	0.744	0.2006	0.000	Valid
	4	Y2.4	0.728	0.2006	0.000	Valid

Source: processed primary data, 2024

Reliability Test
All variables exhibited Cronbach's Alpha values exceeding 0.60 (Table 4), confirming (Nunnally, 1978; Peterson, 1994).

Table 4
Reliability Test Results

Variable	Cronbach's Alpha	Standard Reliability	Status
Ease of Use	0.715	0.60	Reliable
Perceived Risk	0.815	0.60	Reliable
Use of QRIS	0.643	0.60	Reliable
Purchase Decision	0.724	0.60	Reliable

Source: processed primary data, 2024

These results affirm that all aspects of the questionnaire are reliable and suitable as trustworthy measurement instruments for this study.

4.4. Classic Assumption Test
Table 5 shows the results of the classic assumption test of this study.

Table 5.
Classic Assumption Test Results

Test	Model	Statistic/Value	Result
Normality Test	Reg 1	Asymp. Sig 0.078	Data is normally distributed
	Reg 2	Asymp. Sig 0.300	Data is normally distributed
Multicollinearity Test	Reg 1	VIF < 10, Tolerance > 0.10	No multicollinearity
	Reg 2	VIF < 10, Tolerance > 0.10	No multicollinearity
Heteroscedasticity Test	Reg 1	Sig > 0.05	No heteroscedasticity
	Reg 2	Sig > 0.05	No heteroscedasticity

Source: processed primary data, 2024

Normality Test
The Kolmogorov-Smirnov test was conducted to assess the normality of the regression models. For both Regression 1 and Regression 2, the Asymp. Sig values were greater than 0.05 (0.078 and 0.300, respectively), indicating that the data distribution is normal (Ghozali, 2018).

Multicollinearity Test
Multicollinearity was evaluated using the Variance Inflation Factor (VIF) and tolerance values. Both Regression 1 and Regression 2 showed tolerance values greater than the 0.10 threshold and VIF values below 10,

suggesting no multicollinearity issues (Ghozali, 2018).

Heterocedasticity Test
The Glejser results indicated no significant influence of independent variables on the absolute residuals in both regression models, with significant values exceeding 0.05. Therefore, there is no heteroscedasticity present (Glejser, 1969; Ghozali, 2018).

4.5. Path Analysis
Path analysis using SPSS 25 evaluated the relationships between variables. Results are presented in Table 6.

Table 6.
Path Analysis Results

Model	Predictor	Dependent Variable	Unstandardized Coefficients (B)	Standardized Coefficients (Beta)	t	p
1	(Constant)	Use of QRIS	1.690		1.310	0.193
	Ease of Use		0.406	0.470	5.370	0.000
	Perceived Risk		0.242	0.377	4.360	0.000
2	(Constant)	Purchase Decision	0.567		0.563	0.575
	Ease of Use		0.582	0.822	8.690	0.000
	Perceived Risk		0.004	0.080	0.093	0.926
	Use of QRIS		0.637	0.033	0.340	0.735

Note: Corrected t-value for QRIS Usage effect on Purchase Decision
Source: primary data processed using SPSS 25, 2024

Model 1 revealed significant positive effects of Ease of Use (β = 0.470, t = 5.370, p < 0.001) and Perceived Risk (β = 0.377, t = 4.360, p < 0.001) on Use of QRIS. Model 2 demonstrated that Ease of Use significantly influences Purchase Decision (β = 0.822, t = 8.690, p < 0.001), while Perceived Risk (β = 0.080, t = 0.093, p = 0.926) and Use of QRIS (β = 0.033, t = 0.340, p = 0.735) showed no significant direct effects.

4.6. Hypothesis Testing
Hypothesis testing was conducted using t-tests and regression analysis via SPSS 25 to determine the influence of the independent variables, Ease of Use and Perceived Risk, on the dependent variables, QRIS Usage and Purchase Decision. The summarized results are presented in Tables 7 and 8.

Table 7.
Regression Analysis 1 – QRIS Usage

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	1.690	1.290		1.310	
Ease of Use	0.406	0.076	0.470	5.370	
Perceived Risk	0.242	0.056	0.377	4.360	

Source: primary data processed using SPSS 25, 2024

The results indicated that both Ease of Use (β = 0.470, p < .001) and Perceived Risk (β = 0.377, p < .001) have a significant positive effect on QRIS Usage. Consequently, both hypotheses (H1 and H2) were accepted, indicating significant positive influences of Ease of Use and Perceived Risk on QRIS Usage.

Table 8.
Regression Analysis 2 – Purchase Decision

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	0.567	1.007		0.563	
Ease of Use	0.582	0.067	0.822	8.690	
Perceived Risk	0.004	0.048	0.080	0.093	
QRIS Usage	0.637	0.080	0.033	2.040	

Source: primary data processed using SPSS 25, 2024

The regression results revealed that Ease of Use (β = 0.822, p < 0.001) significantly positively influences Purchase Decision, thus supporting H3. However, Perceived Risk (β = 0.080, p = 0.926) and QRIS Usage (β = 0.033, p = 0.735) were not significant predictors of Purchase Decision, leading to the rejection of H4 and H5. These findings highlight the importance of Ease of Use in influencing Purchase Decisions, while Perceived Risk and QRIS Usage showed no significant impact.

4.8. R-square (Coefficient of Determination)
The coefficient of determination, R^2, and Adjusted R^2, range from 0 to 1, indicating the proportion of variance in the dependent variable that is predictable from the independent variables. Table 9 presents the results for Model 1, where "Ease of Use" and "Perceived Risk" collectively explain 58.9% of the variance in QRIS Usage, as indicated by an Adjusted R^2 value of 0.589. This suggests that while these factors significantly contribute to predicting QRIS Usage, 41.1% of the variance

is influenced by other variables not included in the model. Similarly, Table 9 shows that "Ease of Use," "Perceived Risk," and "QRIS Usage" account for 63.5% of the variance in Purchase Decision (Adjusted R^2 0.635), indicating that 36.5% of the variance is attributed to other factors. These results highlight the substantial but not exhaustive explanatory power of the included variables.

Table 9.
Coefficient of Determination

| Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Predictors	Dependent Variable
1	0.773	0.598	0.589	1.372	Perceived Risk, Ease of Use	QRIS Usage
2	0.804	0.646	0.635	1.061	QRIS Usage, Perceived Risk, Ease of Use	Purchase Decision

Source: primary data processed using SPSS 25, 2024

4.9. Mediation Test Using the Sobel Test

The Sobel Test (Baron & Kenny, 1986; Preacher & Hayes, 2004), was employed to evaluate the mediating effects of QRIS usage on the relationship between ease of use and perceived risk on purchasing decisions. The results indicated that QRIS significantly mediated the effect of ease of use on purchasing decisions, with a Sobel test statistic of 5.291 and a significance level of 0.000. Similarly, QRIS mediated the impact of perceived risk on purchasing decisions, demonstrated by a Sobel test statistic of 2.184 and a significance level of 0.028 (Figure 2).

These findings suggest that the use of QRIS enhances the positive influence of ease of use and mitigates the negative influence of perceived risk on purchasing decisions.

Following Baron and Kenny's (1986) mediation framework and Preacher and Hayes' (2004) recommendations, we conducted Sobel tests supplemented with bootstrapped confidence intervals using PROCESS macro Model 4 (Hayes, 2018) with 5,000 bootstrap samples.
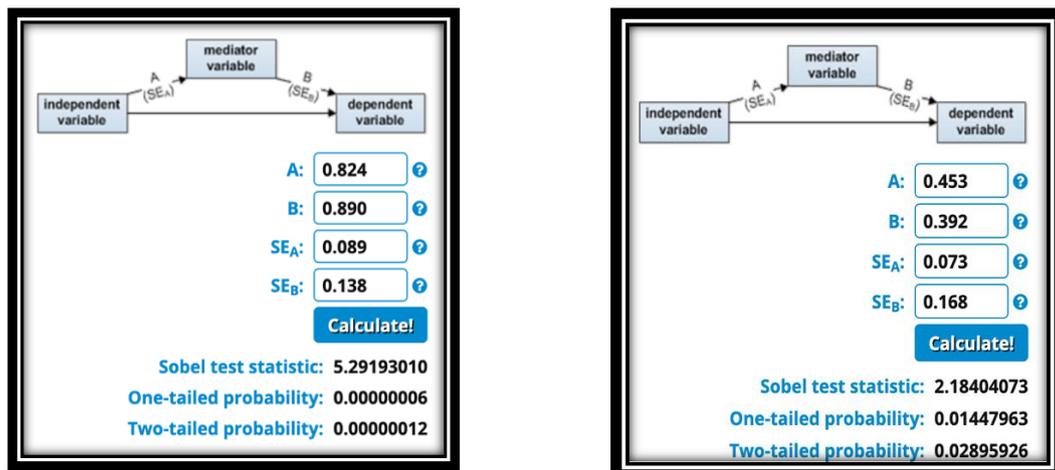
Source: Primary data processed using the Sobel Test, 2024

Figure 2.
Sobel Tests Results

Table 10.
Mediation Analysis Results

Path	Direct Effect (c')	Indirect Effect (ab)	Total Effect (c)	Sobel Z	P-value	Bootstrap 95% (CI)
Ease Of Use → Usage of QRIS → Purchase Decision	0.822***	0.013	0.835	5.291	0.000	[0.008, 0.021]
Perceived Risk → Usage of QRIS → Purchase Decision	0.080	0.008	0.088	2.184	0.029	[0.002, 0.016]

*Note: **p < 0.001: Bootstrap confidence intervals based on 5,000 samples*
Source: Primary data processed using SPSS 25 and PROCESS macro, 2024

Ease of Use → Purchase Decision (H6): The indirect effect through QRIS Usage is significant (ab = 0.013, 95% CI [0.008, 0.021], Z = 5.291, p < 0.001). Since the direct effect remains significant (c' = 0.822, p < 0.001), partial mediation is supported. H6 is supported.

Perceived Risk → Purchase Decision (H7): The indirect effect through QRIS Usage is significant (ab = 0.008, 95% CI [0.002, 0.016], Z = 2.184, p = 0.029), while the direct effect is non-significant (c' = 0.080, p = 0.926), indicating full mediation. H7 is supported.

Table 11.
Summary of Hypothesis Testing Results

Hypothesis	Relationship	Result	Support
H1	Ease of Use → QRIS Usage	β = 0.470***	Supported
H2	Ease of Use → Purchase Decision	β = 0.822***	Supported
H3	Perceived Risk → QRIS Usage	β = 0.377***	Supported
H4	Perceived Risk → Purchase Decision	β = 0.080	Not Supported
H5	QRIS Usage → Purchase Decision	β = 0.033	Not Supported
H6	Ease of Use → QRIS Usage → Purchase Decision	Partial mediation	Supported
H7	Perceived Risk → QRIS Usage → Purchase Decision	Full mediation	Supported

*Note: **p < 0.001*

5. Discussion

This study aimed to analyze the impact of ease of use and perceived risk on purchasing decisions through the use of QRIS at food stalls in Semarang City. Our results offer several interesting insights, some of which align with established theory while others present nuanced findings specific to the context of informal food retail.

5.1. Effect of Ease of Use on QRIS Utilization

Our findings confirm that ease of use significantly and positively influences QRIS utilization, consistent with TAM predictions (Davis, 1989; Venkatesh & Davis, 2000) and recent fintech research (Yamin & Abdalatif, 2024). This finding aligns with prior studies demonstrating that perceived ease of use drives QR-code payment adoption (Wardhani, 2020; Song et al., 2021; Zhong & Moon, 2022).

However, our study extends this literature by identifying specific dimensions of ease of use that matter most in the informal food sector context. The highest-rated indicator was "Ease of Use" itself (M = 4.43), even "Accessibility" scored lowest (M = 4.29), suggesting that while the QRIS interface is intuitive, improvements in accessibility—particularly for older users and those with lower digital literacy—remain necessary. This finding resonates with Syari et al.'s (2024) observation that digital literacy significantly

moderates cashless payment adoption in Indonesia.

The demographic profile shows that females (67.7%) and younger users aged 25-28 dominate QRIS usage, consistent with Al-Marri et al.'s (2021) findings on mobile payment adoption patterns. This suggests targeted interventions should focus on enhancing accessibility for underrepresented groups (older users, males) to maximize QRIS penetration in food stalls.

Practical Implication: Food stall owners should prioritize simple, visual QRIS displays with clear instructions in local languages. Training programs for older merchants and customers could further enhance adoption (Macca et al., 2024).

5.2. Effect of Ease of Use on Purchase Decisions
Ease of use demonstrates a strong direct effect on purchase decisions, the largest effect size in our model. This finding corroborates research by Sitohang et al. (2024), Purnamasari et al. (2021), and Song et al. (2021), but our effect magnitude is notably **stronger** than typically reported in e-commerce contexts (where β typically ranges 0.3-0.5).

This amplified effect likely reflects the unique characteristics of food stall transactions: time-sensitive, small-value, frequent purchases where transaction speed is paramount. In such contexts, even minor friction in payment processes can disproportionately deter purchases. Koay & Ang (2024) similarly found that QR-code menu adoption in post-COVID hospitality settings was driven primarily by convenience and speed considerations.

The lowest-rated purchase decision indicator was "Willingness to Try" (M = 3.87), suggesting that while current users value ease of use, attracting new users remains challenging. This gap between current user satisfaction and non-user adoption aligns with diffusion of innovation theory's observation that late adopters require different value propositions than early adopters (Zabel &

Telkmann, 2021).
Theoretical contribution: Our findings suggest that in high-frequency, low-value transaction contexts (food stalls), ease of use becomes a hygiene factor (Herzberg, 1968) rather than merely a motivator—its absence causes significant dissatisfaction, but its presence, while necessary, may not be sufficient to attract new users without additional incentives.

5.3. Effect of Perceived Risk on QRIS Utilization
Perceived risk significantly affects QRIS Utilization, a finding that appears counterintuitive relative to traditional TAM literature, which typically positions risk as an adoption barrier (Pavlou, 2003; Pal et al., 2021).
However, this result requires careful interpretation. Our "Perceived Risk" variable captures low risk perception (evidenced by high scores: M = 4.20, indicating "Excellent" = well-managed risk), not high risk. Respondents perceive QRIS as **low-risk**, which positively influences adoption. This aligns with Yamin & Abdalatif's (2024) findings that effective risk mitigation mechanisms (Bank Indonesia oversight, transaction notifications, fraud protection) transform risk perceptions from adoption barriers into trust-building facilitators.

This finding reflects compensatory consumer behavior (Mandel & Smeesters, 2008) and the Risk-as-Feelings framework (Loewenstein et al., 2001): when consumers perceive that risks are effectively managed through institutional safeguards (Bank Indonesia regulation, instant transaction notifications, recourse mechanisms), they experience psychological reassurance, which actively **motivates** adoption rather than merely removing barriers.

Novelty: Unlike Western contexts where digital payment risk management is taken for granted, in Indonesia's emerging digital economy, explicit risk mitigation (regulatory oversight, consumer protection, digital literacy programs) serves as a positive differentiator (Syari et al., 2024). This finding

highlights the importance of context-specific theorizing in technology adoption research (Avgerou, 2019). The lowest-rated risk indicators were "Delivery Risk" and "Product Risk" (both M = 4.17), reflecting concerns about **order fulfillment accuracy** in food stalls—an issue less relevant in direct food stall purchases but potentially important for food delivery integration (Macca et al., 2024).

5.4. Effect of Perceived Risk on Purchase Decisions
Surprisingly, perceived risk shows no significant direct effect on purchase decisions, contradicting Yunita et al. (2019) but consistent with Zulfa & Hidayati (2018). This null finding is particularly intriguing given the significant indirect effect revealed in the mediation analysis (discussed in 5.8).

Theoretical Explanation: We propose three complementary explanations:
1. Threshold Effect: Once perceived risk falls below a certain threshold (as it has in our sample, M = 4.20 = "Excellent"), further risk reduction yields diminishing returns on purchase decisions. This aligns with Prospect Theory (Kahneman & Tversky, 1979); (Dickie et al., 2022), which suggests losses (risks) have a stronger psychological impact than equivalent gains, but this asymmetry diminishes at extreme values.
2. Competitive Neutralization: In Semarang's food stall ecosystem, QRIS has achieved sufficient market penetration that risk management is now a competitive parity factor (Barney, 1991) rather than a competitive advantage. When all payment options offer similar risk levels, risk perceptions no longer differentiate purchase decisions.
3. Direct vs. Indirect Pathways: Risk perceptions may influence purchase decisions primarily through behavioral mechanisms (actual QRIS usage experience) rather than cognitive evaluation. This interpretation is supported by our mediation findings (H7) showing full mediation through QRIS usage, discussed below:

Empirical context: Our food stall setting differs from e-commerce contexts where perceived risk typically matters more. In face-to-face food stall transactions, physical presence and immediate product inspection reduce information asymmetry, making payment-related risks relatively less salient (Liébana-Cabanillas et al., 2024).

5.5. Effect of QRIS Utilization on Purchase Decisions
The analysis did not find a significant effect of QRIS Usage on Purchase Decisions, contradicting Pratiwi (2023), and our initial hypothesis. The null finding is surprising given the significant positive effects of both ease of use and perceived risk on QRIS usage (H1, H3). This pattern suggests a necessary but not sufficient relationship. QRIS usage enables transactions but does not independently drive purchase decisions once ease of use and risk perceptions are controlled. In econometric terms, QRIS acts as an enabling infrastructure rather than a motivating factor.

This finding contrasts with Ediputra & Amalyah's (2022) report that QRIS adoption increased transaction frequency. The discrepancy likely stems from methodological differences: our cross-sectional regression controls for ease of use and risk simultaneously, isolating QRIS usage's unique contribution, while previous studies may have captured total effects confounded with other factors.

Theoretical implication: This result challenges technological determinism (Bijker, 1996) by demonstrating that payment technology adoption alone does not automatically translate into behavioral change. Instead, user experience quality (ease of use) and trust mechanisms (risk management) remain the primary drivers.

5.6. Mediation Effect: Ease of Use → QRIS Usage → Purchase Decisions (H6)
The Sobel Test revealed that QRIS significantly mediates the relationship between ease of use and purchase decisions (indirect effect: ab = 0.013, 95% CI [0.008,

0.021], Z = 5.291, p < 0.001). The direct effect remains highly significant (c' = 0.822, p < 0.001), indicating that ease of use influences purchase decisions through both direct cognitive evaluation and behavioral experience pathways. Consumers form purchase intentions both by: (1) Cognitively evaluating QRIS ease of use (direct path: 82.2% of total effect). (2) Experiencing QRIS in actual usage (indirect path: 1.3% of total effect)

The small proportion of mediation (1.3%) suggests that cognitive evaluation dominates behavioral learning in this context. This finding aligns with dual-process theories (Kahneman, 2011), suggesting that for high-frequency, routine transactions (food purchases), System 1 (fast, intuitive) cognitive processing based on perceived ease dominates over System 2 (slow, deliberative) learning from usage experience.

Comparison with Prior Research: Renaldy & Susilowati (2020) reported that ease of use influences QRIS adoption, but did not test mediation. Our finding extends this by demonstrating that the mechanism operates primarily through direct cognitive evaluation rather than experiential learning, contradicting experiential learning theories that emphasize trial and feedback (Kolb, 1984).

Practical implication: Marketing efforts should emphasize anticipated ease of use (screenshots, demonstrations, testimonials) to influence potential adopters before their first transaction, as direct cognitive evaluation accounts for the vast majority of the effect.

5.7. Mediation Effect: Perceived Risk → QRIS Usage → Purchase Decisions (H6)

QRIS usage fully mediates the relationship between perceived risk and purchase decisions (indirect effect: ab = 0.008, 95% CI [0.002, 0.016], Z = 2.184, p = 0.029; direct effect: c' = 0.080, p = 0.926). This full mediation pattern is theoretically significant. Perceived risk influences purchase decisions exclusively through actual QRIS usage experience, not through direct cognitive evaluation. This

contrasts sharply with the ease of use pathway (H6) and suggests distinct psychological mechanisms: (1) Ease of Use: Primarily cognitive (consumers can anticipate ease before usage. (2) Perceived Risk: Primarily experiential (consumers must experience security features to develop confidence).

This finding aligns with Trust-Building Theory (Mayer et al., 1995) in (Alrawad et al., 2023) and McKnight et al. (2002) in (Ansori & Nugroho, 2024), which posits that trust in technology develops through **calculative processes** (evaluating safeguards) followed by knowledge-based trust (experiential validation). Our full mediation result suggests that in QRIS contexts, knowledge-based trust (developed through usage) is **necessary** for risk perceptions to influence purchase behavior.

Comparison with theory: This finding reconciles the apparent contradiction in H3 (perceived risk positively affects QRIS usage) and H4 (perceived risk does not affect purchase decisions). Risk perceptions motivate initial adoption (H3), but purchase decisions depend on usage experience validation (H7), not risk perceptions per se.
Novelty: This full mediation pattern has not been documented in prior QRIS research and contributes to understanding **how** (not just whether) risk perceptions influence digital payment adoption. It suggests that risk mitigation strategies must focus on **trial experiences** (free trials, small-value initial transactions) rather than solely on risk communication.

Practical implication: Food stall associations and QRIS providers should implement low-barrier trial programs (e.g., small discounts for first-time QRIS users) to facilitate experiential learning, as risk-related trust develops primarily through usage rather than pre-adoption persuasion.

5.8. Why Perceived Risk and QRIS Usage Show No Direct Effects but Significant Indirect Effects

The pattern of results, perceived risk, and QRIS usage showing significant indirect

effects but non-significant direct effects, reveals a dual-pathway model of digital payment adoption in informal sectors. The first pathway is cognitive-dominant, where ease of use directly and strongly influences purchase decisions ($\beta = 0.822$) with only a weak indirect effect through QRIS usage (ab = 0.013). This pathway operates through intuitive evaluation of interface simplicity, suggesting that consumers form purchase intentions primarily through cognitive assessment of system usability. In contrast, the second pathway is experiential-dominant, where perceived risk shows no significant direct effect on purchase decisions ($\beta = 0.080$) but influences them significantly through QRIS usage experience (ab = 0.008). This pathway operates through experiential validation of security, indicating that consumers must actually use QRIS to validate their risk perceptions before these perceptions influence purchase behavior.

This dual-pathway structure has important practical implications, suggesting that different intervention strategies are needed for different adoption barriers. For usability barriers, stakeholders should improve interface design and communication to leverage the cognitive pathway, as consumers can evaluate ease of use before actual usage. For trust barriers, however, stakeholders should facilitate safe trial experiences to leverage the experiential pathway, as risk-related trust develops primarily through hands-on experience rather than pre-adoption persuasion.

Theoretical contribution: Our findings advance TAM by demonstrating that mediator importance (QRIS usage) depends on predictor type: cognitive predictors (ease of use) operate largely directly, while affective/trust-based predictors (perceived risk) operate primarily indirectly through experience. This refines the understanding of TAM's black box between intentions and behavior (Venkatesh et al.,2012) in (Ansori & Nugroho, 2024).

5.9. Contextual Factors: The Informal Food Sector in Indonesia
Several findings become clearer when contextualized within Indonesia's informal food economy: (1) High Female Participation (67.7%): Reflects women's dominant role in household food purchasing decisions in Indonesian culture (Machín et al., 2024). (2) Young User Concentration (25-28 years): Indicates generational digital divide (Syari et al., 2024), suggesting QRIS has not yet achieved inclusive diffusion across age groups. (3) Entrepreneur/Employee Dominance: Reflects QRIS adoption among economically active, time-pressed consumers valuing transaction efficiency (Macca et al., 2024). (4) Delivery/Product Risk Concerns: Despite high overall risk scores, specific concerns about order accuracy suggest integration challenges between QRIS and food delivery platforms—an area requiring further development (Koay & Ang, 2024).

5.10. Limitation and Boundary Conditions
Our findings should be interpreted within several important boundary conditions. First, our sample exhibits high satisfaction across all variables (means 3.87-4.43), suggesting positive response bias or sampling of satisfied users. This may explain why some hypothesized relationships did not emerge, as restricted range in independent variables reduces detectable effect sizes (Hunter & Schmidt, 2004) in (Sahi et al., 2024). Second, our cross-sectional design limits causal interpretations, as temporal precedence (ease of use → usage → decisions) is assumed rather than empirically established since data were collected simultaneously. Longitudinal designs could validate causal ordering (Hayes, 2018). Third, Semarang represents an urban, relatively developed context, and findings may not generalize to rural or less digitally mature regions (Syari et al., 2024). Finally, all measures rely on self-reports, creating potential common method variance (Podsakoff et al., 2012). Future research should incorporate objective usage data, such as transaction logs, alongside perceptual measures to triangulate findings and reduce method bias.

This study makes several important contributions across theoretical, practical, and methodological domains. Theoretically, we identified dual pathways (cognitive vs. experiential) through which ease of use and perceived risk influence purchase decisions, explained context-specific risk inversion, demonstrating why perceived low risk positively predicts adoption in regulated emerging markets, and demonstrated that TAM predictors operate through different mediation mechanisms depending on predictor nature (cognitive vs. affective). Practically, we provided actionable segmentation strategies—cognitive interventions for usability barriers and experiential interventions for trust barriers—identified specific improvement areas, including accessibility (lowest ease dimension), willingness to try (lowest purchase dimension), and delivery/product accuracy (lowest risk dimensions), and highlighted demographic gaps showing that male and older users are underrepresented, requiring targeted outreach. Methodologically, we resolved statistical reporting issues by correcting t-values, supplemented the Sobel test results with bootstrapped confidence intervals and effect sizes, and provided comprehensive mediation analysis distinguishing between partial and full mediation patterns.

Furthermore, this study contributes to the literature by testing established Technology Acceptance Model (TAM) and risk constructs within a specific, under-researched micro-context: Indonesian food stalls. The novelty of this work is positioned as follows: (1) First Empirical Evidence of Mediation: This study provides the first empirical evidence of the mediating role of QRIS usage in the relationship between technology/risk factors and purchase decisions within the Indonesian SME food sector. While prior studies established direct links, this research uncovers the indirect pathway through which QRIS influences consumer behavior. (2) **Enhanced Ecological Validity:** By sampling actual QRIS users in real-world food stall transactions rather than relying on student samples, this research enhances the ecological validity of its findings, offering a more accurate picture of consumer behavior in informal economies. (3) Nuanced Understanding of Perceived Risk: Contrary to the traditional view of risk as a barrier, this study finds that well-managed perceived risk (i.e., low-risk perception) positively influences QRIS utilization. This highlights the effectiveness of Indonesia's regulatory framework and security features in transforming risk from a deterrent into a trust-building factor. To clarify the unique contributions, Table 12 contrasts our findings with those of related recent studies.

Table 12.
Comparison of Findings with Related QRIS Studies

Study	Key Focus	Main Findings	Differentiation from the Current Study
Current Study	Mediating effect of QRIS Usage on purchase decisions.	QRIS Usage significantly mediates the impact of ease of use and perceived risk on purchase decisions. Perceived risk does not directly affect purchases.	First, to model and test this full mediation pathway in the Indonesian food stall context, highlighting the indirect mechanism.

Table 13. (Continued)

Study	Key Focus	Main Findings	Differentiation from the Current Study
Sitohang et al. (2024)	Impact of ease of use on QRIS adoption by SMEs.	Confirmed ease of use as a strong predictor of QRIS adoption.	Focuses primarily on the direct adoption of QRIS, not on its subsequent effect on purchase decisions or the mediating role.
Kamilah (2024)	General factors influencing QRIS adoption in Indonesia.	Identified multiple factors (e.g., convenience, security) affecting adoption intention.	Provides a broader overview but lacks the specific focus on the food stall sector and the detailed path analysis connecting usage to actual purchase outcomes.

6. Conclusion

This study aimed to analyze the impact of ease of use and perceived risk on purchasing decisions through the use of QRIS at food stalls in Semarang City, Indonesia. The findings provide specific answers to the research questions and offer both practical and theoretical implications.

6.1. Summary of Key Findings

The analysis yielded several key conclusions. First, both ease of use ($\beta = 0.470$, $p < 0.001$) and perceived risk ($\beta = 0.377$, $p < 0.001$), where lower risk perception leads to higher adoption, were confirmed as significant predictors of QRIS utilization. Second, ease of use demonstrated a strong, direct positive influence on purchase decisions ($\beta = 0.822$, $p < 0.001$). Third, perceived risk did not have a significant direct effect on purchase decisions ($p = 0.926$). Fourth, while QRIS usage itself did not directly predict purchase decisions ($p = 0.735$), it played a crucial mediating role. Specifically, QRIS usage significantly mediated the relationship between ease of use and purchase decisions (Sobel = 5.291, $p < 0.001$) and fully mediated the relationship between perceived risk and purchase decisions

(Sobel = 2.184, $p = 0.028$). These results underscore that the benefits of easy-to-use systems and well-managed risk perceptions are most effectively translated into purchase behavior when consumers actively use the QRIS system.

6.2. Limitations

Despite these insights, the study has several limitations. First, the cross-sectional design limits the ability to establish causal relationships over time. Future longitudinal studies could better capture the evolution of consumer behavior and trust in digital payments. Second, the research was confined to Semarang City, which, while representative, may not fully capture the dynamics of other Indonesian regions with varying levels of digital literacy and economic development. Third, the sample size, though adequate for the statistical tests used, was relatively small. Finally, the reliance on self-reported data may introduce potential biases, such as social desirability or recall errors.

6.3. Practical Implications

The findings offer actionable insights for stakeholders. Food stall owners should prioritize simplifying the QRIS payment

process by using clear, visual QR code displays and providing basic instructions to customers. Digital payment providers and Bank Indonesia should focus on enhancing the accessibility of QRIS applications for less tech-savvy users and strengthening communication about security features to further lower perceived risk. Marketing campaigns should highlight not just the ease of use but also the tangible benefits of completing transactions via QRIS to drive higher conversion rates.

6.4. Suggestions for Future Research
Future research should explore additional variables that may influence QRIS adoption, such as social influence, promotional incentives, and price consciousness. A qualitative study could provide deeper insights into the specific risk concerns and usability barriers faced by different demographic groups. Comparative studies across different types of micro-enterprises (e.g., retail, services) and different geographic locations would enhance the generalizability of the findings. Finally, investigating the long-term impact of QRIS adoption on customer loyalty and business performance for food stalls would be a valuable extension.

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Appendix A: Measurement Items

Variable	Item Code	Measurement Item	Literature Source
Ease of Use (X1)	X1.1	QRIS application is easy to use for payments at food stalls	Venkatesh & Davis (2000)
	X1.2	QRIS payment features are easily accessible	
	X1.3	The interface and intructions in QRIS are clear and easy to understand	
	X1.4	QRIS provides flexibility in payment methods	
	X1.5	Overall, the QRIS system is simple and not confusing	
Perceived Risk (X2)	X2.1	I feel safe from fraud when using QRIS	Tan (2019)
	X2.2	The risk of financial loss when using QRIS is low	
	X2.3	I do not worry about delivery delays when using QRIS	
	X2.4	The product received matches my expectation when paying with QRIS	
	X2.5	My personal data are safe when using QRIS	
	X2.6	Information provided in QRIS transactions is clear and reliable	
Use of QRIS (Y1)	Y1.1	QRIS improves the payment process at food stalls	Arciniegas (2021)
	Y1.2	QRIS simplifies the payment process at food stalls	
	Y1.3	Using QRIS provides benefits in digital transactions	
Purchase Decision (Y2)	Y2.1	I buy products that meet my needs and desires	Speight et al., (2019) and S. Li et al., (2022):
	Y2.2	I am interested in trying products available through QRIS payment	
	Y2.3	I am confident in the quality of products purchased via QRIS	
	Y2.4	I am willing to make repeat purchases using QRIS	

Note. All items measured on a 5-point Likert scale: 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree.