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DIGITALIZATION OF MICRO-SIZED ENTERPRISES: DETERMINANTS OF QUICK RESPONSE CODE INDONESIAN STANDARD (QRIS), FINTECH USAGE BEHAVIOR, AND IMPLICATIONS FOR BUSINESS SUSTAINABILITY

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Abstract

There is an urgency for research on measuring the perceptions of micro-sized enterprises regarding the creation of a healthy FinTech ecosystem to support future business sustainability. The measurement analyzes social influence, trust, facilitating conditions, habits, financial literacy, intentions to continue Quick Response Code Indonesian Standard (QRIS) FinTech usage, and its impact on the sustainability of micro-sized enterprises sustainability. This research is expected to contribute by (a) providing an overview of the determinants that influence the actual usage behavior of the Quick Response Code Indonesian Standard (QRIS); (b) providing an overview of the impact of QRIS usage behavior on the sustainability of micro-sized enterprises; and (c) determining the most effective strategy to provide sustainable business solutions. The sampling technique utilized for this research included purposive random sampling with data collected from 240 micro-entrepreneurs spread across Java and Sumatra. These two islands have the largest number of QRIS users. Primary data were collected through surveys in several micro-entrepreneur communities. The research results show that facilitating conditions, habits, trust, and intentions to continue using QRIS, have a positive and significant effect on usage behavior. These determining factors of usage behavior will impact the sustainability of the business in the future. Social influence and digital financial literacy were not found to influence usage behavior.

Keyword: Behavioral Finance; Financial Literacy Theory; UTAUT 2; Business Sustainability

1. INTRODUCTION

Micro-sized enterprises are the backbone of Indonesia's independent economy and have great potential in improving peoples' welfare. The strategic role of micro-sized enterprises is reflected in their contribution to economic equality, poverty reduction, and increased state revenue. Data shows that micro-sized enterprises account for a significant part of the contribution of MSMEs to Indonesia's Gross Domestic Product (GDP) reaching 61.97%, with a value of more than Rp8,500 trillion. Changes in transaction patterns during the COVID-19 pandemic, especially through calls for the use of digital money, have encouraged micro-

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entrepreneurs to adapt to technology-based payment systems. The use of QRIS, which continues to be developed by Bank Indonesia through pro-growth payment system innovations, is the main choice in supporting business continuity.

The integration of the national digital payment system, including efforts to develop the digital rupiah, is supported by technological infrastructure which is an important factor in driving an inclusive and sustainable economy. The availability of adequate facilities for micro-entrepreneurs has proven to be a determinant in adopting digital financial services (FinTech). Based on QRIS usage data, Java Island ranks the highest at 71.6%, followed by Sumatra 16.5% and Kalimantan 4.4%. This reflects the disparity in infrastructure, population density, and business dynamics between regions. Interestingly, the majority of QRIS users come from the micro-sized enterprise sector, so understanding the digital behavior of micro-entrepreneurs is crucial in supporting sustainable digital economic transformation (Larnyo et al., 2022; Ponsree et al., 2021; Rahadi et al., 2022; Silanoi et al., 2023; Thaker etal., 2023; Wijaya et al., 2022; Zacharis & Nikolopoulou, 2022).

The process of FinTech adoption begins with intentions and develops into actual usage behavior, which is the active implementation of transaction routines using QRIS (Almaiah et al., 2022; Chaveesuk et al., 2021; Gupta & Arora, 2023; Pratama & Retnowardhani, 2023; Raza et al., 2021; Rudhumbu, 2022; Shahzad et al., 2022; Sukaris et al., 2021; Vărzaru et al., 2021). Routines that are carried out repeatedly indicate the formation of trust in QRIS users (Ha et al., 2023). Social influence also contributes to the successful adoption of QRIS based on the recommendation or influence of others, including work groups and friends (Bajunaied et al., 2023; Shahzad et al., 2022). Support from the QRIS user community can accelerate adoption as a means of payment transactions (Gupta et al., 2023; Puspitaningsih, 2023; Rahadi at al., 2022; Silanoi et al., 2023).

QRIS development has not been as smooth as its implementation. Problems encountered in this field include (a) the convenience of transacting using cash; (b) the availability of access to technology (smartphones, internet connections); (c) difficulties in operating financial technology and; (d) obstacles to integrating transactions using QRIS into existing bookkeeping systems. Empirical gaps in prior research include (a) differences in research results due to limitions in the sample area used; (b) a lack of ability to predict the sustainability impact of financial decisions, due to the majority of previous research being focused only on analysis of the factors influencing the intentions to use FinTech. Impact measurement comes from the perceptions of micro-entrepreneurs in creating a healthy FinTech ecosystem and supporting the sustainability of micro-sized enterprises in the future (Mansyur et al., 2023; Rahim et al., 2022; Sahabuddin et al., 2023; Vergara & Agudo, 2021). Measurements are made to test the formulation of the problem that has been determined.

Many previous researchers have used the Theory of Planned Behavior (TPB) and the Technology Acceptance Model (TAM) to predict behavior. However, this study utilizes the Unified Theory of Acceptance and Use of Technology (UTAUT 2) to predict the determinants of QRIS users. It is known that UTAUT 2 has limitations regarding the absence of financial literacy to strengthen intention changes into actual behaviour. This means that researchers must conduct more in depth studies to enhance this theory and build an improved model. The novelty provided by this research is in its focus on the latest research period, and modification and incorporation of new theories and research models. This research is expected to contribute to the literature by (a) providing an overview of the determining factors that influence the actual behavior of QRIS usage; (b) providing an overview of the impact of user behavior on the sustainability of micro-sized enterprises; and (c) determining the most effective strategy to provide solutions for micro-sized enterprises when adopting FinTech.

2. LITERATURE REVIEW

Behavioral finance introduces the idea that individual financial decisions are influenced by cognitive and emotional psychological factors. In the past, this approach was often applied to capital markets, where investors often act irrationally. Over time the concept of behavioral finance has shifted to individual behaviors in business management. Individual behavior is a response to an interaction between internal and external factors (Schunk, 2020). External factors in UTATU 2 are indicated by social influence, which indicates that micro-entrepreneurs do not always act rationally (Thaler, 2015). That is, they tend to be influenced by others when making adoption decisions, thus reinforcing social bias and impacting anomalies. UTAUT 2 considers the main factors that can be influenced by cognitive and emotional biases (Venkatesh et al., 2012), which usually occur in the capital market investor environment.

Behavioral finance shows that increasing literacy can reduce biases that influence financial decisions, so that many people are motivated to use technology. Confidence in using financial technology is strengthened by educational interventions when improving financial literacy. A solution to the problems that occur in this field is the need for mature financial literacy when adopting FinTech.

One strategy for solving the problem of the limitations of the UTAUT 2 Theory is to combine with Financial Literacy Theory, complementary to Middle Theory so that it can become the basis for the research model (Ingale & Paluri, 2020; Dewi et al., 2021). There are several factors represented in UTAUT 2 such as social influence, facilitating conditions, financial habits, beliefs, behavioral intentions, and financial literacy, which can contribute to the prediction of user behavior in relation to QRIS usage so that it can be utilized in such a way as to positively impact the sustainability of micro-sized enterprises (Najib et al., 2021). Digital financial literacy is used as the middle theory to refine UTAUT 2, as this theory is more relevant to the study of digital payments than financial literacy. The adoption decision in this research is the implementation of behavioral finance which is a Grand Theory within the variable construct of FinTech usage behavior. In addition to combining three major theories as a refinement, this research also expands on the results of previous research by combining these previous studies into a new model (Alomari & Abdullah, 2023; Bajunaied et al., 2023; Najib et al., 2021; Rabaa'I, 2021).

QRIS should be chosen to support government policies to reduce cash circulation because it is a new type of FinTech, which offers payment facilities that are focused on MSME players. This means that QRIS offers multiple conveniences, including reliability in tracking transaction history in real-time, time and cost efficiency, and improved ease of recapitulating sales results in financial reports in order to monitor business development. These various conveniences will certainly have a positive impact on the development of micro-sized enterprises.

3. RESEARCH METHODS

A systematic literature review (SLR) is a secondary research method used to systematically and transparently identify, evaluate, and synthesize research findings relevant to a particular research question. In this study, the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) protocol was used to ensure the literature search, selection and reporting stages were rigorous and structured (Page et al., 2021). This approach is effective in answering research questions as it allows researchers to comprehensively screen and assess published evidence. The stages of an SLR include formulation of research objectives and questions, a literature search, study selection based on inclusion and exclusion criteria,

systematic data extraction, quality assessment of key studies, and synthesis of findings to develop valid and actionable conclusions (Munn et al., 2018).

3.1 Research Questions on Literature Review Studies

Research Motivation Questions	Research Motivation Answers
• What variables most influence the adoption behavior of using FinTech QRIS? • What strategies need to be used to increase the adoption behavior of using FinTech QRIS towards business sustainability	• Analyzing the variables that influence the adoption behavior of FinTech QRIS usage. • Analyzing the most effective strategies used to increase the adoption behavior of FinTech QRIS usage to encourage business sustainability.

3.2 Literature Search Process

The following flow diagram provides an overview of the stages of the journal search process used in this study:

Figure 1 Literature Search Flow

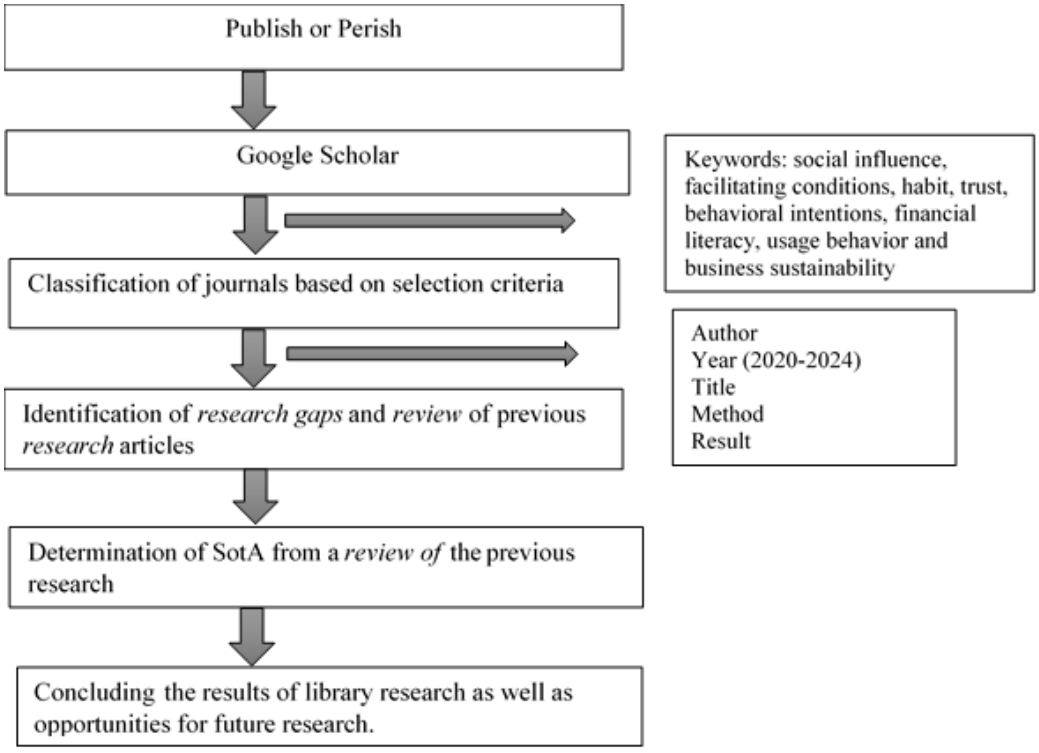
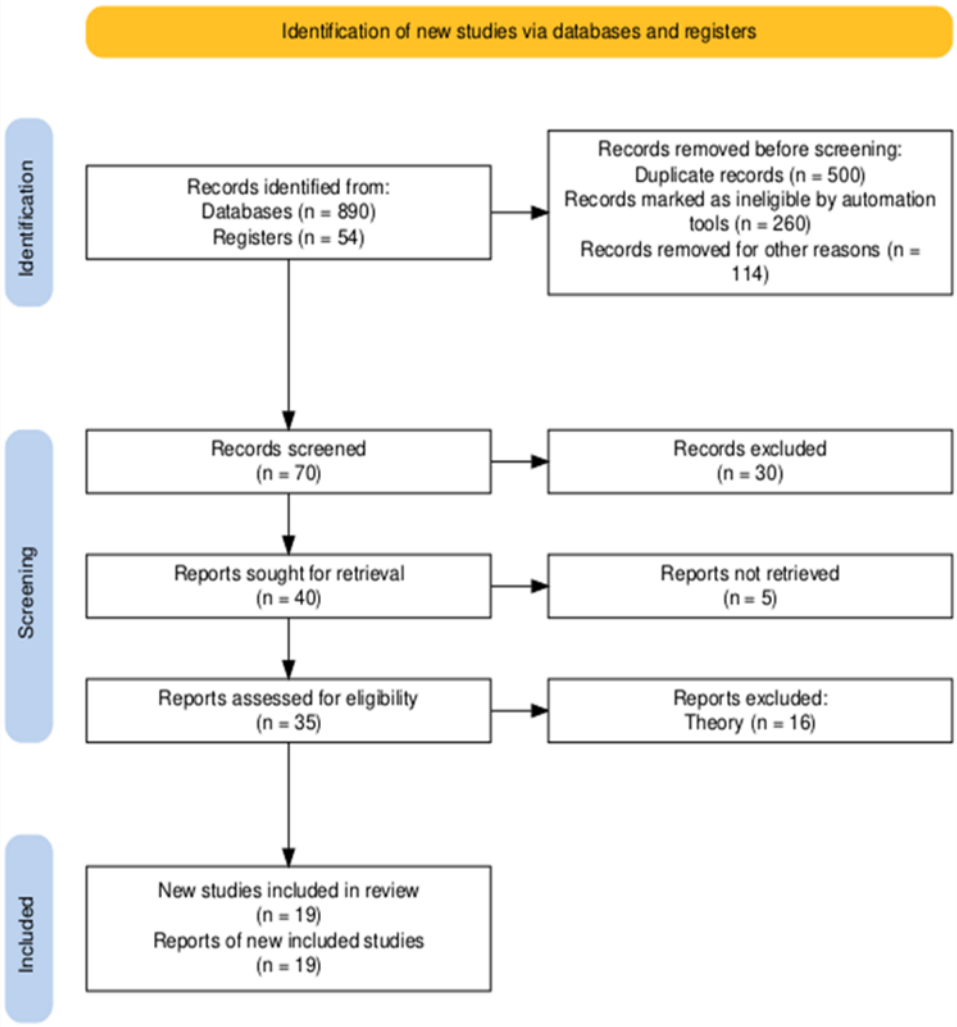


Figure 1 illustrates the stages of the literature search conducted in this study using a Systematic Literature Review (SLR) approach. The process began with the Publish or Perish application connected to Google Scholar, using relevant keywords. Articles were selected based on predetermined criteria. Articles were then analyzed to identify research gaps and compile the state of the art (SotA) analysis of current understanding. The final stage consisted of summarizing the literature findings and identifying further research opportunities.

3.3 Selection Criteria

Figure 2 Literature Selection Criteria According to PRISMA Protocol



Based on the literature search process detailed above, a Systematic Literature Review (SLR) with the PRISMA protocol was used to facilitate the identification of relevant journal literature. The criteria used for the selection of relevant studies included: (a) publication during the latest research period, specifically from 2020 - 2024 and indexed in Scopus; (b) using the UTAUT 2 theory; (c) having quantitative research methods; (d) a research focus on financial technology adoption behavior. In total, 70 journal articles were reviewed and then narrowed down after going through several stages of selection based on the criteria. The final results of the SLR provided 19 relevant journals, which were then used as the basis for answering the research questions of this study.

4. RESEARCH RESULTS

Results of the Systematic Literature Review (SLR)

The results of SLR research from several previous studies on FinTech adoption decisions are as follow.

Table 1 Results of Literature Review on Fintech Adoption

No.	Authors	Year	Title	Indexed by Scopus	Country	Theory	Method	Research Results
1	Amnas et al.	2023	Understanding the Determinants of FinTech Adoption: Integrating UTAUT2 with Trust Theoretic Model	Q2	India	UTAUT 2, TTM	Quantitative	(+) SI - BI (+) H - BI (+) FC - BI (+) T – BI (+) T - FU (+) BI – FU **FinTech services**.
2	Gupta et al.	2023	Does Previous Experience with the Unified Payments Interface (UPI) Affect the Usage of Central Bank Digital Currency (CBDC)?	Q2	India	UTAUT, UTAUT 2	Quantitative	(+) SI - UB (+) BI – UB **CBDC**
3	Kilani et al.	2023	Consumer Post-Adoption of E-Wallet: An Extended UTAUT2 Perspective with Trust	Q1	Jordan	UTAUT 2	Quantitative	(+) H – CUI (+) H – CUB (+) T – CUI (+) CUI – CUB **E-Wallet**
4	Martinez & McAndrews	2023	Investigating U.S. Consumers' Mobile Pay through UTAUT2 and Generational Cohort Theory: An Analysis of Mobile Pay in Pandemic Times	Q2	US	UTAUT 2	Quantitative	<u>Before the COVID Pandemic:</u> (+) H - AU (+) BI - AU (+) FC - BI (+) H - BI (-) SI - BI <u>During the COVID Pandemic:</u> (-) FC – BI (-) SI - BI (+) H – BI (+) H - AU (+) BI – AU **m Pay**

5	Najib et al.	2021	FinTech in the Small Food Business and Its Relation with Open Innovation	Q1	Indonesia	UTAUT 2	Quantitative	(+) SI - FA (+) FC - FA (+) K – FA (+) FA – BS **P2P lending**
6	Rabaa'I	2021	An Investigation into the Acceptance of Mobile Wallets in the FinTech Era: An Empirical Study from Kuwait	Q3	Kuwait	UTAUT 2	Quantitative	(+) FC – BI (+) T - BI (+) FC - UB (+) BI – UB **m-Wallet Applications**
7	Shin & Lee	2021	Factors Affecting User Acceptance for NFC Mobile Wallets in the U.S. and Korea	Q2	US & Korea	UTAUT 2	Quantitative	Korea: (+) H – BI (+) BI – UB US: (+) H – BI (+) BI – UB **NFC Mobile wallets**
8	Sukaris et al.	2021	Usage Behavior on Digital Wallet: Perspective of the Theory of Unification of Acceptance and Use of Technology Models	Q4	Indonesia	UTAUT 2	Quantitative	(+) SI – BI (+) FC - BI (+) T - BI (+) BI – UB **Digital Wallets**
9	Thaker et al.	2023	Cashless society, E-wallets and Continuous Adoption	Q2	Malaysia	UTAUT 2	Quantitative	(+) SI – BI (+) FC - BI (+) T – BI (+) H - BI (+) BI – CA (+) FC – CA (+) H – CA **E-wallets**
10	Sharma & Vaid	2022	Factors Affecting M-Payment Adoption In Milenials - Testing Extended UTAUT2 Model	Q4	India	UTAUT 2	Quantitative	(+) FC – BI (+) BI – UB **Mobile Payment**

11	Suo et al.	2022	Factors Influencing Behavioural Intention to Adopt the QR-Code Payment: Extending UTAUT2 Model	Q1	Malaysia	UTAUT 2	Quantitative	(+) SI – BI (+) H – BI **QR Code Payment**
12	Lin et al.	2020	Factors A ecting the Behavioral Intention to Adopt Mobile Payment: An Empirical Study in Taiwan	Q1	Taiwan	UTAUT 2, DOI	Quantitative	Group 1 (+) SI – BI (+) FC – BI Group 2 (+) FC – BI Group 3 (+) SI – BI **Mobile Payment**
13	Yaseen et al.	2022	Islamic Mobile Banking Smart Services Adoption and Use in Jordan	Q3	Jordan	UTAUT, UTAUT2	Quantitative	(+) BI – UB (+) T – BI **Mobile Banking**
14	Malarvizhi et al.	2022	Predicting the Intention and Adoption of Near Field Communication Mobile Payment	Q2	Malaysia	UTAUT 2	Quantitative	(+) SI – INT (+) FC – FA (+) INT – FA (+) SI – INT – FA **Mobile Payment**
15	Chaveesuk & Piyawat	2021	Use of QR Code Technology in Eastern Thailand: Entrepreneur Perspective	Q3	Thailand	UTAUT 2	Quantitative	(+) SI – INT (-) H - INT **QR Code**
16	Zhong & Moon	2022	Investigating Customer Behavior of Using Contactless Payment in China: A Comparative Study of Facial Recognition Payment and Mobile QR-Code Payment	Q2	Cina	TAM, UTAUT 2	Quantitative	(+) H – CU **QR Code**

17	Penney et al.	2021	Understanding Factors That Influence Consumer Intention to Use Mobile Money Services: An Application of UTAUT2 With Perceived Risk and Trust	Q1	Ghana	UTAUT 2	Quantitative	(+) SI – BI (+) FC – BI (+) H – BI (+) H – UB (+) T – BI (+) BI – UB **Moble Money**
18	Chinh et al.	2024	Impact of Self-Efficacy and Mediating Factors on FinTech Adoption in The VUCA Era	Q3	Vietnam	UTAUT 2, Social Cognitive	Quantitative	(+) IT – UCS (+) IT – USS (+) IT – UPS **Digital Payment**
19	Martinez & McAndrews	2022	Do you take...? The effect of mobile payment solutions on use intention: an application of UTAUT2	Q1	US	UTAUT 2	Quantitative	(+) FC – INT (+) H – INT (+) H – UB (+) INT – UB **QR Code**

Note:
SI: Social Influence, FC: Facilitating Conditions, H: Habit, BI: Behaviorial Intentions, FA: FinTech Adoption, T: Trust, FU: FinTech Use, AU: Actual Use, UB: Usage Behavior, CUI: Continued Usage Intentions, CUB: Continued Usage Behavior, K: Knowledge, BS: Business Sustainability, CU: Continuance Usage, CA: Continuous Adoption, IT: Intentions to Use, UCS: Using Credit Service, USS: Using Savings Service, UPS: Using Payment Service, INT: Intentions to Use.

Some of the criteria established for conducting the Systematic Literature Review (SLR) were as follows:

a. **Selection of the most recent publications (2020–2024) indexed by Scopus.** The search was limited to studies published within the last five years (2020–2024), assuming that the most recent literature provides the most accurate and relevant insights. In addition, only journals indexed in Scopus (Q1–Q4) were selected, ensuring that the reviewed literature met high-quality publication standards.
b. **Geographical distribution across several continents.** The reviewed studies were conducted across multiple continents, specifically Asia, Africa, and North America, providing a diverse geographical representation for understanding technology adoption behavior.
c. **Application of the UTAUT 2 framework.** UTAUT 2 was chosen as the primary theoretical framework as it refines and extends the original UTAUT model. The use of UTAUT 2 ensures consistency in the variables analyzed and the research frameworks reviewed, making the studies eligible for inclusion in this SLR.
d. **Quantitative Research Focus.** The SLR was deliberately focused on quantitative studies to ensure that subsequent analysis could be statistically tested and validated.
e. **Research focused on technology adoption behavior.** The selected studies specifically examined technology adoption behavior, particularly within the FinTech sector. This focus provides clarity and consistency in the research object and aligns with the aim of the current study to explore the behavioral aspects of digital payment adoption.

Based on the SLR results detailed above, there are many factors that determine the behavior of FinTech users, such as social influence, facilitating conditions, habits, trust, behavioral intentions, and financial literacy. Most of these variables show a positive and significant influence. However, among these research variables, social influence was found to be the most dominant, followed by facilitating conditions and behavioral intentions. This shows that social influence is very important in determining QRIS adoption. Looking at the demographic structure of Indonesian society, information can easily spread by word of mouth, and people tend to be easily influenced by the behavior of others in their social network, such as friends, coworkers, and family.

In the context of micro-entrepreneurs, technology adoption decisions tend to be influenced by the social environment, such as recommendations from business peers or communities, which give higher trust to new technologies. Strategies to accelerate the adoption of QRIS in various demographics, carried out by government authorities or in collaboration with private parties, technology companies, and community leaders, can be very helpful. Based on this, it is concluded that social influence has a positive and significant effect on QRIS usage behavior. This conclusion is relevant to previous research (Rahadi et al., 2022).

It can also be seen that the variable that has the least influence or rarely appears is financial literacy. This shows that financial literacy is not a dominant factor in the technology adoption decisions by micro-entrepreneurs, regarding new technologies such as QRIS. However, financial literacy remains an important factor as it can strengthen understanding of the long-term benefits of adopting such technology. A combination of strong social influence and adequate financial literacy will encourage more sustainable adoption.

This is relevant to the limitations of UTAUT 2, namely the absence of financial literacy elements to strengthen the change from intentions to use into actual behavior (Duarte & Pinho, 2019). Behavioural finance also shows that increasing literacy can reduce cognitive biases that affect financial decisions so that more people are motivated to use new technologies such as

QRIS (Verma & Sinha., 2020). Based on these results, the VOSviewer application was used in order to confirm the influence between these variables. The results are as follows:

Figure 3. Vosviewer Results

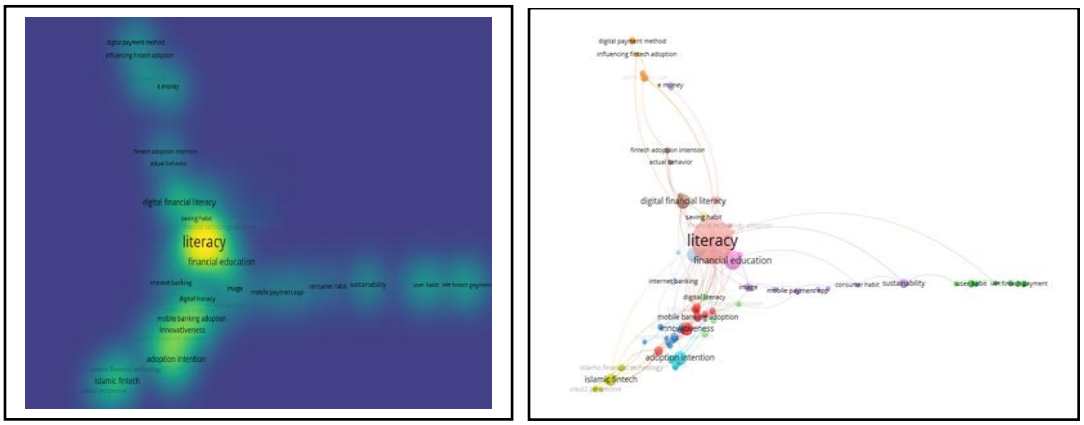


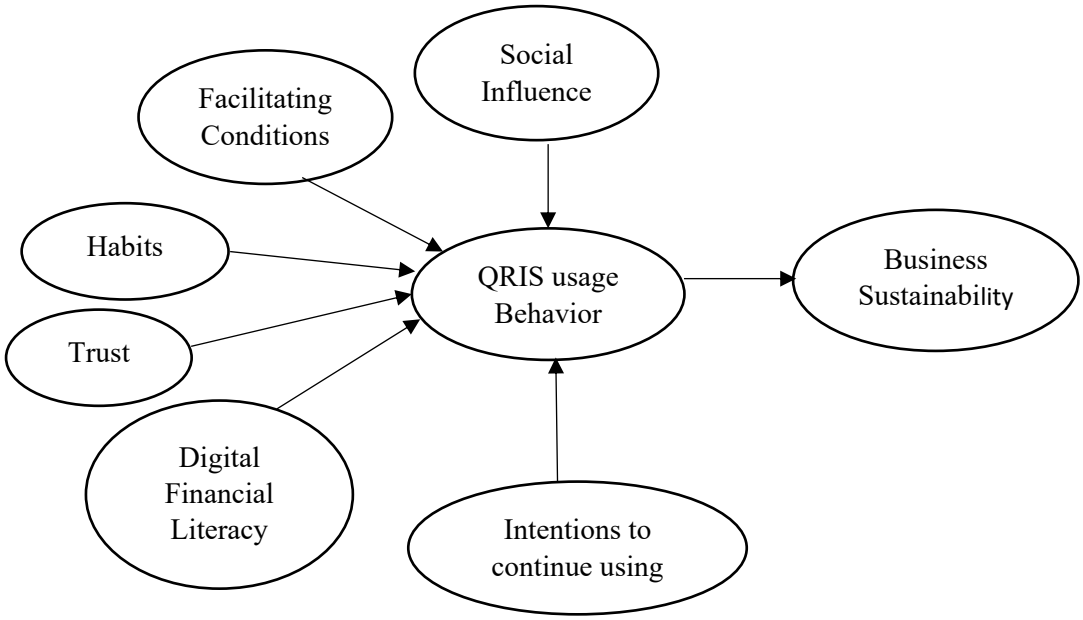
Figure 3 (above) shows that there are relationships between variables that remain very rarely touched or studied by other researchers. The impact of FinTech adoption, in particular, can be explained by social influence, facilitating conditions, habits, trust, financial literacy, and behavioral intentions. It can be seen that the majority of previous research stops at the behavioral intentions stage, where an intention is only an early predictor before the adoption of behavior occurs. However, an intention does not necessarily indicate proceeding to the next stage, namely adoption, as it is still only a possibility.

This study reconstructed the behavioral intentions variable into an intention to continue using. This approach makes it easier for researchers to obtain respondents among the micro-entrepreneur population who have definitely accepted and adopted QRIS. Thus, it becomes possible to retrace the initial intention to use QRIS by micro-entrepreneurs. This is important because by evaluating the intention to continue using, to is possible to understand the factors that encourage the sustainability of technology adoption and the experiences that strengthen the initial decision to use QRIS.

In Figure 3, the circle representing financial literacy has a large size, indicating that the literature is saturated with research on this topic. We have tried to reconstruct this variable into digital financial literacy, which is shown to be only very rarely used by other researchers in Fogure 3. We feel that digital financial literacy is more relevant to FinTech and specifically QRIS, because both are digitally-based technologies. Nevertheless, conventional financial literacy remains necessary as a basis for controlling technology and as a guideline for adaptation to digital transformation. Someone who is financially literate must have basic knowledge of financial concepts, so that they can neutralize any errors in the system. Based on the explanation above, the research model was reconstructed as shown in Figure 4:

Digitalization is the process of transforming traditional systems into digital technology-based systems to improve business efficiency, accessibility, and performance. In the context of micro-sized enterprises, digitalization through technology adoption such as the FinTech innovation QRIS, allows for improved operational efficiency, increased market access, and sustainability innovation, which encourages business models to be more adaptive and relevant to present times. By utilizing digital technology, micro-sized enterprizes can achieve sustainability through increased profitability, competitiveness, and adaptability to external challenges such as a pandemic or market change. UTAUT 2 is used in analyzing user behavior to understand the factors that influence technology adoption behavior.

Figure 4 Reconstruction of The Research Model



Based on the construct model above, this study aimed try to combine three theoretical models, namely Behavioral Finance as the Grand Theory, Financial Literacy Theory as the Middle Theory, and UTAUT 2 as the Applied Theory. Behavioral Finance underlies the emergence of FinTech adoption, where, in this study the variable QRIS usage behavior is built. The reason for this is that QRIS usage behavior indicates that there has been a process of accepting the adoption of FinTech and then the development of this into a behavior. The combination of these three theories aims to strengthen each weakness in the individual theories. We realize that the reliability of a new model is not necessarily accurate if it has not gone through a testing process.

Table 2 Measurement Objects

Variable	Code	Indicator	References
Use Behavior	UB	● I often use QRIS when transacting business, such as when making sales. ● I often use QRIS as a compatible service in recording transaction history. ● I often use QRIS.	Gupta et al (2023)
Social influence	SI	● People close to me suggest using QRIS, when transacting business. ● People close to me believe that transacting through QRIS is important for me. ● People close to me encourage me to use QRIS, when transacting business.	Sleiman (2023).
Facilitating Condition	FC	● I have the necessary supporting facilities to use QRIS. ● The QRIS system fits my business model perfectly. ● I can get help from others when I encounter difficulties.	Najib et al (2021)

Habit	H	● Using QRIS for business transactions has become a habit for me ● I am addicted to using QRIS. ● I need to use QRIS.	Shin & Lee (2021)
Trust	T	● I think using QRIS is safer than transacting in cash. ● I chose to use QRIS because of its reputation as a service provider. ● I believe QRIS will protect my money.	Ha et al. (2023)
Digital Financial Literacy	DFL	● I think, if digital financial literacy is lacking, it will be difficult to use QRIS financial technology. ● I feel that my lack of digital financial literacy makes me reluctant to use QRIS financial technology. ● I think that repeated use of QRIS financial technology will help me to be more confident in business transactions.	Ha et al. (2023)
Intention to continue using	ICU	● I will positively consider QRIS FinTech as an option to facilitate business transactions. ● I intend to continue using QRIS FinTech, as long as it provides benefits for business continuity. ● I plan to continue using QRIS FinTech in the long term.	Laksamana et al. (2022).
Business Sustainability	BS	● For me, accepting payments from QRIS FinTech improves my business capabilities. ● My business turnover increases sustainably, when using QRIS. ● The use of QRIS FinTech makes business competition healthy.	Yakob et al. (2021)

PLS SEM Results

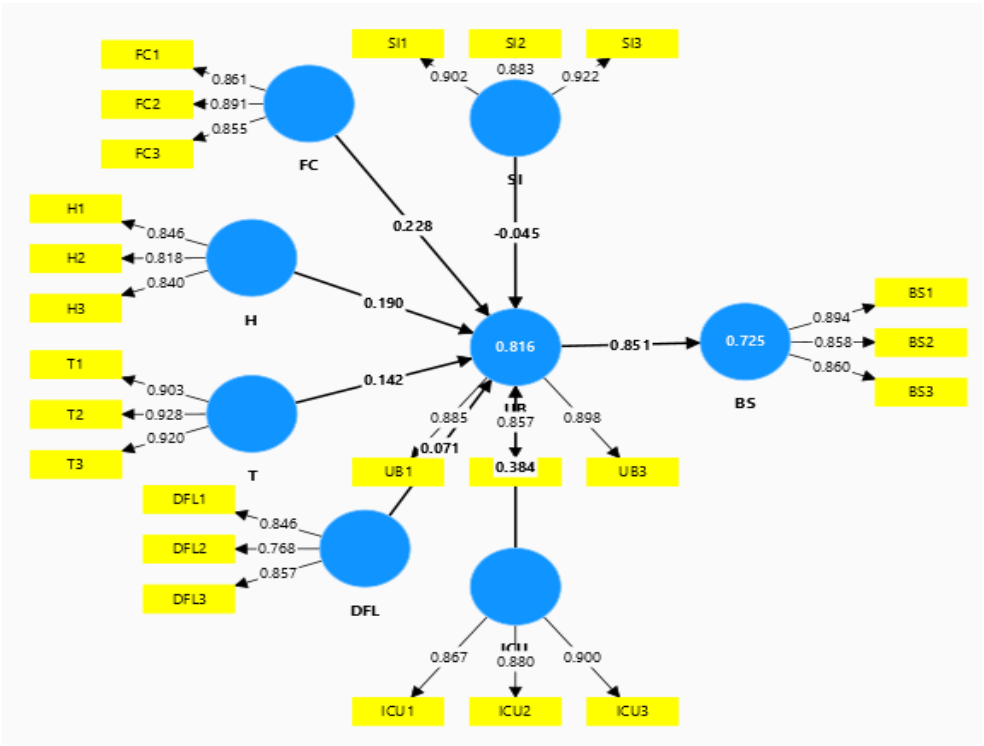
Table 3 Respondent Characteristics

Characteristic	Criterion	Frequency (n = 240)	Percentage (%)
Gender			
	Male	82	34%
	Female	158	66%
Age			
	11-26	67	28%
	27-42	143	60%
	43-58	26	11%
	>58	4	2%
Education			
	< High School	3	1%
	High School	59	25%
	Diploma	54	23%
	Bachelor	114	48%
	Postgraduate	10	4%

Island			
	Java	120	50%
	Sumatra	120	50%
UsingQRIS			
	>1 year	135	56%
	>3 year	105	44%

Data were collected from respondents representing a sample of 240 micro-sized enterprises from Java and Sumatra, the two largest islands of QRIS users. Respondent characteristics are detailed in Table 3. The micro-sized enterprises category with a history of establishment of at least 3 years was chosen because operation of at least 3 years is associated with higher business stability. Respondents were also required to have minimal experience using QRIS for at least 1 year.

Figure 5 PLS-SEM Algorithm Results



Validity Testing

Table 4 Convergent Validity Testing Results

	BS	DFL	FC	H	ICU	SI	T	UB
BS1	0.894							
BS2	0.858							
BS3	0.860							
DFL1		0.846						
DFL2		0.768						
DFL3		0.857						
FC1			0.861					

FC2	0.891						
FC3	0.855						
H1		0.846					
H2		0.818					
H3		0.840					
ICU1			0.867				
ICU2			0.880				
ICU3			0.900				
SI1				0.902			
SI2				0.883			
SI3				0.922			
T1					0.903		
T2					0.928		
T3					0.920		
UB1						0.885	
UB2						0.857	
UB3						0.898	

Based on the results of convergent validity testing, all items have loading factor values greater than 0.70, indicating that these items meet the criteria for convergent validity.

Table 5 Discriminant Validity: AVE vs. Correlations

	BI	**DFL**	**FC**	**H**	**ICU**	**SI**	**T**	**UB**
BI	**0.871**							
DFL	0.770	**0.824**						
FC	0.841	0.771	**0.869**					
H	0.823	0.780	0.819	**0.835**				
ICU	0.837	0.800	0.845	0.824	**0.883**			
SI	0.776	0.790	0.800	0.810	0.813	**0.902**		
T	0.796	0.779	0.792	0.827	0.796	0.826	**0.917**	
UB	0.851	0.777	0.839	0.828	0.867	0.783	0.804	**0.880**

Note: Bold values on the diagonal represent the square root of the Average Variance Extracted (AVE); values off the diagonal represent correlations between the constructs.

Based on the discriminant validity testing using the Fornell-Larcker criterion, all constructs were found to have square root values of the Average Variance Extracted (AVE) greater than their correlations with other constructs. This result indicates that discriminant validity is achieved.

Table 6 Coefficient of Determination Test Results

	R-square	**Adjusted R-square**
BS	0.725	0.724
UB	0.816	0.812

As shown in the table above, the adjusted R-square value for usage behaviour is 0.812, indicating that 81.2% of the variation in usage behaviour can be explained by the variables of social influence, facilitating conditions, habits, trust, digital financial literacy and intentions to continue using. The R-square result for business sustainability is 0.725, showing that 72.5% of

variation in the business sustainability variable can be explained by QRIS usage behaviour.

Figure 6 Results of the Path Coefficients and Corresponding p-Values

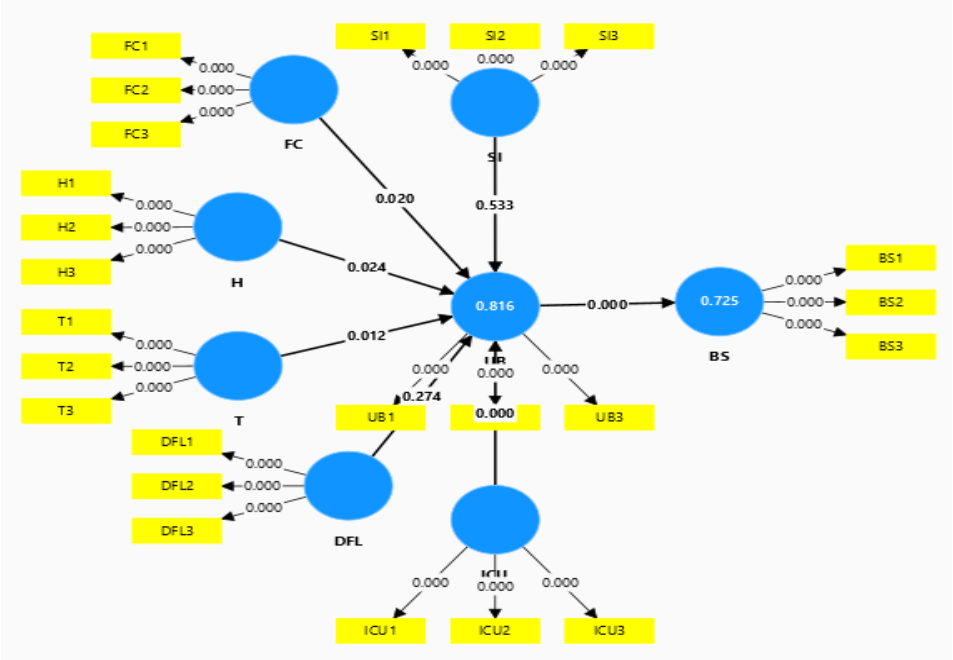


Table 7 Hypothesis Testing Results

	Original sample (O)	T-statistics (|O/STDEV|)	P value	Outcome
DFL → UB	0.071	1.094	0.274	Not supported
FC → UB	0.228	2.334	0.020	Supported
H → UB	0.190	2.261	0.024	Supported
ICU → UB	0.384	5.447	0.000	Supported
SI → UB	-0.045	0.623	0.533	Not supported
T → UB	0.142	2.513	0.012	Supported
UB → BS	0.851	24.598	0.000	Supported

Note: level of significance = 5%

As shown in Table 7, the variables of facilitating conditions (FC), habits (H), trust (T), and intentions to continue using (ICU) were found to have a significant positive effect on QRIS usage behavior (UB). Meanwhile, digital financial literacy (DFL) and social influence (SI) were not shown to have a significant effect on QRIS usage behavior. In addition, QRIS usage behavior (UB) was found to have a significant positive effect on business sustainability (BS). These findings contribute to strengthening the relevance of previous studies, as summarized in the SLR, while they also confirm the critical role of technological and behavioral factors in the adoption of QRIS for sustainable business development.

5. DISCUSSION

The resources required for digital transactions and applications for business transactions must be supported by facilitating conditions. A person or individual tends to want to make

adoption decisions and use FinTech when appropriate resources and support are available (Alomari & Abdullah, 2023). Facilitating condition factors can be in the form of facility availability, technical support, system compatibility, technical knowledge and supportive social norms. This is supported by the work of Larnyo et al. (2022); Ponsree et al. (2021); Rahadi et al. (2022); Silanoi et al. (2023); Taamneh et al. (2023); Thaker et al. (2023); Uddin et al. (2020); Wijaya et al. (2022); and Zacharis & Nikolopoulou (2022), which states that facilitating conditions have a positive and significant effect on QRIS usage behavior.

Business development in the era of all-digital technology causes changes in business transaction behavior patterns, whereby previously conventional behaviors shift towards digital means. Micro-entrepreneurs who have good financial habits tend to be more open to financial technology innovations such as QRIS as they predict benefits in terms transaction efficiency and better financial management. The results of this study support previous research, specifically regarding the concept that financial habits have a positive and significant effect on QRIS usage behavior (Handoko et al., 2021; Martinez & McAndrews, 2023; Najib et al., 2021; Wu et al., 2022; Zhong & Moon, 2022). This means that well-organized and good financial habits are a driving factor in the acceptance and use of new financial technology, such as QRIS.

The intention to continue using QRIS has a positive and significant effect on usage behavior, which supports previous research (Ponsree et al., 2021; Shahzad et al., 2022; Uddin et al., 2020). The intention to continue using QRIS reflects an awareness and belief among business actors in the long-term benefits of using QRIS in daily business operations. When micro-entrepreneurs feel that QRIS provides benefits such as time efficiency, improved ease of transactions, and security, they will tend to have a strong intention to continue using this technology. It is this strong intention that ultimately encourages them to consistently adopt and use QRIS in their business activities.

Trust has a positive and significant influence on the adoption behavior and use of QRIS in micro-entrepreneurs as trust is one of the key factors in the adoption of financial technology. In the context of micro-sized enterprises, trust in QRIS includes the belief that the system meets high security standards, maintains the confidentiality of customer data, and facilitates uninterrupted transactions. When micro-entrepreneurs believe that QRIS is safe to use and provides benefits in making transactions, they will be more open to utilizing it as the main payment tool. This supports previous research (Ha et al., 2023; Rabaa'I, 2021; Wu et al., 2022).

QRIS adoption behavior by micro-entrepreneurs affects business continuity in the future. This supports the studies of Basar et al, (2024) and Najib et al. (2021), which stated that the behavior of adoption of financial technology has a positive effect on business sustainability. It is important to focus on how QRIS improves transaction efficiency, reduces operational costs, and increases digital market access. Proper FinTech adoption not only eases operations, but also encourages customer loyalty, thus ensuring long-term business sustainability. Cooperation between the government, private sector, community, and related parties, is necessary to encourage adoption behavior, especially in the micro-sized enterprise sector (small merchants), in order to successfully build sustainable businesses.

The findings show that social influence does not have a negative or significant influence on QRIS adoption and usage behavior. This means that micro-entrepreneurs decisions to adopt QRIS are not strongly influenced by social encouragement from the surrounding environment. Social influence has a minimal impact in encouraging micro-entrepreneurs to adopt digital payment technology, including QRIS. Prior research has concluded that micro-entrepreneurs' decisions are based more on functional and economic considerations than social factors (Lee at al., 2022). The adoption decision for QR code payments (QRIS) focuses more on the direct benefits of the technology for business sustainability (Zhang et al., 2023). In addition, it is assumed that as the majority of the respondents in this study are bachelor or postgraduate degree holders, they have higher than average intelligence and that they will be objective when

making adoption decisions.

Digital financial literacy does not significantly affect usage behavior. There are several trends of note in this regard: (a) QRIS adoption is often driven more by external factors such as incentives from the government, market competition, or daily business needs, rather than solely because of the knowledge or digital financial literacy of business actors. Many micro-entrepreneurs, despite having a low level of digital financial literacy, will adopt QRIS because they see the practical benefits for business operations, such as increasing the speed of transactions or facilitating financial recording (Khan et al., 2022); (b) micro-entrepreneurs may rely on third parties (such as banks or financial agents) to assist them in the use of this technology, so their level of digital literacy is not a key factor in the adoption decision; (c) the majority of respondents are university graduates, so the issue of digital financial literacy is not a crucial issue, as it easy for them to master and operate QRIS in their business. Supported by Zhang et al. (2023), digital financial literacy does not directly influence QRIS adoption decisions, especially among micro-enterprises, which are more heavily influenced by factors such as cost, external support, and direct business benefits. This research also emphasizes that, in some cases, micro-entrepreneurs place a greater focus on the functional aspects of QRIS than their own digital capabilities.

Micro-sized enterprises can follow the steps below when using QRIS in their business operations:

1. **Registration.** Micro-entrepreneurs register through a Payment System Service Provider (PJSP), such as a bank or digital wallet application. This process involves filling in business data and related documents.
2. **QRIS Code Generation.** Once registered, the PJSP provides a unique QRIS code that can be used to receive payments.
3. **Installation and Socialization.** QRIS codes are placed at business locations or online platforms to make it easier for consumers to make payments. Micro-entrepreneurs can provide simple education to customers on how to use QRIS.
4. **Transaction and Recording.** Consumers scan the QRIS code with a payment application. Transactions are recorded automatically and in real-time on the MSME application, so as to facilitate financial reporting.

The most effective strategies in improving QRIS adoption behavior to drive long-term business sustainability include:

1. A focus on strengthening intentions to continue using (ICU → UB). This can incorporate:
   a. Continuous education based on the real benefits of QRIS
   b. Testimonials or case studies of successful merchants
   c. Improved user experience for using QRIS

   This is important because intentions to continue use are a direct and strong driver of actual usage behavior.
2. Strengthening facilitating conditions (FC → UB). This could include:
   a. Providing supporting facilities, such as QRIS training, internet access, and technical assistance.
   b. Micro-sized enterprise community-based socialization to share best practice.

   When businesses feel technically and practically supported, they are more confident to adopt digital systems.
3. Encouraging habituation through routine use (H → UB). This could be achieved through:
   a. Incentivization for the daily use of QRIS (e.g. cashback or merchant promos).
   b. Integration of QRIS with frequently used transaction platforms (e.g. WhatsApp, or

marketplace).

This is important because positive habits shape long-term behavior and lower resistance to digital innovations.

4. Building trust (T → UB). This could include:
   a. Public campaigns on QRIS transaction security and protection.
   b. Certification for QRIS trusted merchant security.

   This is important because trust is a foundational attribute in the decision to continue using digital financial services.
5. Strengthening relationships (UB → BS). This could include:
   a. Involving QRIS in the transaction recording and financial reporting of micro-sized enterprises.
   b. Using QRIS as a microfinance performance measurement tool (digital dashboard).

   This is important because consistent QRIS usage behavior has a direct impact on the efficiency and competitiveness of micro-sized enterprises.

6. CONCLUSIONS

This research has demonstrated a close relationship between digitalization, the UTAUT 2 analytical framework, and micro-sized enterprise sustainability through the adoption of the FinTech, QRIS. Digitalization serves as an important foundation for business sustainability by reducing waste, improving energy efficiency, and supporting innovation in business processes. The UTAUT 2 framework helps to identify key factors, such as facilitating conditions, habits, trust, and intentions to continue using, which are significant in shaping QRIS usage behavior. Business sustainability is achieved when micro-entrepreneurs consistently integrate this technology in their operations.

Although the direct effects of social influence and digital financial literacy on QRIS usage behavior were not statistically significant in this study, previous research provides strong conceptual support for their relevance in digital payment adoption. Kasri and Yuniar (2021) emphasized that higher financial literacy enhances individuals' understanding of benefits and risks, builds confidence in using financial technologies, and fosters more informed and rational decision-making. Moreover, studies by Setiawan et al. (2023) and Yang et al. (2021) found that social influence acts as a significant mediating factor in strengthening the intention to continue adopting digital payment systems. Therefore, it is reasonable to believe that, although not significant in the present model, improving financial literacy and leveraging social influence could contribute to future behavioral shifts, particularly as digital payment ecosystems mature and user familiarity increases over time.

6.1 Limitations

This study has several limitations, including: (1) the research was conducted in Indonesia, limited to Java and Sumatra; (2) the study did not include moderator variables in UTAUT 2; (3) only cross-sectional data were used; (4) the variables used were limited to UTAUT 2; and (5) hypothesis testing was unidirectional only.

6.2 Recommendations

From this research, recommendations for relevant stakeholders and future research include:

For the Government: (a) Improve digital infrastructure in areas that lack access to technology, to support facilitating conditions; (b) Launch a national campaign highlighting the

success stories of micro-entreprizes using QRIS to increase trust and encourage adoption; (c) Provide tax incentives or subsidies to micro-entrepreneurs that actively use QRIS to support their business sustainability.

For FinTech Service Providers: (a) Develop new features which improve user experience and make it easier for micro-entrepreneurs to manage their transactions, such as the integration of automated financial reports; (b) Provide education programs that focus on improving digital and financial literacy, especially for micro-entrepreneurs in rural areas; (c) Strengthen user data security to increase trust in digital payment systems.

For micro-entrepreneurs: (a) Conduct internal training to improve employee understanding of the use of QRIS in business operations; (b) Utilize QRIS to expand market reach by integrating this system into e-commerce or social media platforms; (c) Invest in basic technological tools to support efficient digital operations.

For future researchers: (a) Comparative cross-country studies or one country studies, similar to this study, sampling 2 different islands, could conduct multi group analysis; (b) Add moderator and mediator variables into the UTAUT 2 model; (c) Conduct longitudinal rather than cross-sectional studies, as these are needed to identify changes in QRIS usage behavior and its impact on business sustainability; (d) Combine variables from UTAUT 2 and TAM frameworks; (e) Testing could be extended to indirect effects; (6) Integrate new variables, such as gender, education, region, or business scale to expand the UTAUT 2 theoretical framework.

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