DINASTI INTERNATIONAL JOURNAL OF ECONOMICS, FINANCE AND ACCOUNTING (DIJEFA)
E-ISSN : 2721-303X
P-ISSN : 2721-3021
https://dinastipub.org/DIJEFA dinasti.info@gmail.com +62 811 7404 455

DOI: https://doi.org/10.38035/dijefa.v5i3
Received: 16 June 2024, **Revised:** 29 June 2024, **Publish:** 15 July 2024

Implementation of QRIS: A Case Study of SMEs in Indonesia

Mohammad Mirza Munthaha[1], Ibnu Aqil[2], Syaikhu Ramadhan Maulana[3], Andi Sri Wahyuni[4], Arinal Muna[5].
[1] Universitas Swadaya Gunung Jati, Cirebon, Indonesia, m.munthaha11@gmail.com.
[2] Universitas Swadaya Gunung Jati, Cirebon, Indonesia, Ibnu.aqil4444@gmail.com.
[3] Universitas Swadaya Gunung Jati, Cirebon, Indonesia, syaikhuramadhan@gmail.com.
[4] University of Szeged, Hungary, wahyuni.andi.sri@o365.u-szeged.hu
Politeknik Negeri Ujung Pandang, Makassar, Indonesia
[5] Universitas Swadaya Gunung Jati, Cirebon, Indonesia, arinalmunaaa@gmail.com.

Corresponding Author: arinalmunaaa@gmail.com.

Abstract: After COVID-19, one of the most widely used payment methods for online purchases is the Indonesian Standard Quick Response Code (QRIS), particularly since Bank Indonesia has accepted it. Utilizing the Innovation Resistance Theory (IRT) approach, which includes two primary components psychological and functional this study aimed to uncover impediments to the adoption of QRIS through the use of usage, value, risk, tradition, and image barriers. SMEs in the food and beverage industry that have implemented QRIS serve as the research's unit of analysis. Ten Majalengka-based food and beverage SMEs participated in in-depth interviews as part of this case study-based qualitative research technique. The study's findings demonstrate that QRIS has benefits that outweight its minor drawbacks for both SMEs and consumers. Large-scale QRIS socialization, optimization, and equitable use are also under the purview of the government.

Keywords: Digital payment, Innovation Resistance Theory (IRT), SMEs, QRIS.

INTRODUCTION

Technology has continued to evolve rapidly in this increasingly sophisticated era (Ting et al., 2016). The pace of technological advancement is so rapid that people often struggle to keep up with the process of learning new technologies. Along with this technological boom is its ability to facilitate economic interactions (Alkhowaiter, 2022; Ramayanti et al., 2023; Ting et al., 2016). Economic transactions can now be done without the seller and the buyer meeting (Junadi & Sfenrianto, 2015). Buyers can now buy what they want from home using their smartphones (Ruslan et al., 2019). The entire process, starting from the search for goods to the payment process, can be done through a smartphone. The payment methods offered also vary, as customers have the option to pay in cash, or with e-money (electric money) (Widayat et al., 2020). Non-cash or cashless payments began to rise during the COVID-19 pandemic

(Kotkowski & Polasik, 2021). Cashless payments were preferred at that time due to the fear of virus transmission from cash payments (Wisniewski et al., 2021).

Such technological advancements should be used to advance the Indonesian economy and help its citizens to prosper. Indonesia has the fourth-highest population worldwide, with 278,553,401 people (as of December 13, 2023) (Worldometer, 2023). The country is also ranked sixth for the highest number of smartphone users worldwide (Syaharani, 2023). Thus, with the considerable number of smartphone users in Indonesia, technological advancements should be used to significantly affect the Indonesian population.

The birth of e-commerce in Indonesia occurred in 1999 with KASKUS, followed by TokoBagus in 2005, and Bukalapak in 2007. Indonesian e-commerce reached its peak in 2015 (Mustajibah, 2021). This development has allowed anyone to open their own stores and sell online. Ridhwan Mustajab also projected the number of online shoppers in Indonesia to be approximately 196.47 million people at the end of 2023 (Mustajab, 2023). Moreover, the Bank of Indonesia recorded the value of e-commerce activities in Indonesia to be Rp476.3 trillion in 2022 (Mustajab, 2023).

In 2014, the Bank of Indonesia planned a National Non-Cash Movement (GNNT) to create a secure, effective, and efficient payment system (Gunawan et al., 2023; Ruslan et al., 2019). Modern digital payments started with e-money or electric money, such as Flazz BCA, BRIZZI, and TapCash BNI (Silvia, 2022). Such payment methods evolved into digital wallets or e-wallets, like GO-PAY issued by Gojek and its rival OVO from Grab (Susilo et al., 2019). In the last few years, almost every store, mall, or small merchant has provided QR Codes as a payment method. Customers will only need to use their smartphones to scan the available QR Codes. Almost all Payment Service Organizers (PJSP) initially had their own QR Code, which could only be used by the PJSP that issued it. However, on August 17, 2019, the Bank of Indonesia and the Association of Indonesian Payment Systems (ASPI) launched the Quick Response Code Standard of Indonesia (QRIS). QRIS was introduced as the national QR Code standard to simplify QR code payments in Indonesia (InterActive, 2019). QRIS is an assembly of QR codes from different Payment System Service Organizers (PJSP) that distribute QR code (Bank Indonesia, 2019b). QRIS enables SMEs to only provide one QR code for their consumers (Surekha et al., 2015). The government issued a policy of obligation to use QRIS for payments facilitated with QR codes (Bank Indonesia, 2019a). Due to this government policy, SMEs are supposed to start using QRIS as a QR code payment. However, many still find it challenging to implement this new technology.

Some SMEs have not adopted QRIS for several reasons, such as security issues, cuts in each transaction that may reduce their income, and other factors (Nada et al., 2021). However, a previous study found that more widespread QRIS usage will increase Indonesia's economic income (Nada et al., 2021). Therefore, this study aims to determine the extent to which SMEs understand QRIS to help increase the use of QRIS and boost Indonesian economic growth (Musyaffi et al., 2024).

The researchers used the Innovation Resistance Theory (IRT) as it can measure the level of resistance on two sides: active and passive (Musyaffi, Gurendrawati, et al., 2022). According to Ram and Sheth (1989), the Innovation Resistance Theory (IRT) is a concept that explains people's resistance to adapting to the latest technological innovations. It aims to understand why people hesitate to accept an innovation or new technology. The IRT is divided into physiological and functional dimensions (Eriksson et al., 2021). These two dimensions can be further divided into several barriers. The physiological dimension is divided into the image and tradition barriers (Musyaffi, Gurendrawati, et al., 2022). The functional dimension is divided into three barriers: usage, value, and risk barriers (Eriksson et al., 2021; Ram & Sheth, 1989). The IRT explains the user's response to anything related to these constraints (Kaur et al., 2020).

Previous literature has also explained that IRT is the suitable method used to examine the extent of user resistance to digital payments (Kaur et al., 2020).

First, usage barrier. According to Musyaffi, Gurendrawati, et al. (2022) and Talwar et al. (2021) obstacles to use will materialize if the factors surrounding the innovation of a technical product or service differ from the circumstances, experiences, and values of consumers that determine user convenience. Eriksson et al., (2021) and Laukkanen & Kiviniemi, (2010) had a similar view about the challenges associated with comprehending and applying novel technical innovations. Users will require more time to adjust to and utilize this technological innovation because it is a complex problem if it has never been encountered before (Lian & Yen, 2014; Musyaffi, Gurendrawati, et al., 2022; Talwar et al., 2021). Users refuse to use new technology because it does not fit their needs, experiences, and habits (Chen et al., 2022; Kaur et al., 2020). This barrier focuses on the extent to which the consumers know about QRIS.

Second, value barrier. A person's reluctance to learn about a technology product that has been improved to be "more useful" is explained by the value barrier. This is shown when there is a discrepancy between the benefits consumers receive and the expenditures associated with using them (Kaur et al., 2020; Morar, 2013; Musyaffi, Gurendrawati, et al., 2022) In the long run, users will be more interested in learning about and even utilizing the innovative product if it offers higher value or benefits (Kaur et al., 2020; Musyaffi, Gurendrawati, et al., 2022) relative to the costs paid (de Luna et al., 2019; Eriksson et al., 2021). Payments using cell phones are among the technological developments that people in Indonesia find quite popular (Susilo et al., 2019), as is QRIS (Bank Indonesia, 2019b). This will also affect the likelihood that this payment innovation will be adopted; the higher the benefits from technical innovation, the higher the likelihood (Arvidsson, 2014; Eriksson et al., 2021; Mallat, 2007; Oliveira et al., 2016). Thus, this barrier centers on the value that QRIS offers in comparison to other options (C. C. Chen et al., 2022).

Third, risk barrier. Technology innovations are inextricably linked to risks. According to a number of academic works (P. T. Chen & Kuo, 2017; Musyaffi et al., 2021; Musyaffi, Gurendrawati, et al., 2022; Talwar et al., 2021), consumers will find this risk to be a barrier, which may naturally cause them to be less inclined to utilize the technology (Talwar et al., 2021). Security and privacy with regard to financial data and information is one type of risk that might eventually become resistant (Musyaffi et al., 2021; Musyaffi, Gurendrawati, et al., 2022; Talwar et al., 2021). Users of this cutting-edge product need sufficient security, which includes QRIS and mobile payments. More people will inevitably be willing to adopt a technology if it is safer (Musyaffi et al., 2021; Singh & Srivastava, 2018). Therefore, it is not unexpected that the topic of mobile payment research that has received the greatest attention is risk barriers (Dahlberg et al., 2015; Eriksson et al., 2021). When implementing new technology, security concerns play a significant role (Kaur et al., 2020; Musyaffi, Gurendrawati, et al., 2022). Through this barrier, MSME participants will be able to determine the security level of QRIS.

Fourth, tradition barrier. Tradition is inextricably linked to social life. The success of a variety of things, including goods, services, and technology, can also be determined by the existence of this tradition (Kaur et al., 2020; Musyaffi, Gurendrawati, et al., 2022). When new goods interfere with people's everyday routines, they can represent a barrier to innovation, especially if the routine is significant to the users (Eriksson et al., 2021; Laukkanen et al., 2009). According to Arvidsson (2014) and Musyaffi, Gurendrawati, et al. (2022), traditional obstacles pose a substantial challenge to the adoption of innovative products, including the deployment of digital payments. Changing one's behaviors to accommodate new technologies presents an intriguing challenge. This barrier can account for the degree to which users adjust to shifting behaviors, such as switching from using paper money to non-cash payment methods (QRIS) (Kaur et al., 2020; Sivathanu, 2019).

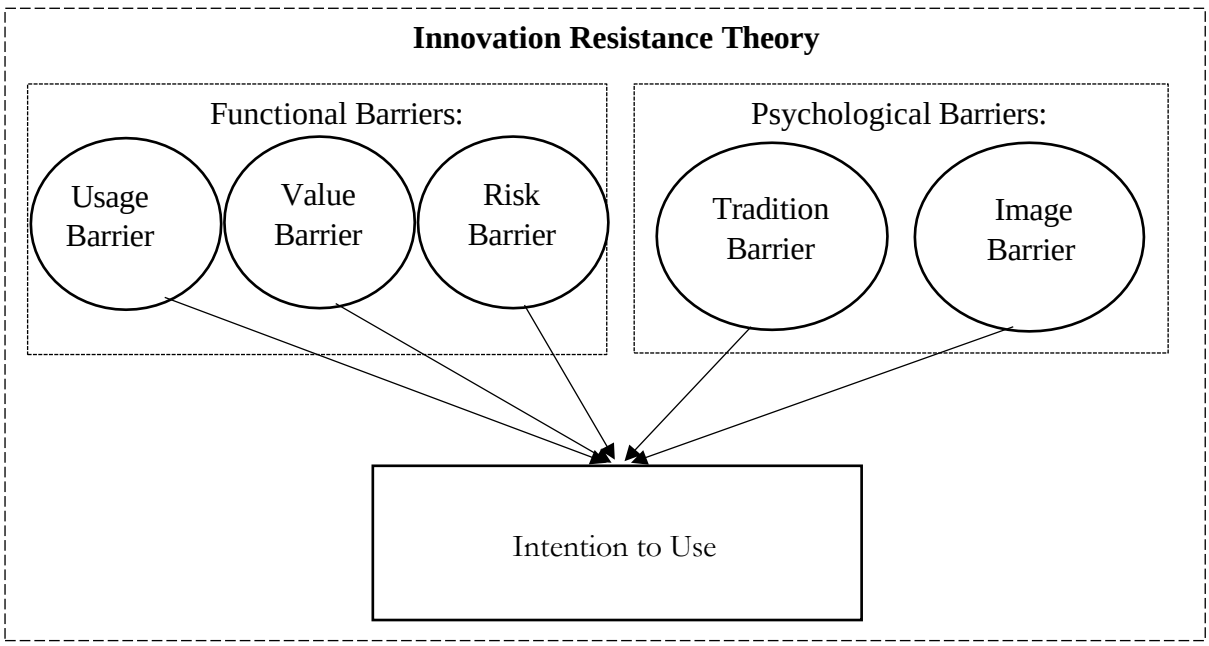
Fifth, image barrier. According to Hayashi (2012) Kaur et al. (2020) and Musyaffi, Gurendrawati, et al. (2022), this image barrier arises when a product consumer perceives themselves as insecure, which leads to a bad image. On the other hand, users' expectations about the technology's performance will rise as they reap the rewards of technological innovation (Musyaffi, Gurendrawati, et al., 2022; Zhou et al., 2010). The image of the company that develops the innovation is an important factor in technology adaptation (Kaur et al., 2020). Users will be less likely to employ the technology if the company has a negative reputation (C. C. Chen et al., 2022).

This research was conducted to build on previous research by Musyaffi, Gurendrawati, et al. (2022), which investigated the resistance of SMEs who sold clothes to digital payments (Musyaffi, Gurendrawati, et al., 2022). In this study, the researchers also wanted to investigate QRIS development in SMEs. The researchers used the innovation resistance theory to explore the extent to which SMEs know about QRIS. A qualitative approach was used through interviews, focusing on food and beverage SMEs' resistance to QRIS use.

METHOD

This study adopted a qualitative case study methodology through interviews with SMEs actors. The interview process allowed the researcher to obtain deeper information about the object under study (Stefánsdóttir et al., 2022). As explained by Agresti (2006) in the introduction to qualitative data processing, interview results should reflect people's attitudes toward an event. The resulting data cannot be calculated, measured, or expressed as numbers (Nowak et al., 2023).

This research targeted food and beverage SMEs that use QRIS as one of their payment methods. This study was conducted in a small town in West Java, Majalengka. The SMEs studied have been in business for at least one year. A total of 10 SMEs were interviewed in this study. The interviews were conducted directly for approximately 30 minutes. After being audio recorded, the interview procedure was transcribed. Based on the respondents' positions, length of business, and usage of QRIS in their operations, researchers mapped the respondents. For qualitative approaches, interactive model analysis was selected in this study. Additionally, Miles et al. (2013) and Musyaffi, Gurendrawati, et al. (2022) clarify that this methodology starts with field data collecting, followed by the selection and presentation of the data, verification in discussions, and conclusion drafting.



Source: Modified from C. C. Chen et al. (2022) and Kaur et al. (2020)

Figure 1. Research Models

The research model employed was adopted by Chen et al., (2022) and Kaur et al., (2020) with minor adjustments. Meanwhile, the IRT research model measured how functional and psychological limitations or resistance impact QRIS user behaviour.

RESULTS AND DISCUSSION

Results

This research interviewed a total of 10 SMEs. They have all used QRIS, are in the food and beverage sector, and have been operational for approximately one year. Unfortunately, not all of those interviewed were the owners of these SMEs. Instead, they were managers, baristas, and waiters aged between 20 and 40 years old. Nevertheless, they were still able to provide sufficient information. Then, the interview process started on February 16, 2024. However, it was disrupted on the 20th and 21st due to SMEs' refusal to participate. During those two days, the researcher asked the SMEs about other SMEs that could be interviewed and asked them about their willingness to participate in the study. The interview process resumed on the 22nd and 23rd. The duration of the interview varied from 5 minutes to 30 minutes. Table 1 exhibits the interview questions used.

Table 1. Questions list

Topic	Questions
Introduction	The researcher asked about the informant's profile, such as name, position and when they started doing business.
Usage Barrier	How do you make a QRIS? Since when have you used QRIS? Did you previously use digital payments using the QR Code? What bank account or e-wallet does the QR code use in the transaction originate from?
Value Barrier	What are the advantages and disadvantages of QRIS for you as an SMES? Are there any deductions? Does it burden you?
Risk Barrier	Has there ever been a problem when using QRIS? If so, what was the problem like and how did you solve it? Can the internet connection and devices used by consumers hinder payments?
Tradition Barrier	Do more consumers pay with QRIS or cash? What is the ratio between QRIS and cash payments? Does the money go directly into the account?
Image Barrier	What are your considerations for using QRIS? Did you receive confirmation if the payment has been made? If QRIS was not launched by Bank Indonesia, would you still use it?

Source: Modified from Eriksson et al. (2021) and Musyaffi, Gurendrawati, et al. (2022). Considering it is specific to the topic under discussion—QRIS adoption—the researcher has made modifications to this query.

As an opening question (Table 1), the researcher asked about the interviewee's profile, such as name, position, and the business year of establishment. A total of 4 owners, 4 managers, 1 barista, and 1 waiter were the interviewees during the interview process. All SMEs surveyed have been in business for more than one year.

Table 2. Informants list

No	Pseudonym	Initial	As a/an	Year of Establishment
1	Informant 1	I1	Owner	2019
2	Informant 2	I2	Barista	2019
3	Informant 3	I3	Manager	2019
4	Informant 4	I4	Manager	2022
5	Informant 5	I5	Owner	2016
6	Informant 6	I6	Waiter	2020
7	Informant 7	I7	Manager	2016
8	Informant 8	I8	Owner	2014
9	Informant 9	I9	Manager	2023
10	Informant 10	I10	Owner	2021

Source: Research Data (2024)

Usage Barrier

The adoption of QRIS payments by SMEs, knowledge of QRIS payments, and fragmentation are the primary factors contributing to the usage barrier. Eriksson et al. (2021) and Musyaffi, Gurendrawati, et al. (2022) also reviewed these three topics. Then, these primary ideas were condensed into a few queries, such as the process of making QRIS, when they started using QRIS, and their experience before using QRIS. The results revealed that all SMEs used QRIS with banking intermediaries, and none used digital wallets as their business accounts. Banking intermediaries are preferred because the funds deposited into a QRIS account can be withdrawn via an ATM. A savings book is sufficient for an individual to obtain a QRIS (I1). If the individual does not have a bank account, they must first create one and prepare requirements such as a KTP (Indonesian Identity Card), KK (Family Card), e-mail, and others (I10). Conversely, withdrawing funds from a digital wallet is a longer process that requires individuals to meet specific criteria.

Before using QRIS, none of the interviewed SMEs used QR code payments from OVO, Go-pay, or other platforms. However, almost all SMEs (except I10) have used digital payments before through EDC machines. The SMEs that had been established prior to the implementation of QRIS (I1, I2, I3, I5, I7, and I8) promptly adopted the QRIS once the policy from Bank Indonesia governing QRIS commenced. The SMEs established after the implementation of QRIS (I4, I6, I9, and I10) have adapted diverse strategies to adjust to this new technology. Interviewees 4 and 6 explained that the person who took care of making the QRIS was the owner. Meanwhile, I10 obtained sponsorship from the bank. Thus, the bank concerned prepared all the requirements for making QRIS. Interviewee 9 explained that because his business has its own system that is not integrated with any bank, "*The money that comes in will be stored in the payment gateway system, which can then be transferred to a personal account*."

The proliferation of various payment methods indicates a fragmentation in the market. This differentiation in payment options compels merchants to adopt systems like QRIS to effectively meet the diverse needs of consumers.

"*The reason for using QRIS is because payment methods have become more varied*." (I5)

Value Barrier

Value barrier refers to two primary concepts: relative advantage and incentive. Relative advantage describes a condition where digital payments are perceived to be more practical and flexible than physical payments (Eriksson et al., 2021; Musyaffi, Gurendrawati, et al., 2022).

When individuals prefer physical payments, this preference constitutes a barrier to the adoption of digital payments, particularly QRIS, especially for those who have never used it. However, based on respondents' feedback, many recognize the benefits of adopting QRIS, with several noting the ease of the payment process..

"*Payments are more practical because we are now in an all-digital era.*" (I3, I4, I7, I8, I9)

"*The funds go directly to the owner*." (I2)

"*It's simple. And there is no need to provide change, as it can be hard to find smaller denominations.*" (I1, I5, I6, and I10)

However, empirical evidence also indicates the existence of value barriers, as expressed by several respondents. The following are the shortcomings of QRIS mentioned by the interviewees:

"*There are frequent interruptions when making payments at certain hours, such as 9 pm to midnight*." (I1, I3, I6, I7, and I10)

"*We don't have cash when shopping for ingredients for tomorrow, because no one provides QRIS as a payment option at the (traditional) market. So, we have to make a withdrawal to the ATM first*." (I2, I5)

"*The money does not come in real-time. There is a delay of several hours depending on the bank used*." (I8, I10)

"*Issues may develop when there are internet problems or if the customer's smartphones malfunction. These instances cause them to fail to complete the payment through QRIS.*" (I4, I9)

Informant 1 added that QRIS does not have a minimum payment amount limit, which makes it more flexible and efficient than cash. According to InterActive (2019), QRIS does not have a minimum transaction limit, which can start from Rp1,- to a maximum of Rp20.000.000,- (Interactive, 2023).

Risk Barrier

Two critical aspects of the risk barrier are user-perceived security and user dependence on technological innovation (Eriksson et al., 2021; Musyaffi, Gurendrawati, et al., 2022). Several respondents indicated the issues that occur when using QRIS and their matching solutions. Informants 2, 5, and 9 have not encountered any issues, such as network disruption or incorrect payment amount input. They stated, "*Consumers who use QRIS already understand how to use QRIS and are careful when making transactions. When they see QRIS installed in front of the cashier, they take the initiative to pay using QRIS.*"

Despite the impact of QRIS on user dependency, it remains susceptible to numerous obstacles. The other seven informants experienced various problems. Some customers made more than one payment because the payment did not go through to the SMES (I1, I4, and I6), disruptions from 9 to 12 pm (I1, I2, I7, and I10), incorrect input of payment amounts (I1 and I8), and cases where the customers' money had been deducted but the SMEs had not received it (I3, I7, and I8).

"*A person once made two payments because we did not receive the money, but the customer's balance had been deducted. They even made payments with 2 different banks. So, the payment was paid in cash and the consumer initiated the refund process with the problematic bank. There was even a process that took up to one month*." (I1)

Informant 1 also said, "*Lately, we've been experiencing problems frequently, whereas before it was safe. There are often interruptions at 9 pm, or when there is a promo that causes too many transactions.*"

According to informant 7, "*Disruptions occur at 10 pm, and during the middle and end of the month. Other issues include long loading times when making a payment or the application suddenly logging out itself which causes the customer's balance to be deducted, even though we have not received the money. There have also been cases where funds arrive after 3 working days. The time it takes for the refund process varies. If you use a digital wallet, you can get a refund immediately. Banks take a longer process. Some take up to 20 working days before a refund can be made.*"

Moreover, the problem of inputting the wrong payment amount was often experienced by informants 1 and 8.

"*There is often an error in inputting the payment amount. If there is an overage, a refund will be made in cash or transfer. If it is lower than the payment amount, the customer will be notified and asked to pay the shortfall*."

Informant 10 also explained a different problem.

"*The problem can also be from the customer's side as sometimes their mobile phone cannot scan QRIS. Sometimes you have to use a flashlight to scan it. If it is still unable to do so, then it will be transferred to my account. A further issue happens when transferring QRIS balances to personal accounts. There are often delays or maintenance at 9 pm.*"

Tradition Barrier

Old habits and transition costs are two significant elements within the tradition barrier. The researcher inquired about the method for accessing the QRIS balance, verifying incoming payments, and comparing customers' use of cash and QRIS for payments. Based on field data, all respondents have demonstrated a tendency to adhere to their existing transactional habits, albeit without entirely forsaking them. All informants currently use the banking applications they work with to see their QRIS balance. Likewise, they receive confirmation of payments that have come in through bank applications, emails (I10), and SMS (I5). The results vary when comparing the number of consumers who make payments with cash and QRIS. As many as 5 informants have more QRIS users than cash (I3, I4, I7, I8, and I9), and 4 interviewees receive more cash payments than QRIS (I1, I2, and I6). Informant 5 also made the following statement:

"*The ratio of QRIS and cash users depends on the date of the transaction. At the beginning of the month, most consumers pay with QRIS, with a ratio of around 70:30. If it is the end of the month, the ratio is 50:50.*"

This opinion is inversely proportional to Informant 10,

"*The comparison is not exact, it depends on the date. At the beginning of the month, most people pay with cash, and usually in large denominations. So, we sometimes have difficulty finding change. When entering the end of the month, the number of QRIS users increase, but there are still more who use cash, 70:30.*"

The following is comparative data on QRIS and cash users from each SMES (Table 3).

Table 3. Users percentages

Name	Users Percentages	
	QRIS	Cash
I2	10%	90%
I6	30%	70%
I10	30%	70%
I1	40%	60%
I3	60%	40%
I5	*60%	**40%

I8	60%	40%
I4	70%	30%
I7	70%	30%
I9	70%	30%

*) 60% = [(70+50)/2]/100
**) 40% = [(30+50)/2]/100
Source: Research Data (2024)

Informant 1 explained that there was an increase in QRIS users, although there were still more who used cash. "*At the beginning of QRIS, Majalengka people seldom used it. There were still more people who used cash. In 2021, there were also still more customers who used debit or credit cards than QRIS*," he explained.

The increase in QRIS users was also observed by informant 8, who explained, "*The comparison of QRIS and cash users is now around 60:40, with more QRIS users. Previously, more customers paid in cash. It may be because the socialisation has not been evenly distributed and users have not really felt the benefits*."

The adoption of QRIS naturally entails an impact on switching costs, manifested through discounts offered to merchants on received funds or additional fees imposed on customers. The interviewees provided varying responses when questioned about deductions in QRIS transactions. Some are subject to deductions (I1, I7, I8, I9, and I10) and some are not (I2, I3, I4, I5, and I6). These variations are due to different bank policies. Some deductions are charged to the SMEs (I1, I8, and I10), and some are charged to the consumers (I7 and I9).

"*Previously, there was no deduction, up until mid-2023, because we received an award from Bank Indonesia. After that, there is a deduction of 0.2% in every transaction, which is charged to us, as an SME.*" (I1)

"*Now, 0.3% per transaction is charged to SMEs. It is not much, but if accumulated, the deduction will feel big. Whereas before there were no deductions.*" (I8)

"*The deduction varies, depending on the transaction value. The bigger the transaction amount, the bigger the deduction. For example, if the transaction is IDR10,000, the money that comes in is only IDR9,900.*" (I10)

"*QRIS transactions below Rp100,000.00 are not subject to deductions. For transactions above Rp100,000.00, a deduction of 0.3% is charged to consumers.*" (I7)

"*There is a 1% deduction per transaction that is charged to the customer.*" (I9)

Image Barrier

Two fundamental questions lie at the heart of the image barrier: perceptions of service providers and the need for external approval (Eriksson et al., 2021; Musyaffi, Gurendrawati, et al., 2022). These critical factors were subsequently distilled into inquiries regarding SMEs' consideration of using QRIS and whether they will continue to use QRIS even though there is no policy from Bank Indonesia. All interviewees agreed that they would continue to use QRIS even without a policy from Bank Indonesia. The informants stated that they considered QRIS' effectiveness (I1, I4 and I5), keeping up with the times (I1, I2 and I3), security (I6, I7, I8 and I10) and the demand from customers (I10).

"*We use QRIS because it is simpler, more effective (than cash), and makes the payment method to be more varied*." (I5)

"*The development of the times allows payments to be made digitally, one of which is QRIS*." (I3)

"*The most important thing is that security is guaranteed and that the consumer's money will definitely go to our QRIS account*." (I7 and I10)

"*To ensure its function, we conduct validation first before QRIS is used for consumers. If a problem is found, it will be repaired, and we will report it to the bank concerned*." (I8)
"*Previously, there were also many customers who often asked whether they could make the payment through QRIS or not. If you don't use QRIS, it's like you're not keeping up with the times*." (I10)

Discussion

This study aimed to obtain insight from SMEs that have used QRIS. The researcher used the Innovation Resistance Theory (IRT) to ascertain the SMEs' level of knowledge on QRIS and their experience with five barriers related to technology adoption. The following text provides an overview of the interview findings that can accurately depict the general sentiment of SMEs about QRIS.

Table 4. Summary

Barrier in IRT	Identified Themes	Items of Concern
Usage Barrier	QRIS Adoption	All merchants have adopted QRIS
	QRIS Literate	All merchants know how to use QRIS
	Fragmentation	1. All merchants utilize QRIS as a payment method. 2. Nearly all QRIS transactions conducted by merchants involve various banking intermediaries. 3. One merchant uses QRIS through a payment gateway specifically created for that merchant.
Value Barrier	Relative Advantage	Practical and no need to give change
	Incentive	QRIS doesn't have minimum limit and maximum to Rp20.000.000,-
Risk Barrier	Perceive Security	1. SMEs conduct a validation process prior to implementing QRIS to identify potential obstacles. 2. Identified obstacles are subsequently addressed through consultations with the bank
	Reliance on QRIS	1. Issues that arise are primarily due to network disruptions and human error. 2. QRIS is utilized only upon customer request
Tradition Barrier	Old Habits	1. Comfortable using QRIS 2. New habits include checking notifications and account mutations.
	Switching Cost	There is fee for making QRIS and it has deduction on every transactions
Image Barrier	Image of Service Providers	As long as the company is trusted
	Need of Others' Approval	Each transaction triggers an immediate notification, thereby eliminating the necessity for approval from additional parties.

Source: Research data (2024) and Modified from Eriksson et al. (2021) and Musyaffi, Gurendrawati, et al. (2022).

Based on the findings, barriers to the utilization of QRIS appear to be related to three primary themes: adoption, knowledge, and fragmentation within the QRIS system. All respondents indicated that they had adopted QRIS following the issuance of the Bank Indonesia policy in 2019. QRIS payments are distinguished from other payment methods by their unique and appealing nature. Both customers and merchants find this payment method intriguing, as the transaction is completed simply by scanning the barcode with a device and entering a PIN. Various means exist to obtain a QR code, including mobile banking and e-wallet services. From a merchant's perspective, the most flexible and reliable QR codes are those connected to banking institutions. Small and Medium Enterprises (SMEs) can acquire a QR code merely by providing a savings book (I1). The presence of an official savings book offers a guarantee for verifying transactions, facilitating ease of use for individuals when addressing issues that may require further communication, such as transaction errors.

Withdrawing funds from QRIS transactions linked to bank accounts is notably more straightforward than e-wallets, which involve a lengthy process and require individuals to meet specific criteria. Each SME utilizes QRIS from various banks, such as Bank BJB, BCA, BTN, Mandiri, and BRI (I1, I2, I3, I4, I5, I7, I8, and I10), as well as from payment gateways with customized systems for SMEs that are not connected to any banks (I9). The variability in QR code sources employed by SMEs results in a fragmentation in their use of QRIS. This indicates that QRIS can be utilized via any mobile banking application, extending beyond traditional banks to include e-wallets. The user-friendly nature of QRIS means that SMEs do not require prior experience with QR Code payments to adopt QRIS. Digital payments are deemed suitable by SMEs when users perceive the system as easy to use (Haddara et al., 2021; Musyaffi, Johari, et al., 2022; Thathsarani & Jianguo, 2022).

The findings additionally revealed that two themes—relative advantage and incentives—are associated with value barriers. The implementation of QRIS significantly benefits SMEs by making payments practical and straightforward, eliminating the need to provide change during transactions. Despite these advantages, there are obstacles, such as delays in payment processing, where funds do not enter their accounts in real-time due to dependencies on the specific banks used by SMEs and consumers (I8 and I10). The transaction process is expedited if both the SME and the consumer use the same bank. Network disruptions, occurring at certain times, also render QRIS unusable (I1, I3, I6, I7, and I10). Furthermore, SMEs using QRIS often lack the cash needed to purchase ingredients at traditional markets, as traditional market traders typically do not accept QRIS payments (I2 and I5). These barriers can influence the adoption of technology (Arvidsson, 2014).

Conversely, the additional value perceived by customers and SMEs in using QRIS is notable. One significant incentive for adopting QRIS is the absence of a minimum transaction limit and a relatively high maximum transaction limit of IDR 20,000,000. This aligns with the findings of Dubey & Sahu (2021) and Lin et al. (2020), which suggest that individuals are likely to respond positively to incentives provided by service providers. The adoption of this technology can enhance the operational processes of companies (Khayer et al., 2020; Ooi et al., 2018), thereby accelerating business processes through digital payments (Musyaffi et al., 2024).

The next topics to consider within the context of risk barriers are security and reliance on QRIS. SMEs prioritize the security and reliability of QRIS transactions (I7 and I10) by conducting validation procedures before QRIS is utilized by customers (I8). This validation process helps identify potential issues, which are then addressed in consultation with the banking sector (I8). This approach aligns with research indicating that security plays a crucial role in technology adoption (Alexandrou & Chen, 2021; de Kerviler et al., 2016; Kaur et al., 2020; Musyaffi et al., 2021; Talwar et al., 2021).

Transactions using QRIS are perceived as simpler since individuals do not need to carry cash, and SMEs are relieved from the burden of providing change. Consequently, QRIS is highly favored by its users. However, the success rate of transactions can sometimes be hindered by network issues and human error, affecting user dependence on QRIS. For instance, customers' balances may be deducted without the seller receiving the funds, necessitating cash payments from customers (I1). Transaction disruptions frequently occur during peak times, such as 9-10 PM, mid-month, month-end, and during promotional events (I1 and I10). Additionally, technical problems with customers' devices, such as smartphones that cannot scan QR codes or incorrect input of payment amounts, can also arise (I1 and I8). Proper QRIS scanning requires adequate lighting and compatible devices (I10). These issues are consistent with findings by Najib & Fahma (2020), who confirmed delays in receiving funds and transaction failures due to unstable connections. Despite these challenges, merchants continue

to offer QRIS payments, though SMEs do not compel customers to use them. Customers often choose to use QRIS on their own initiative when they see a QR code displayed at the cashier.

Tradition and image barriers are influenced by established habits, switching costs, the image of the service provider, and the need for approval from others. The introduction of QRIS fosters new transactional habits. Traditionally, transactions involved physically counting and exchanging money. In contrast, QRIS transactions require customers and SMEs to engage with smartphones, banking applications, and transaction success notifications via app payment proofs, email, and SMS. Additionally, verifying the merchant's received balance or the customer's deducted balance is crucial in digital payments. Research findings indicate that 6 out of 10 respondents prefer using QRIS over cash, while the remaining 4 respondents still favor cash transactions. This demonstrates an increasing openness among QRIS users to technological innovation, as they experiment with QRIS for several transactions. Both parties perceive benefits, aligning with related research suggesting that technology offers more impactful advantages than traditional methods (Eneizan et al., 2019; Ibrada et al., 2020; Musyaffi, Sulistyowati, et al., 2022; Tamilmani et al., 2021).

Despite the appeal of this technology, there are costs associated with using QRIS. Fees for QRIS usage by SMEs range from 0.2% to 1%, which can be borne by the SMEs themselves or passed on to the customer (I1, I7, I8, I9, and I10). However, these switching costs do not pose significant issues for customers and merchants. QRIS maintains a positive image among its users, with research indicating that SMEs will continue to use QRIS due to its simplicity and effectiveness (I5), alignment with current developments (I3 and I10), and customer demand (I10). All respondents expressed willingness to use QRIS even in the absence of a policy mandate from Bank Indonesia, indicating that the adoption of QRIS does not require external approval. Overall, SMEs are satisfied with QRIS usage. Musyaffi et al. (2024) further noted that digital payments can reduce costs economically, as customers do not need to withdraw cash from ATMs or branch offices for purchases.

CONCLUSION

This study, with the assistance of Innovation Resistance Theory (IRT), shows the barriers of SMEs adopting QRIS from the psychological and functional dimensions. From the functional dimension (usage, value, and risk), the researcher found 7 themes of concern in adopting QRIS with some modification from Eriksson et al. (2021) and Musyaffi, Gurendrawati, et al. (2022). It was found that QRIS is understood by all SMEs (who became informants) and has more benefits than other alternatives. Because QRIS is more practical and merchants do not need to give change. Problems can also be prevented, as SMEs do a trial and error first before QRIS can be used for consumers. However, network disruptions and human error are also obstacles when using QRIS. On the psychological dimension, there is one difference in tradition barrier from previous research (Eriksson et al., 2021; Musyaffi, Gurendrawati, et al., 2022). This time, merchants are more comfortable using digital payment (QRIS) rather than cash. Consumers are also more likely to use QRIS. Unfortunately, the deductions in each transaction are quite burdensome and become a shortcoming of QRIS.

With the many benefits that merchants get, it should be able to cover up the minor shortcomings. Sellers and buyers also feel QRIS' advantages. The problems that occur can still be overcome with appropriate solutions. Nevertheless, it depends on the SMEs on whether they want to adopt the QRIS. It is also the government's job to socialize QRIS on a larger scale and eliminate deductions in every transaction so that all SMEs can embrace its use.

REFERENCE

Agresti, A. (2006). An Introduction to Categorical Data Analysis: Second Edition. In *An Introduction to Categorical Data Analysis: Second Edition*.

https://doi.org/10.1002/0470114754

Alexandrou, A., & Chen, L. C. (2021). Correction to: A security risk perception model for the adoption of mobile devices in the healthcare industry (Security Journal, (2019), 32, 4, (410-434), 10.1057/s41284-019-00170-0). *Security Journal*, *34*(2), 261. https://doi.org/10.1057/s41284-019-00223-4

Alkhowaiter, W. A. (2022). Use and behavioural intention of m-payment in GCC countries: Extending meta-UTAUT with trust and Islamic religiosity. *Journal of Innovation and Knowledge*, *7*(4), 100240. https://doi.org/10.1016/j.jik.2022.100240

Arvidsson, N. (2014). Consumer attitudes on mobile payment services - results from a proof of concept test. *International Journal of Bank Marketing*, *32*(2), 150–170. https://doi.org/10.1108/IJBM-05-2013-0048

Bank Indonesia. (2019a). Peraturan Anggota Dewan Gubernur Nomor 21/ 18 /Padg/2019 Tentang Implementasi Standar Nasional Quick Response Code Untuk Pembayaran. *Bank Indonesia*, 1–30.

Bank Indonesia. (2019b). *QRIS*. Bi.Go.Id. https://www.bi.go.id/QRIS/default.aspx

Chen, C. C., Chang, C. H., & Hsiao, K. L. (2022). Exploring the factors of using mobile ticketing applications: Perspectives from innovation resistance theory. *Journal of Retailing and Consumer Services*, *67*(December 2021), 102974. https://doi.org/10.1016/j.jretconser.2022.102974

Chen, P. T., & Kuo, S. C. (2017). Innovation resistance and strategic implications of enterprise social media websites in Taiwan through knowledge sharing perspective. *Technological Forecasting and Social Change*, *118*, 55–69. https://doi.org/10.1016/j.techfore.2017.02.002

Dahlberg, T., Guo, J., & Ondrus, J. (2015). A critical review of mobile payment research. *Electronic Commerce Research and Applications*, *14*(5), 265–284. https://doi.org/10.1016/j.elerap.2015.07.006

de Kerviler, G., Demoulin, N. T. M., & Zidda, P. (2016). Adoption of in-store mobile payment: Are perceived risk and convenience the only drivers? *Journal of Retailing and Consumer Services*, *31*, 334–344. https://doi.org/10.1016/j.jretconser.2016.04.011

de Luna, I. R., Liébana-Cabanillas, F., Sánchez-Fernández, J., & Muñoz-Leiva, F. (2019). Mobile payment is not all the same: The adoption of mobile payment systems depending on the technology applied. *Technological Forecasting and Social Change*, *146*(September), 931–944. https://doi.org/10.1016/j.techfore.2018.09.018

Dubey, P., & Sahu, K. K. (2021). Students' perceived benefits, adoption intention and satisfaction to technology-enhanced learning: examining the relationships. *Journal of Research in Innovative Teaching and Learning*, *14*(3), 310–328. https://doi.org/10.1108/JRIT-01-2021-0008

Eneizan, B., Mohammed, A. G., Alnoor, A., Alabboodi, A. S., & Enaizan, O. (2019). Customer acceptance of mobile marketing in Jordan: An extended UTAUT2 model with trust and risk factors. *International Journal of Engineering Business Management*, *11*, 1–10. https://doi.org/10.1177/1847979019889484

Eriksson, N., Gökhan, A., & Stenius, M. (2021). A qualitative study of consumer resistance to mobile payments for in-store purchases. *Procedia Computer Science*, *181*(2019), 634–641. https://doi.org/10.1016/j.procs.2021.01.212

Haddara, M., Gøthesen, S., & Langseth, M. (2021). Challenges of Cloud-ERP Adoptions in SMEs. *Procedia Computer Science*, *196*(2021), 973–981. https://doi.org/10.1016/j.procs.2021.12.099

Hayashi, F. (2012). Mobile Payments: What's in It for Consumers? *ECONOMIC REVIEW*, 35–66.

Ibrada, A. S., Mulyani, S., Winarningsih, S., & Farida, I. (2020). User competency as an

important factor for the success of AIS implementation: empirical study of the systems in distribution of subsidised fertilisers in Indonesia. *Talent Development & Excellence*, *12*, 3012–3025.

Interactive. (2023). *BI Naikkan Lagi Limit Transaksi QRIS Jadi Rp 20 Juta*. https://qris.online/homepage/qris-news-detail?page=45-bi-naikkan-lagi-limit-transaksi-qris-jadi-rp-20-juta

InterActive. (2019). *Tentang InterActive QRIS*. Qris.Online. https://qris.online/homepage/about#:~:text=Apa itu QRIS%3F,ASPI) pada 17 Agustus 2019.

Junadi, & Sfenrianto. (2015). A Model of Factors Influencing Consumer's Intention to Use E-payment System in Indonesia. *Procedia Computer Science*, *59*(Iccsci), 214–220. https://doi.org/10.1016/j.procs.2015.07.557

Kaur, P., Dhir, A., Singh, N., Sahu, G., & Almotairi, M. (2020). An innovation resistance theory perspective on mobile payment solutions. *Journal of Retailing and Consumer Services*, *55*(April), 102059. https://doi.org/10.1016/j.jretconser.2020.102059

Khayer, A., Talukder, M. S., Bao, Y., & Hossain, M. N. (2020). Cloud computing adoption and its impact on SMEs' performance for cloud supported operations: A dual-stage analytical approach. *Technology in Society*, *60*, 101225. https://doi.org/10.1016/j.techsoc.2019.101225

Kotkowski, R., & Polasik, M. (2021). COVID-19 pandemic increases the divide between cash and cashless payment users in Europe. *Economics Letters*, *209*, 110139. https://doi.org/10.1016/j.econlet.2021.110139

Laukkanen, T., & Kiviniemi, V. (2010). The role of information in mobile banking resistance. *International Journal of Bank Marketing*, *28*(5), 372–388. https://doi.org/10.1108/02652321011064890

Laukkanen, T., Sinkkonen, S., & Laukkanen, P. (2009). Communication strategies to overcome functional and psychological resistance to Internet banking. *International Journal of Information Management*, *29*(2), 111–118. https://doi.org/10.1016/j.ijinfomgt.2008.05.008

Lian, J. W., & Yen, D. C. (2014). Online shopping drivers and barriers for older adults: Age and gender differences. *Computers in Human Behavior*, *37*, 133–143. https://doi.org/10.1016/j.chb.2014.04.028

Lin, K. Y., Wang, Y. T., & Huang, T. K. (2020). Exploring the antecedents of mobile payment service usage: Perspectives based on cost–benefit theory, perceived value, and social influences. *Online Information Review*, *44*(1), 299–318. https://doi.org/10.1108/OIR-05-2018-0175

Mallat, N. (2007). Exploring consumer adoption of mobile payments - A qualitative study. *Journal of Strategic Information Systems*, *16*(4), 413–432. https://doi.org/10.1016/j.jsis.2007.08.001

Miles, M. B., Huberman, A. M., & Saldana, J. (2013). *Qualitative Data Analysis: A Methods Sourcebook*. SAGE Publications.

Morar, D. D. (2013). An overview of the consumer value literature – perceived value, desired value. *6th Edition of the International Conference "Marketing - from Information to Decision," January*, 169–186. https://www.academia.edu/10448005/An_overview_of_the_consumer_value_literature_perceived_value_desired_value

Mustajab, R. (2023). *Pengguna E-Commerce RI Diproyeksi Capai 196,47 Juta pada 2023*. DataIndonesia.Id. https://dataindonesia.id/ekonomi-digital/detail/pengguna-ecommerce-ri-diproyeksi-capai-19647-juta-pada-2023

Mustajibah, T. (2021). Dinamika E-Commerce Di Indonesia Tahun 1999-2015. *E-Journal*

Pendidikan Sejarah, *10*(3), 3–11.

Musyaffi, A. M., Baxtishodovich, B. S., Johari, R. J., Wolor, C. W., Afriadi, B., & Muna, A. (2024). Can Financial Advantages and Digital Payments Adoption Provide Effective Solutions to Improve SMEs' Performance? *Montenegrin Journal of Economics*, *20*(2), 75–89. https://doi.org/10.14254/1800-5845/2024.20-2.7

Musyaffi, A. M., Gurendrawati, E., Afriadi, B., Oli, M. C., Widawati, Y., & Oktavia, R. (2022). Resistance of Traditional SMEs in Using Digital Payments: Development of Innovation Resistance Theory. *Human Behavior and Emerging Technologies*, *2022*. https://doi.org/10.1155/2022/7538042

Musyaffi, A. M., Johari, R. J., Rosnidah, I., Respati, D. K., Wolor, C. W., & Yusuf, M. (2022). Understanding Digital Banking Adoption During Post-Coronavirus Pandemic: An Integration of Technology Readiness and Technology Acceptance Model. *TEM Journal*, *11*(2), 683–694. https://doi.org/10.18421/TEM112-23

Musyaffi, A. M., Johari, R. J., Rosnidah, I., Sari, D. A. P., Amal, M. I., Tasyrifania, I., Pertiwia, S. A., & Sutanti, F. D. (2021). Digital Payment during Pandemic: An Extension of the Unified Model of QR Code. *Academic Journal of Interdisciplinary Studies*, *10*(6), 213–223. https://doi.org/10.36941/ajis-2021-0166

Musyaffi, A. M., Sulistyowati, W. A., Wolor, C. W., & Sasmi, A. A. (2022). Game-based Learning Sustainability During Social Distance: The Role of Gamification Quality. *European Journal of Educational Research*, *11*(3), 1289–1302. https://doi.org/10.12973/eu-jer.11.3.1289

Nada, D. Q., Suryaningsum, S., Kusuma, H., & Negara, S. (2021). *Digitalization of the Quick Response Indonesian Standard (QRIS) Payment System for MSME Development*. *4*(3), 551–558.

Najib, M., & Fahma, F. (2020). Investigating the adoption of digital payment system through an extended technology acceptance model: An insight from the Indonesian small and medium enterprises. *International Journal on Advanced Science, Engineering and Information Technology*, *10*(4), 1702–1708. https://doi.org/10.18517/ijaseit.10.4.11616

Nowak, A., Brzezińska, & Królik, J. (2023). Comparative analysis of selected algorithms for qualitative data clustering. *Procedia Computer Science*, *225*, 4196–4205. https://doi.org/10.1016/j.procs.2023.10.416

Oliveira, T., Thomas, M., Baptista, G., & Campos, F. (2016). Mobile payment: Understanding the determinants of customer adoption and intention to recommend the technology. *Computers in Human Behavior*, *61*(2016), 404–414. https://doi.org/10.1016/j.chb.2016.03.030

Ooi, K. B., Lee, V. H., Tan, G. W. H., Hew, T. S., & Hew, J. J. (2018). Cloud computing in manufacturing: The next industrial revolution in Malaysia? *Expert Systems with Applications*, *93*, 376–394. https://doi.org/10.1016/j.eswa.2017.10.009

Ram, S., & Sheth, J. N. (1989). Consumer resistance to innovations: The marketing problem and its solutions. *Journal of Consumer Marketing*, *6*(2), 5. https://doi.org/10.1108/EUM0000000002542

Ramayanti, R., Rachmawati, N. A., Azhar, Z., & Nik Azman, N. H. (2023). Exploring intention and actual use in digital payments: A systematic review and roadmap for future research. *Computers in Human Behavior Reports*, 100348. https://doi.org/10.1016/j.chbr.2023.100348

Ruslan, Karmawan, G. M., Suharjito, Fernandoand, Y., & Gui, A. (2019). QR Code Payment in Indonesia and Its Application on Mobile Banking. *KnE Social Sciences*, *2019*, 551–568. https://doi.org/10.18502/kss.v3i22.5073

Silvia, S. (2022). *Perkembangan Sistem Pembayaran di Indonesia, Dari Masa Kemerdekaan sampai Era Digital*. Flip.Id. https://flip.id/business/blog/perkembangan-sistem-

pembayaran-di-indonesia

Singh, S., & Srivastava, R. . (2018). Article information : Predicting the Intention to Use Mobile Banking in India Introduction. *International Journal of Bank Marketing*, *36*(2), 357–378.

Sivathanu, B. (2019). Adoption of digital payment systems in the era of demonetization in India: An empirical study. *Journal of Science and Technology Policy Management*, *10*(1), 143–171. https://doi.org/10.1108/JSTPM-07-2017-0033

Stefánsdóttir, N. T., Nilsen, P., Lindstroem, M. B., Andersen, O., Powell, B. J., Tjørnhøj-Thomsen, T., & Kirk, J. W. (2022). Implementing a new emergency department: a qualitative study of health professionals' change responses and perceptions. *BMC Health Services Research*, *22*(1), 1–20. https://doi.org/10.1186/s12913-022-07805-w

Surekha, A., Rubesh Anand, P. M., & Indu, I. (2015). E-payment transactions using encrypted QR codes. *International Journal of Applied Engineering Research*, *10*(77), 460–463. https://www.researchgate.net/publication/295073050

Susilo, A. Z., Prabowo, M. I., Taman, A., Pustikaningsih, A., & Samlawi, A. (2019). A comparative study of factors affecting user acceptance of go-pay and OVo as a feature of Fintech application. *Procedia Computer Science*, *161*, 876–884. https://doi.org/10.1016/j.procs.2019.11.195

Syaharani, M. (2023). *10 Negara Dengan Pengguna Smartphone Terbanyak Di Dunia, Indonesia Masuk Daftar!* GoodStats.Id. https://goodstats.id/article/10-negara-dengan-pengguna-smartphone-terbanyak-di-dunia-indonesia-masuk-daftar-fDv25#:~:text=Indonesia merupakan negara dengan jumlah,terbanyak%2C mencapai 73 juta pengguna.

Talwar, S., Dhir, A., Scuotto, V., & Kaur, P. (2021). Barriers and paradoxical recommendation behaviour in online to offline (O2O) services. A convergent mixed-method study. *Journal of Business Research*, *131*(March), 25–39. https://doi.org/10.1016/j.jbusres.2021.03.049

Tamilmani, K., Rana, N. P., Wamba, S. F., & Dwivedi, R. (2021). The extended Unified Theory of Acceptance and Use of Technology (UTAUT2): A systematic literature review and theory evaluation. *International Journal of Information Management*, *57*(November 2020), 102269. https://doi.org/10.1016/j.ijinfomgt.2020.102269

Thathsarani, U. S., & Jianguo, W. (2022). Do Digital Finance and the Technology Acceptance Model Strengthen Financial Inclusion and SME Performance? *Information (Switzerland)*, *13*(8). https://doi.org/10.3390/info13080390

Ting, H., Yacob, Y., Liew, L., & Ming, W. (2016). Intention to Use Mobile Payment System : A Case of Developing Market by Ethnicity. *Procedia - Social and Behavioral Sciences*, *224*(August 2015), 368–375. https://doi.org/10.1016/j.sbspro.2016.05.390

Widayat, W., Masudin, I., & Satiti, N. R. (2020). E-Money payment: Customers' adopting factors and the implication for open innovation. *Journal of Open Innovation: Technology, Market, and Complexity*, *6*(3), 57. https://doi.org/10.3390/JOITMC6030057

Wisniewski, T. P., Polasik, M., Kotkowski, R., & Moro, A. (2021). Switching from Cash to Cashless Payments during the COVID-19 Pandemic and Beyond. *SSRN Electronic Journal*, *337*. https://doi.org/10.2139/ssrn.3794790

Worldometer. (2023). *Indonesia Population*. Worldometers.Info. https://www.worldometers.info/world-population/indonesia-population/

Zhou, T., Lu, Y., & Wang, B. (2010). Integrating TTF and UTAUT to explain mobile banking user adoption. *Computers in Human Behavior*, *26*(4), 760–767. https://doi.org/10.1016/j.chb.2010.01.013