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The Effect of Digital Literacy, Trust in Security, and Transaction Costs on Optimizing the Utilization of QRIS in MSMEs with Ease of Use as an Intervening Variable

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ABSTRAK

Penelitian ini bertujuan untuk menganalisis pengaruh literasi digital, kepercayaan terhadap keamanan, dan biaya transaksi terhadap optimalisasi pemanfaatan QRIS oleh pelaku UMKM di Bangka Belitung, dengan kemudahan penggunaan sebagai variabel mediasi. Menggunakan pendekatan kuantitatif jenis explanatory research, data dikumpulkan melalui kuesioner Likert 1–5 dari 157 pelaku UMKM yang dipilih secara purposive sampling. Validitas dan reliabilitas instrumen diuji melalui KMO, Bartlett's Test, dan Cronbach's Alpha. Analisis dilakukan dengan metode Partial Least Square-Structural Equation Modeling (PLS-SEM) menggunakan SmartPLS, serta uji mediasi melalui bootstrapping dan Sobel test. Hasil menunjukkan bahwa literasi digital berpengaruh langsung signifikan terhadap optimalisasi QRIS. Sementara itu, kepercayaan terhadap keamanan dan biaya transaksi berpengaruh tidak langsung melalui kemudahan penggunaan sebagai mediator. Temuan ini menegaskan pentingnya persepsi kemudahan dalam mendorong adopsi QRIS oleh UMKM. Implikasi praktisnya, perlu intervensi kebijakan berupa peningkatan literasi digital, penyederhanaan fitur, dan transparansi biaya oleh pemerintah dan penyedia layanan digital.

Keyword: Literasi Digital; Kepercayaan Terhadap Keamanan; Biaya Transaksi; Optimalisasi QRIS; UMKM

ABSTRACT

This study aims to analyze the influence of digital literacy, trust in security, and transaction costs on optimizing the use of QRIS by MSME actors in Bangka Belitung, with ease of use as a mediation variable. Using an explanatory research type quantitative approach, data was collected through a Likert questionnaire 1–5 from 157 MSME actors selected by purposive sampling. The validity and reliability of the instruments were tested through KMO, Bartlett's Test, and Cronbach's Alpha. The analysis was carried out using the Partial Least Square-Structural Equation Modeling (PLS-SEM) method using SmartPLS, as well as mediation tests through bootstrapping and Sobel tests. The results show that digital literacy has a significant direct effect on QRIS optimization. Meanwhile, trust in security and transaction costs has an indirect effect through the ease of use as a mediator. These findings confirm the importance of the perception of convenience in encouraging the adoption of QRIS by MSMEs. The practical implication is that policy interventions are needed in the form of increasing digital literacy, simplifying features, and cost transparency by the government and digital service providers.

Keyword: Digital Literacy; Trust in Security; Transaction Cost; QRIS Optimization; MSMEs

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1. INTRODUCTION

Digitalization has fundamentally changed the way business actors run their business operations, especially in terms of financial transactions. In the midst of the rapid development of information technology,

Micro, Small, and Medium Enterprises (MSMEs) as the backbone of the Indonesian economy are also encouraged to transform towards digital to increase efficiency, transparency, and competitiveness. One form of digital innovation that has begun to be implemented in the MSME ecosystem is a payment system based on a quick response code, namely the Quick Response Code Indonesian Standard (QRIS) launched by Bank Indonesia. QRIS is designed as a non-cash payment system that unites various payment applications into one QR code standard, making it easier for consumers and business actors to make transactions quickly and securely (Setiawan & Hidayat, 2021).

The implementation of QRIS in the MSME sector is considered strategic because it not only increases transaction efficiency, but also becomes an important instrument in encouraging financial inclusion. With QRIS, MSME actors can receive payments digitally without having to have various devices or accounts from each payment service provider. In addition to facilitating access to formal financial services, QRIS also provides other benefits such as increased accuracy of financial records, reduced risk of cash loss, and ease of cash flow tracking. Furthermore, this system supports the government's vision of expanding an inclusive digital economy ecosystem and encouraging the growth of non-cash financial transactions in Indonesia (Nugroho et al., 2020).

However, despite the various benefits that have been offered, the adoption rate of QRIS among MSMEs still faces a number of challenges. One of the main obstacles is the low level of digital literacy, where there are still many MSME actors who are not familiar with how financial technology works or are not confident enough to use it (Riyanto, 2020). In addition, trust in transaction security is also an important determining factor. Fear of data leaks, digital fraud, and other security risks has made some MSME actors reluctant to switch to digital payment systems (Yuliani et al., 2021). On the other hand, the perception of transaction fees charged by QRIS service providers can also be a barrier, especially for small business actors with relatively low profit margins (Anggraini & Pratiwi, 2021).

In addition to these three factors, the perception of ease of use is an important element that can mediate the influence of digital literacy, trust in security, and transaction costs on the decision of MSME actors to utilize QRIS optimally. If a system is perceived to be easy to understand and operate, then the barriers to technology adoption can be significantly reduced. Therefore, understanding the mediating role of ease-of-use perception mediation is very important to explain more deeply why some MSMEs have successfully adopted QRIS while others have not. The role of this intervening variable has not been explicitly discussed in previous research, especially in the context of MSMEs in Indonesia.

Based on this background, this study aims to analyze the influence of digital literacy, trust in security, and transaction costs on optimizing the use of QRIS in MSME actors, with ease of use as an intervening variable. This research offers novelty by integrating the dimensions of technology and user behavior through a structural approach that tests the mediating role of ease of use. This approach makes a theoretical contribution to the development of a QRIS-based digital payment technology adoption model and enriches the literature on the digitalization of MSMEs. Practically, the results of this study are expected to be a reference for the government, Bank Indonesia, and financial technology developers to design targeted education, socialization, and incentive strategies to expand the effective and sustainable use of QRIS in the MSME sector.

2. LITERATURE REVIEW

A. The relationship between digital literacy and the ease of use of QRIS

Digital literacy is the ability of individuals to understand, evaluate, and use digital technology effectively in various activities (Spante et al., 2018). In the context of the adoption of payment technology such as QRIS, digital literacy plays an important role in influencing users' perceptions of ease of use. Good digital literacy helps individuals understand how technology works, navigate the features provided, and overcome technical obstacles that may arise (Sinha et al., 2022). Research by Amalia and Pratama (2023) shows that a higher level of digital literacy among MSME actors in Indonesia significantly increases the perception of the ease of use of QRIS. Individuals who have good digital literacy skills tend to feel more confident in using new technologies, thus reducing resistance to their use. This is supported by the Technology Acceptance Model (TAM) which states that the perception of the ease of use of technology is directly influenced by the user's ability to understand the technology (Davis, 1989).

Another study by Putri and Nugroho (2023) also found that MSME actors with low levels of digital literacy often face obstacles in operating QRIS, such as difficulty understanding the user interface or overcoming technical problems. Therefore, increasing digital literacy is considered a strategic step to encourage the optimization of the use of QRIS through increasing the perception of ease of use. Thus, digital literacy can be considered as a variable that strengthens the perception of the ease of use of QRIS. The higher the level of digital literacy, the more likely users are to feel that QRIS is an easily accessible and user-friendly technology, thus supporting wider adoption among MSMEs.

H1: Digital literacy has a positive effect on the ease of use of QRIS.

B. Relationship of Trust to security with ease of use of QRIS

Trust in security is the belief of users that technological systems, including QRIS, can protect personal data, financial transactions, as well as avoid them from the risk of fraud (Gefen et al., 2003). In the context of technology adoption, trust in security is a crucial factor that influences users' perception of ease of use. Users tend to feel more comfortable and easier to use technology if they are confident that the system is safe and reliable (Alshahrani et al., 2021). According to a study by Widiyanto and Saraswati (2022), trust in security has a positive relationship with the perception of the ease of use of QRIS among MSMEs. When MSME actors are confident that QRIS is able to protect their transactions securely, they are more likely to explore the features of the technology without worry. This reduces psychological barriers that can affect perceptions of the complexity of using technology.

Another study by Putri and Nugroho (2023) also found that a strong perception of security can reduce fear of the risk of financial losses due to technical errors or cyberattacks. Thus, users find it easier to learn and use systems like QRIS, even if they are adopting the technology for the first time. The relationship between trust in security and ease of use is also in line with the Technology Acceptance Model (TAM) framework, which states that external factors such as trust affect users' perception of the ease of use of technology (Davis, 1989). In this case, security serves as a cornerstone for users to feel comfortable using QRIS, thus encouraging wider adoption of the technology.

H2: Trust in security has a positive effect on the ease of use of QRIS

C. The relationship between transaction fees and the ease of use of QRIS.

Transaction fees include various expenses incurred by users to use payment technology, including administrative fees, service fees, and other additional fees (Williamson, 1981). In the context of the use of QRIS by MSMEs, transaction costs are one of the important factors that affect the perception of the ease of use of this technology. The lower the fee charged, the more likely users are to consider QRIS as an easy and feasible system to use (Putri & Nugroho, 2023). Research by Zhao et al. (2022) shows that competitive transaction fees can increase the perception of ease of use of payment technology. This is because users don't have to face excessive financial barriers when trying to integrate QRIS into their business. In contrast, high transaction costs are often a major barrier to the adoption of new technologies because they are considered to increase operational burdens, especially for MSMEs with thin profit margins.

Another study from Pranoto et al. (2022) states that low transaction fees contribute to the perception that digital payment technologies, including QRIS, are easily accessible and usable. With the affordability of the cost, users are more likely to learn and use these technological features without worrying about adverse financial impacts. Within the framework of the Technology Acceptance Model (TAM), transaction fees can affect the perception of ease of use through their impact on external barriers perceived by users (Davis, 1989). Reduced transaction costs increase positive perceptions of the ease of use of QRIS, which in turn can drive higher levels of technology adoption among MSMEs.

H3: Transaction fees have a negative effect on the ease of use of QRIS.

D. The relationship between digital literacy and the optimization of the use of QRIS in MSMEs.

Digital literacy is the ability of individuals to understand, evaluate, and use digital technology effectively (Spante et al., 2018). In the context of MSMEs, digital literacy plays an important role in determining how optimally business actors can utilize digital payment technology such as QRIS. The higher the level of digital literacy, the better the user's understanding and skills in using the features provided by QRIS, which can ultimately encourage the optimization of their use (Amalia & Pratama, 2023). A study by Nugroho and Rahmawati (2022) shows that good digital literacy among MSME actors increases their ability to make maximum use of QRIS, such as making cashless transactions, managing financial reports automatically, and reaching a wider range of consumers. Digital literacy also helps MSMEs overcome technical barriers that often arise, such as difficulties in understanding user interfaces or connectivity issues.

In addition, research by Sari et al. (2023) highlights that digital literacy also plays a role in building trust in QRIS technology. MSME actors who have good digital literacy tend to have a higher level of trust in the reliability and security of QRIS, so they are more motivated to use it consistently in their daily business activities. Within the framework of technology adoption, digital literacy supports the ability of users to understand the benefits of technology and integrate it into business processes, thereby contributing to the optimization of QRIS utilization. Low digital literacy can lead to misuse or fear of technology, which hinders widespread adoption

H4: Digital literacy has a positive effect on optimizing the use of QRIS in MSMEs

E. The Relationship of Trust in Security with Optimizing the Use of QRIS in MSMEs

Trust in security is the user's belief that technological systems, such as QRIS, can protect personal data, financial transactions, and avoid the risk of fraud or cyber threats (Gefen et al., 2003). In the context of MSMEs, trust in QRIS security is an important factor that affects how optimally business actors use this

payment technology. When users feel confident that QRIS is a secure and reliable system, they tend to be more motivated to make the most of the available features (Widiyanto & Saraswati, 2022). A study by Kurniawan and Pratiwi (2023) shows that trust in security plays a significant role in encouraging MSME actors to use QRIS consistently in their business operations, including for customer transactions, cash flow management, and digital recording. This trust helps reduce concerns about technology risks, so users are more focused on the benefits offered by QRIS.

In addition, research from Sari et al. (2023) found that users who have high confidence in the security of QRIS are more likely to optimize various additional features, such as automated financial report management or connectivity with other digital platforms. Conversely, low trust in the security of the technology can hinder users from fully adopting and utilizing QRIS, due to the fear of possible losses. Trust in security also influences the adoption of technology within the framework of the Unified Theory of Acceptance and Use of Technology (UTAUT), which states that the perception of technological security can increase the intention of users to make optimal use of the technology (Venkatesh et al., 2003). Thus, trust in the security of QRIS is an important prerequisite for MSMEs to achieve the optimization of the use of this technology.

H5: Trust in security has a positive effect on optimizing the use of QRIS in MSMEs

F. The relationship between transaction costs and the optimization of QRIS utilization in MSMEs

Transaction fees are an important element that can influence users' decisions in utilizing digital payment technology such as QRIS. Transaction fees include administrative fees, service fees, and other additional fees charged in each use of QRIS (Williamson, 1981). In the context of MSMEs, low transaction fees can be the main attraction, as it provides financial benefits while encouraging users to make optimal use of QRIS (Putri & Nugroho, 2023). Research by Pratama and Wijayanti (2023) shows that competitive transaction fees contribute positively to optimizing the use of QRIS. MSMEs that feel that QRIS fees are affordable tend to use them more often, both for customer transactions and for digital financial management. Conversely, high transaction costs are often a major barrier for MSMEs, as they add to their operational burden.

Another study by Zhao et al. (2022) confirms that reduced transaction fees increase user convenience in utilizing QRIS features. This creates a more positive experience for MSME actors, so they are more encouraged to fully integrate QRIS into their business activities. Optimizing the utilization of QRIS is not only limited to basic use, but also includes the exploration of additional features such as automatic transaction recording or real-time financial reports. Within the framework of the Unified Theory of Acceptance and Use of Technology (UTAUT), transaction costs are one of the external factors that can affect users' intentions and behaviors in using technology optimally (Venkatesh et al., 2003). Low transaction fees create added value for users, thereby increasing the adoption and utilization rate of QRIS.

H6: Transaction fees have a negative effect on optimizing the use of QRIS in MSMEs

G. Relationship Ease of use in mediating the relationship between digital literacy, trust in security, and transaction costs by optimizing the use of QRIS

Ease of use in the context of technology refers to the extent to which users feel that a technology can be used easily without significant effort (Davis, 1989). Digital literacy, which includes understanding and ability to use digital technology, contributes to users' perception of the ease of QRIS. MSME actors who have good digital literacy tend to feel more confident in learning and using the QRIS feature, which ultimately strengthens the perception of ease of use. This convenience further encourages the optimization of the use of QRIS, because users feel that the technology is not only useful, but also easy to integrate into their business operations (Amalia & Pratama, 2023). Trust in technology security, such as the belief that QRIS is safe from the risk of fraud or data theft, influences the perception of ease of use. When users feel that QRIS is secure, they tend to be more comfortable and easier to use this technology, without worrying about potential risks that can disrupt their business operations. This supports the optimization of the use of QRIS because users are more focused on the benefits and efficiency of the technology rather than the potential barriers (Gefen et al., 2003; Sari et al., 2023).

Low transaction fees increase users' perception that QRIS is a cost-effective and easy-to-use technology (Zhao et al., 2022). When transaction fees are considered affordable, users feel freer to access the QRIS feature without worrying about additional financial burdens. This perception increases ease of use, which further encourages MSME actors to make optimal use of QRIS, both for daily transactions and long-term financial management (Putri & Nugroho, 2023). Overall, ease of use acts as a bridge that connects the variables of digital literacy, trust in security, and transaction costs with optimizing the use of QRIS. Within the framework of the Technology Acceptance Model (TAM), ease of use affects the perception of benefits, which in turn influences the adoption of technology more widely (Davis, 1989). Thus, increasing the perception of ease of use is an important strategy to optimize the use of QRIS by MSMEs.

H7: Ease of use mediates the relationship between digital literacy, trust in security, and transaction costs by optimizing the use of QRIS

3. RESEARCH METHOD

This study uses a quantitative approach with a survey method to examine the relationship between night shifts, work-life balance, ergonomic factors, and the risk of work accidents, with compliance with safety protocols as a mediating variable. The research design used is explanatory research with a cross-sectional approach, where data is collected at one point in time. The purpose of this approach is to test the causal relationship between variables in the conceptual model that has been formulated based on theoretical reviews and previous studies.

The population in this study were workers involved in the shift work system, especially the night shift, in the high-risk industrial sector. A sample of 154 respondents was obtained through purposive sampling technique with the criteria that workers have a minimum night work experience of six months. The data collection instrument was a questionnaire with a five-point Likert scale, which was arranged based on the theoretical indicators of each variable. The content validity of the questionnaire was tested through expert judgement, while reliability and construct validity tests were carried out at the data processing stage.

Data analysis was conducted using Structural Equation Modeling (SEM) method based on Partial Least Squares (PLS) with the help of SmartPLS 4 software. This analysis includes testing the outer model (validity and reliability of indicators) and inner model (relationship between latent variables). Mediation tests were also conducted to determine the role of compliance with safety protocols in bridging the influence of night shifts, work-life balance, and ergonomic factors on the risk of work accidents. The use of SEM-PLS was chosen because it is able to handle models with many latent constructs and a small sample size.

4. RESULTS AND DISCUSSION

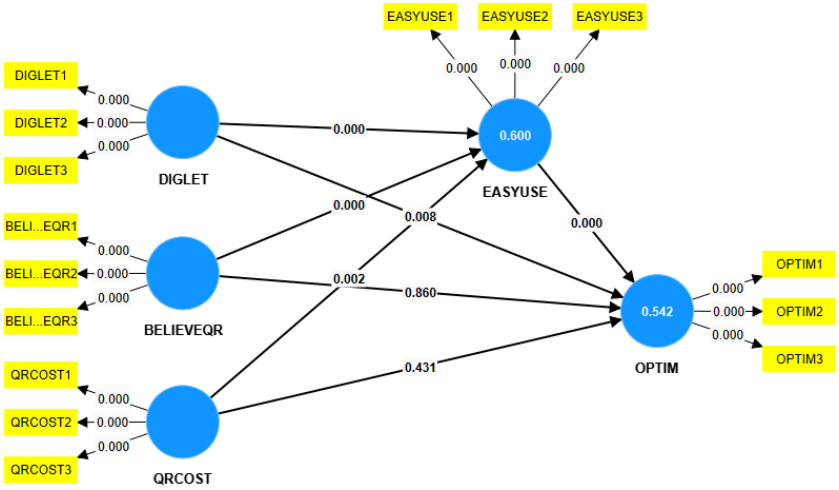

Figure 1. Bootstraping Test

Table 1. Path Coefficient (Mean, Stdev, T Values, P Values)

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values	Hipotesis Conclusion
BELIEVEQR -> EASYUSE	0.477	0.479	0.085	5.634	0.000	Accepted
BELIEVEQR -> OPTIM	0.022	0.032	0.124	0.177	0.860	Rejected
DIGLET -> EASYUSE	0.458	0.458	0.072	6.377	0.000	Accepted
DIGLET -> OPTIM	0.296	0.294	0.111	2.658	0.008	Accepted
EASYUSE -> OPTIM	0.453	0.442	0.103	4.386	0.000	Accepted
QRCOST -> EASYUSE	-0.215	-0.222	0.071	3.033	0.002	Accepted
QRCOST -> OPTIM	0.070	0.066	0.089	0.787	0.431	Rejected
BELIEVEQR -> EASYUSE -> OPTIM	0.216	0.210	0.055	3.937	0.000	Accepted
DIGLET -> EASYUSE -> OPTIM	0.208	0.204	0.063	3.294	0.001	Accepted
QRCOST -> EASYUSE -> OPTIM	-0.097	-0.096	0.035	2.819	0.005	Accepted

A. The Effect of Trust on Security

Trust on Security has a significant effect on ease of use with a coefficient value of 0.477 and a significance value of 0.000. This shows that the higher the trust of MSME actors in the security of QRIS, the perception of its ease of use also increases significantly. However, BELIEVEQR has no direct effect on OPTIM (optimization of QRIS usage) because the P value of 0.860 is well above the threshold of 0.05. This means that trust in security does not directly encourage the optimization of the use of QRIS. However, there was a significant indirect effect through EASYUSE (coefficient 0.216; P = 0.000), which shows that trust can encourage QRIS optimization if MSME actors feel that QRIS is easy to use.

The influence of trust on security (BELIEVEQR) on ease of use (EASYUSE) and optimization of the use of QRIS (OPTIM) in MSMEs can be explained through the Technology Acceptance Model (TAM) theory developed by Davis (1989). In this model, perception of perceived ease of use and perceived usefulness are the two main factors that affect the acceptance of technology by users. Trust in security is an important element in the digital context, as the perception that the system is secure will shape users' positive confidence in technology. Thus, the results of this study show that BELIEVEQR has a significant effect on EASYUSE (coefficient 0.477; P = 0.000) is in line with TAM theory, because the sense of security will increase the convenience of users in using digital payment systems such as QRIS.

Furthermore, the results of this study show that trust in security has no direct effect on the optimization of the use of QRIS (coefficient 0.022; P = 0.860), but has a significant indirect influence through ease of use (coefficient 0.216; P = 0.000). This supports the view that while trust is an important prerequisite, it is not the only determining factor in driving technology optimization. These findings are consistent with previous research by Gefen et al. (2003) which stated that trust has a mediating effect through the perception of convenience and usability in the context of e-commerce and information systems. So, in the context of MSMEs and QRIS, trust in security alone is not enough to encourage optimal use without the perception that the system is also easy to use.

In the context of previous research, these results are in line with a study conducted by Susanto & Goodwin (2010) which found that in the adoption of digital payment technology among small businesses, security plays an important role as an initial driving factor, but the sustainability of use is strongly influenced by the perception of convenience and convenience. Similarly, research by Kim et al. (2008) found that trust in payment systems contributes to initial user acceptance, but long-term adoption is strongly influenced by perceptions of technical features and ease of use. Therefore, trust in QRIS security needs to be followed by a strategy that improves the user experience so that users feel that the system is not only secure, but also efficient and easy to use. Practically, these results provide important implications for financial technology developers and the government in encouraging the adoption of QRIS by MSME actors. Efforts to increase trust in security, for example through cybersecurity education, transparency of transaction processes, and strengthening regulations, must be balanced with user-friendly interface design and easy-to-understand usage training. Only with the combination of these two factors, namely a sense of security and a perception of convenience, can the optimization of the use of QRIS be achieved optimally among small and medium business actors.

B. The Influence of Digital Literacy

Digital Literacy has a significant direct influence on EASYUSE (coefficient of 0.458; P = 0.000) and also against OPTIM (coefficient 0.296; P = 0.008). This shows that good digital literacy for MSME actors not only increases the perception of the ease of using QRIS, but also directly encourages the optimization of its use. In addition, there is also an indirect effect through EASYUSE (coefficient of 0.208; P = 0.001), strengthening the role of digital literacy as an important factor in increasing the effectiveness of QRIS utilization by MSMEs. The influence of digital literacy (DIGLET) on ease of use (EASYUSE) and optimization of the use of QRIS (OPTIM) can be explained through the framework of the Digital Literacy Framework and the Unified Theory of Acceptance and Use of Technology (UTAUT) theory. Digital literacy is an individual's ability to understand, assess, and utilize digital technology effectively. In the context of the adoption of financial technology such as QRIS, digital literacy is key in increasing user confidence in interacting with the system, thus contributing directly to the perception of ease of use. The findings in this study show a significant effect of DIGLET on EASYUSE (coefficient 0.458; P = 0.000) emphasized that MSME actors who have a good level of digital literacy will be faster and easier to adjust to using QRIS as a digital payment tool.

More than just convenience, the results of the study also show that digital literacy has a direct effect on optimizing the use of QRIS (coefficient 0.296; P = 0.008), as well as indirect influence through ease of use (coefficient 0.208; P = 0.001). These findings indicate that digital understanding and skills are able to create efficiency and effectiveness in the overall use of technology. UTAUT's theory supports this finding by stating that facilitating conditions and performance expectancy are greatly influenced by the user's ability to operate the technology. When MSME actors feel able to operate QRIS and see the benefits in supporting their business activities, there will be an increase in optimal use. These results are consistent with previous research such as those conducted by van Deursen & van Dijk (2014) which emphasized the importance of digital literacy in supporting community participation in the digital economy. Another study by Pratama & Firmansyah (2021) in the context of MSMEs in Indonesia also shows that business actors with a high level of digital literacy tend to be more adaptive and proactive in implementing digital technology to increase the competitiveness of their businesses. In addition, research by Rahadi et al. (2020) stated that digital literacy not only affects the level of technology use, but also determines the quality of its use in daily business operations.

The implications of these results are particularly relevant for policymakers, financial institutions, and payment technology developers. To encourage the optimization of QRIS in the MSME sector, a structured and sustainable digital education program is needed. Training that not only focuses on how to use QRIS, but also on improving digital capabilities in general, will be very effective in creating technologically independent MSME actors. Thus, digital literacy is the main foundation that not only opens access to technology, but also ensures that this technology can be used optimally to support the growth of small and medium businesses in the digital economy era.

C. Effect of Transaction Fees

Transaction Fees have a significant negative influence on EASYUSE (coefficient -0.215; P = 0.002), meaning that the higher the perception of transaction costs, the lower the perception of the ease of use of QRIS. However, QRCOST has no direct effect on OPTIM (coefficient 0.070; P = 0.431). However, the indirect influence of QRCOST on OPTIM through EASYUSE proved to be significant and negative (coefficient -0.097; P = 0.005), indicating that the perception of high transaction costs indirectly inhibits the optimization of the use of QRIS through the perception of decreased convenience. The effect of transaction costs (QRCOST) on ease of use (EASYUSE) and optimization of the use of QRIS (OPTIM) can be analyzed through the Technology Acceptance Model (TAM) and Perceived Cost Theory theoretical approaches. In the context of TAM, the perception of ease of use is one of the main factors in determining the acceptance of technology. However, the transaction fee factor can act as a psychological and practical barrier that reduces the perception of such convenience. The findings in this study show a negative and significant influence between QRCOST and EASYUSE (coefficient -0.215; P = 0.002) indicates that the higher the perception of MSME actors regarding the cost of using QRIS, the less confident they are that this system is easy to use. This is natural because costs are considered an additional burden in the process of technology adaptation.

Furthermore, although QRCOST did not show a significant direct effect on the optimization of QRIS use (coefficient 0.070; P = 0.431), the indirect effect through EASYUSE was actually proven to be significant and negative (coefficient -0.097; P = 0.005). This means that the perception of high transaction costs indirectly reduces the optimization of QRIS utilization because it reduces the perception that QRIS is easy to use. This can be explained through Perceived Value Theory, where users will judge a technology not only by its benefits, but also by the cost burden that must be beared. If the cost is considered too high, then the overall value of the technology will decrease, even if other features or benefits remain high. This research is supported by several previous studies, such as the study by Lin et al. (2007) which stated that perceived cost has a negative influence Furthermore, although QRCOST did not show a significant direct effect on the optimization of QRIS use (coefficient 0.070; P = 0.431), the indirect effect through EASYUSE was actually proven to be significant and negative (coefficient -0.097; P = 0.005). This means that the perception of high transaction costs indirectly reduces the optimization of QRIS utilization because it reduces the perception that QRIS is easy to use. This can be explained through Perceived Value Theory, where users will judge a technology not only by its benefits, but also by the cost burden that must be beared. If the cost is considered too high, then the overall value of the technology will decrease, even if other features or benefits remain high.

This research is supported by several previous studies, such as research by Lin et al. (2007) which stated that perceived cost has a negative influence on the adoption of digital technology-based services. In the Indonesian context, a study by Handayani et al. (2020) on MSME fintech services shows that transaction fees are one of the main barriers to the adoption of digital payment systems, especially for small businesses that are very sensitive to routine expenses. Research by Ariani and Setiawan (2022) also found that MSME actors who feel burdened by administrative costs tend to be reluctant to optimize the use of digital platforms, even though they already know and have access to the technology. The practical implications of these findings confirm the importance of evaluating the cost structure in the use of QRIS, especially for MSME actors. The government, Bank Indonesia, and digital payment service providers need to consider a more MSME-friendly fee scheme or even incentives for small business actors. In addition, education on cost transparency and the long-term benefits of QRIS needs to be improved to reduce negative perceptions of cost burdens. By suppressing the perception of transaction costs as an obstacle, MSME players will be more encouraged to feel that QRIS is easy to use, so that it can ultimately increase the optimization of its use in supporting their business activities.

Towards the adoption of digital technology-based serviceThe practical implications of these findings confirm the importance of evaluating the cost structure in the use of QRIS, especially for MSME actors. The government, Bank Indonesia, and digital payment service providers need to consider a more MSME-friendly fee scheme or even incentives for small business actors. In addition, education on cost transparency and the long-term benefits of QRIS needs to be improved to reduce negative perceptions of cost burdens. By suppressing the perception of transaction costs as an obstacle, MSME players will be more encouraged to feel that QRIS is easy to use, so that it can ultimately increase the optimization of its use in supporting their business activities. In the Indonesian context, a study by Handayani et al. (2020) on MSME fintech services shows that transaction fees are one of the main barriers to the adoption of digital payment systems, especially for small

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The practical implications of these findings confirm the importance of evaluating the cost structure in the use of QRIS, especially for MSME actors. The government, Bank Indonesia, and digital payment service providers need to consider a more MSME-friendly fee scheme or even incentives for small business actors. In addition, education on cost transparency and the long-term benefits of QRIS needs to be improved to reduce negative perceptions of cost burdens. By suppressing the perception of transaction costs as an obstacle, MSME players will be more encouraged to feel that QRIS is easy to use, so that it can ultimately increase the optimization of its use in supporting their business activities.

D. The Role of Ease-of-Use Mediation

Ease of Use has a significant direct influence on OPTIM (coefficient 0.453; P = 0.000), which indicates that the perception that QRIS is easy to use contributes greatly to the level of optimization of its use by MSMEs. This strengthens the role of EASYUSE as an important mediation variable in bridging the influence of BELIEVEQR, DIGLET, and QRCOST on OPTIM.

The role of ease of use (EASYUSE) as a mediating variable in this study strengthens the theory of Technology Acceptance Model (TAM) proposed by Davis (1989), where perceived ease of use is one of the key factors that affect perceived usefulness and intention to use a technology. In this context, the findings that EASYUSE had a significant effect on OPTIM (coefficient 0.453; P = 0.000) shows that MSMEs' perception of the ease of use of QRIS is an important factor in encouraging them to optimize its use. In other words, while external factors such as trust in security, digital literacy, and cost perceptions influence perceptions of technology, ultimately the decision to adopt the technology to the fullest depends on how easy it is to use.

The mediation role played by EASYUSE is further strengthened when it is seen that the influence of BELIEVEQR and QRCOST on OPTIM is significant only through indirect channels through EASYUSE. For example, BELIEVEQR had no direct effect on OPTIM (P = 0.860), but had a significant effect on EASYUSE and via EASYUSE on OPTIM (mediation coefficient 0.216; P = 0.000). The same was true for QRCOST, which had no direct effect on OPTIM (P = 0.431), but had an indirect negative effect through EASYUSE (coefficient -0.097; P = 0.005). This indicates that the perception of ease of use is an important meeting point between external factors and the acceptance and optimal use of technology.

These findings are in line with several previous studies. Venkatesh and Davis (2000) in the development of TAM2 emphasized that ease of use is often a mediating variable between external factors (such as system conditions and user characteristics) and the intention of use behavior. In addition, a study by Yu (2012) in the context of mobile banking also shows that ease of use acts as a mediator between trust and literacy with the intention and behavior of using the digital financial system. In the context of MSMEs in Indonesia, research by Fauzi and Purwanto (2021) concluded that systems that are considered complicated tend not to be optimized even though users already have sufficient knowledge and trust in the technology.

From a practical perspective, these results show that if we want to encourage the optimization of QRIS among MSMEs, then a strategy focused on increasing the perception of ease of use is crucial. This can be done through simplifying the user interface, improving intuitive features, and training on the use of QRIS that is easily accessible and relevant to the needs of MSME actors. Efforts to build trust, increase digital literacy, and reduce cost perception will be more effective if accompanied by assurances that the QRIS system is easy to learn and use in daily business activities. Thus, EASYUSE is not just a technical variable, but an important bridge to the maximum use of financial technology in the MSME sector.

5. CONCLUSION

Based on the results of the analysis and discussion, it can be concluded that ease of use plays a very important role as a mediating variable in bridging the influence of trust in security (BELIEVEQR), digital literacy (DIGLET), and transaction cost perception (QRCOST) on optimizing the use of QRIS by MSME actors. Digital literacy has the strongest influence, both directly and indirectly, on optimizing the use of QRIS. Meanwhile, trust in security and transaction fees have no direct effect, but both have a significant effect indirectly through the perception of ease of use. This shows that MSME actors' perception of QRIS will be more positive if they feel that the technology is easy to use.

The practical implications of these findings are the importance of policy interventions that emphasize digital literacy training, simplification of QRIS interfaces, and transaction fee transparency to drive wider adoption among MSMEs. The government and digital payment service providers such as Bank Indonesia, banks, and fintech platforms need to provide a structured and inclusive QRIS use assistance program. For further research, it is recommended to explore other external factors such as social support, digital

infrastructure, and organizational culture, and consider a longitudinal approach in order to capture the dynamics of changing behavior of MSMEs towards the adoption of financial technology over time.

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