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THE EFFECT OF TECHNOLOGY READINESS IN THE USE OF QRIS OVO ON CHANGES IN TRANSACTION PATTERNS AT NON-ACE OFFLINE MERCHANTS

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Abstract

This study aims to analyze the effect of Technology Readiness on changes in transaction patterns at NonAce Offline Merchants who are using QRIS OVO. With the widespread adoption of digital payment systems, technology readiness is an important factor in understanding merchants' ability to integrate QRIS OVO into daily business activities. Data was collected through a survey of Non-Ace Offline Merchants in the Greater Jakarta area and analyzed using Partial Least Square-Structural Equation Modeling (PLS-SEM). The results show that technology readiness has a significant effect on changes in transaction patterns, characterized by increased frequency, volume, and variety of transactions. This study makes an important contribution to payment service providers and merchants in understanding the technology readiness factors that could influence transaction patterns.

Keywords: Technology Readiness, QRIS, OVO, Non-Ace Offline Merchants, Transaction Patterns

Introduction

Digital payment services in Indonesia are growing rapidly, supported by initiatives such as QRIS (*Quick Response Code Indonesian Standard)*, which brings together various QR code standards under one system. QRIS, managed by big players in the Indonesian fintech industry such as OVO, as one of the leading providers, enables businesses to facilitate efficient and secure digital transactions. QRIS also opens up opportunities for various types of merchants, including the “Non-Ace Offline Merchant" category, to access a more modern and integrated payment system. The term ‘Non-Ace Offline Merchants’ refers to offline physical businesses that do not fall under the food and beverages or supermarkets segments. This category includes businesses such as laundry, bookstores, barbershops, fashion stores, and other services outside the food and beverages (FnB) and convenience sector.

However, research related to QRIS adoption among Non-Ace Offline Merchants is limited, even though they are an important segment that contributes greatly to the digital economy. According to research conducted by McKinsey (2023) and CGAP (2023), studies on small merchants usually focus on specific sectors, so Non-Ace businesses are often overlooked. This creates a unique opportunity to explore how digital payment technologies affect different types of businesses outside of the commonly researched sectors. This study aims to fill that gap by focusing on how Technology Readiness, as developed by Parasuraman (2001), measured through four dimensions-Optimism, Innovation, Inconvenience, and Insecurity-affects transaction patterns at Non-Ace Offline Merchants after using QRIS OVO. The three objectives of this study are: one, to know the level of technology readiness of Non-Ace Offline Merchants in using QRIS OVO; two, to know the changes in transaction patterns based on frequency, volume and variation that occur at Non-Ace Offline Merchants after using QRIS OVO; and three, to analyze the effect of technology readiness on changes in transaction patterns (frequency, volume and variation) of Non-Ace Offline Merchants after using QRIS OVO.

Methods

This study employs a quantitative approach to assess the relationship between Technology Readiness and Transaction Pattern Changes among offline merchants using QRIS OVO in the Jabodetabek area. The quantitative method was selected for its ability to facilitate structured data collection and objective statistical analysis, allowing the results to be more broadly applicable. A correlational research design was chosen, focusing on evaluating the association between Technology Readiness and transaction changes rather than establishing causality.

The target population for this study includes all offline merchants in Jabodetabek who use QRIS OVO, excluding those in the food and beverage or convenience store sectors. This population comprises various types of businesses, such as laundromats, electronics stores, and clothing shops. To ensure the

relevance of the findings, a purposive sampling technique was applied, with the main criterion being that merchants had used QRIS OVO for at least one year. This sampling method aimed to include merchants with sufficient experience to provide meaningful data regarding transaction patterns following QRIS adoption. Following Hair et al.'s (2014) guidelines, the sample size was set at 100, which satisfies the minimum requirement for structural equation modeling (SEM) by allowing for accurate parameter estimation with adequate data**.**

The study includes two primary variables:

- Technology Readiness (Independent Variable): Measured through the Technology Readiness Index (TRI), which encompasses four dimensions—Optimism, Innovativeness, Discomfort, and Insecurity—each capturing different facets of merchants'readiness to adopt and utilize technology.
- Transaction Pattern Changes (Dependent Variable): Transaction patterns were assessed based on three dimensions—transaction frequency, transaction volume, and payment method variety—to capture comprehensive shifts in transaction behavior due to QRIS adoption.

Each variable was measured on a 9-point Likert scale, where higher scores indicated stronger technology readiness or more significant change in transaction patterns. It should be noted that in this study, all questions on each indicator in the Technology Readiness variable have been structured and adjusted in a consistent direction, so that high scores on all indicators will reflect merchants' positive attitude towards technology. This step is important to maintain consistency in the interpretation of research results and facilitate analysis.

Based on the variables above, the study posits the following hypothesis:

- H_0: Technology Readiness does not significantly influence Transaction Pattern Changes among Non-Ace Offline Merchants using QRIS OVO.
- H_1: Technology Readiness significantly influences Transaction Pattern Changes among Non-Ace Offline Merchants using QRIS OVO.

This hypothesis is rooted in the premise that merchants who exhibit higher levels of Technology Readiness are more likely to experience meaningful changes in their transaction patterns. These changes are expected to manifest through increased transaction frequency, larger transaction volumes, and a greater variety of non-cash payment methods utilized. The hypothesis aligns with the theoretical framework of the Technology Readiness Index (TRI), which suggests that a positive disposition towards technology fosters smoother adoption and integration of digital tools. In the context of QRIS OVO, it is anticipated that merchants with higher readiness will be better equipped to leverage its benefits, resulting in more dynamic and efficient transaction processes. Testing this hypothesis enables a deeper understanding of the role of technology readiness in driving digital payment adoption and its subsequent impact on business operations.

To evaluate this relationship, the study employs comprehensive statistical techniques to ensure the validity and reliability of the findings. The data was analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) to evaluate the hypothesized relationships between Technology Readiness and Transaction Pattern Changes. Descriptive statistics were first applied to summarize the sample characteristics and provide a general overview of the distribution for each variable. Subsequently, PLSSEM was employed due to its robustness in handling complex models with multiple indicators. This method allows for simultaneous assessment of measurement and structural models, making it suitable for examining latent constructs and their interrelationships. The data analysis in this study uses outer model and inner model testing which includes:

- Outer Loading: Ensured that each indicator adequately represented its corresponding latent variable.
- Average Variance Extracted (AVE): Assessed convergent validity, with values above 0.50 indicating that the constructs sufficiently capture the variance in the indicators.
- Composite Reliability (CR) and Cronbach's Alpha: These metrics were calculated to ensure internal consistency, with values above 0.70 indicating reliable constructs.
- Hypothesis Testing: Using path coefficients to test the relationship between latent variables. Tstatistics and p-values are used to determine the statistical significance of the path coefficients.
- R-square (R^2): Measures the predictive power of the structural model. The R^2 value indicates the proportion of variance explained by the independent variables to the dependent variable.

In conclusion, the analysis conducted in this study adheres to robust statistical standards, ensuring the validity and reliability of the results. The use of PLS-SEM, coupled with comprehensive outer and inner model assessments, guarantees that the hypothesized relationships are rigorously tested. With all

critical metrics—such as Outer Loading, AVE, CR, Cronbach's Alpha, hypothesis testing, and R-square—meeting the established thresholds, this study provides strong evidence to support its objectives and establishes the credibility of the study's approach and the reliability of its outcomes.

Results and Discussions

Respondents in this study consisted of 100 Non-Ace Offline Merchants in the Jabodetabek area who are using QRIS OVO. Jabodetabek is the largest economic center in Indonesia, which is not only a hub for business activities, but also has a technology infrastructure that supports the adoption of digital payments. Therefore, merchants operating in this region tend to adopt digital payment technology faster, including QRIS OVO. The use of QRIS OVO by Non-Ace Offline Merchants in this region can reflect how the adoption of this technology takes place in urban areas that are dense with business activities

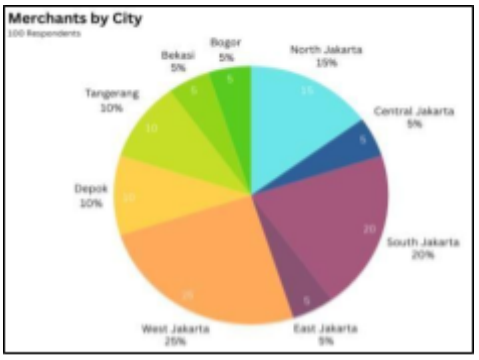

Figure 1
Distributions of Merchants by City

Next, looking at the profile of respondents, it can be seen that the types of businesses involved are very diverse. The diversity among merchant types, including laundries (21%), general retail (14%), and specialty stores such as vape stores (10%), reflects the wide applicability of QRIS OVO across different types of businesses (see Figure 2.). This diversity highlights the usefulness of QRIS OVO not only for everyday consumer services, but also for more specialized and smaller businesses. This shows that QRIS OVO has been successfully adopted by different business segments and is not limited to one type of industry. This variety of business types also indicates that QRIS OVO as a digital payment solution is flexible and can be implemented in many different types of businesses, both service and product based.

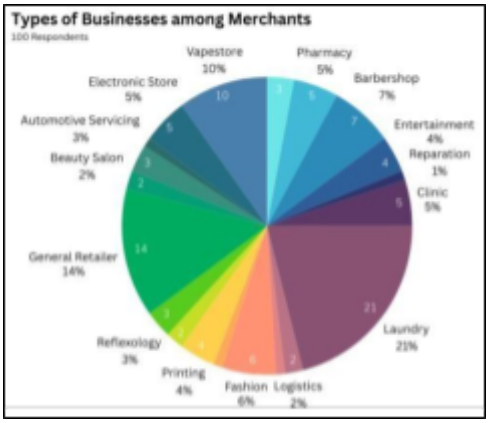

Figure 2
Types of Businesses among Merchants

After examining the respondent data and the diversity of businesses adopting QRIS OVO, the next step is to examine the technological readiness of these merchants. The Technology Readiness Index (TRI), comprising Optimism, Innovativeness, Discomfort, and Insecurity, was utilized to assess merchants' technology readiness in using QRIS OVO as a payment method in their business. It should be noted that each statement in each variable indicator has been designed so that a high score reflects a

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positive attitude towards its Parent Variable. This means that the higher the score, the more it indicates the high technological readiness of the merchant in using QRIS OVO (see Figure 3).

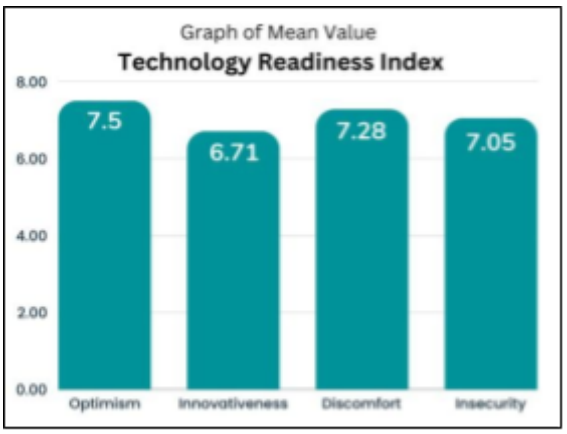

Figure 3
Average Values of the Technology Readiness Indicators

Figure 3 above presents a graphic visualization showing the average value of the Optimism, Innovativeness, Discomfort, and Insecurity indicators on the Technology Readiness variable, which helps us better understand the overall picture of merchant technology readiness. The results indicate high levels of readiness, particularly for Optimism (mean = 7.5) and Innovativeness (mean = 6.71), reflecting merchants' positive attitudes toward QRIS OVO as a valuable tool for enhancing business efficiency. Positive scores for Discomfort (mean = 7.28) and Insecurity (mean = 7.05) also suggest that merchants feel comfortable and secure with QRIS OVO. Overall, this data shows that Non-Ace Offline Merchants have a quite strong technology readiness in using and adopting QRIS OVO. They not only feel optimistic and innovative, but also feel comfortable and secure in the use of this technology. This indicate that merchants generally perceive QRIS OVO positively, which is critical for fostering continuous adoption and enhancing the ecosystem of digital payments.

Having seen how Non-Ace Offline Merchants have good technology readiness in adopting QRIS OVO, it is also important to understand how this technology adoption impacts their transaction patterns. If we take a look at Figure 4 below, QRIS OVO's implementation has resulted in an important shift in transaction patterns, as evidenced by the average increase in several key indicators.

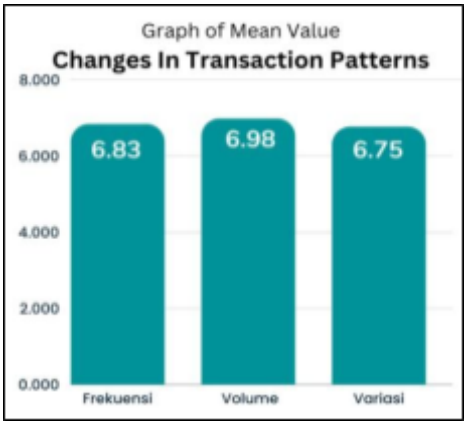

Figure 4
Average Values of the Changes in Transaction Patterns Indicators

The implementation of QRIS OVO has resulted in a notable shift in transaction patterns, as evidenced by an average increase across several key indicators. The frequency of transactions has increased, with an average score of 6.83, which suggests that customers are making transactions more frequently due to the convenience of digital payments. Furthermore, the volume of transactions increased, with an average

score of 6,98. This indicates that consumers are more likely to engage in larger transactions, which is supported by the ease and efficiency of QRIS OVO in handling higher amounts compared to cash. Furthermore, the variety of payment methods demonstrated an increase with an average score of 6.75, indicating that QRIS OVO permits merchants to accept a greater number of digital transactions (non-cash) thereby reducing the reliance on cash or physical money. This result is in line with the study conducted by Kanapathipillai et al. (2024), which found that technological readiness among MSMEs significantly contributes to increasing the number and variety of digital transactions.

Overall, the results of these descriptive statistics show that Non-Ace Offline Merchants experienced positive changes in transaction patterns after adopting QRIS OVO. It can be seen that there is an increase in the frequency, volume, and variety of transaction types experienced by merchants. These descriptive findings provide a solid foundation for understanding the positive impact of QRIS OVO on transaction patterns among Non-Ace Offline Merchants. To deepen this analysis, the structural model evaluation was conducted to quantitatively assess the relationship between Technology Readiness and Transaction Pattern Changes, offering further insights into the underlying dynamics and explanatory power of the model. The structural model evaluation was conducted to examine the significance of the relationship between Technology Readiness and Transaction Pattern Changes. This analysis involved calculating Path Coefficients, t-statistics, and p-values, as well as the R-Squared (R^2) value to assess the model's explanatory power.

Tabel 1 Path Coefficient, T-Statistics, and P-Values for Structural Model

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics	P Values
Technology Readiness Index → Changes In Transaction Patterns	0.818	0.822	0.027	3.782	0.00

As shown in table 1 above, the structural model evaluation shows a robust relationship between Technology Readiness and Changes in Transaction Patterns. The path coefficient of 0.818 suggests a strong positive relationship between Technology Readiness and Transaction Pattern Changes, indicating that merchants with higher readiness levels are more likely to experience positive changes in transaction patterns, such as increased frequency, volume, and variety of payment methods. The t-statistics value of 8.67 significantly exceeds the critical value of 1.96 for a 95% confidence level, confirming the strength and statistical significance of this relationship. The p-value of < 0.001 further supports this finding, demonstrating that the relationship is highly significant and unlikely to be due to random chance.

Tabel 2 R-Squared (R^2) Value for Transaction Pattern Changes

Dependent Variable	R-Squared (R^2) Adjusted
Changes in Transaction Patterns After Using QRIS OVO	0.666

The R-Squared (R^2) value, presented in Table 2, represents the proportion of variance in Transaction Pattern Changes that can be explained by Technology Readiness. With an R^2 of 0.666, the model demonstrates substantial explanatory power, indicating that 66.6% of the variance in transaction changes can be attributed to Technology Readiness. This high R^2 value suggests that Technology Readiness is a strong predictor of changes in transaction patterns among merchants, validating the robustness of the model in explaining how readiness for digital technology adoption impacts transaction outcomes. These results collectively support the hypothesis that Technology Readiness significantly influences Transaction Pattern Changes, establishing a strong and statistically significant model that explains a considerable portion of the variance in transaction changes following the adoption of QRIS OVO.

All of these results indicate that technology readiness has a significant impact on changes in transaction patterns. Merchants with higher levels of technology readiness tend to experience an increase in the frequency, volume and variety of transactions after adopting QRIS OVO. This finding is consistent with Achor and Opara's (2024) research, which highlights that businesses with higher levels of technology readiness experience a smoother transition and successfully benefit from the fintech solutions they use. These findings also support the research of Kumar et al. (2024), who found that businesses with higher technology readiness are better able to overcome barriers to digital payments adoption, leading to

increased efficiency and transaction diversity. Furthermore, this study's findings are also consistent with Saputra and Bahari's (2024) findings that technological readiness is an important factor in successful QRIS adoption among MSMEs. Therefore, it can be concluded that hypothesis 1 (H_1) is accepted, which means that technological readiness has a significant impact on changes in transaction patterns among Non-Ace Offline Merchants. Merchants with higher technology readiness are shown to experience significant changes in transaction frequency, volume and variety after using QRIS OVO.

With Hypothesis 1 (H_1) confirmed, the study establishes that technological readiness significantly influences transaction pattern changes among Non-Ace Offline Merchants using QRIS OVO. The high path coefficient of 0.818, coupled with a statistically significant t-statistic (8.67) and p-value (< 0.001), underscores a robust positive relationship, suggesting that merchants with greater readiness for technology adoption experience more substantial changes in their transaction patterns. Additionally, the R-Squared (R^2) value of 0.666 indicates that Technology Readiness explains a considerable proportion of the variance in transaction patterns, confirming its importance as a predictor of successful digital payment adoption outcomes. These findings offer key implications in three critical areas:

- Implications for Technology Readiness: The findings affirm that Optimism, Innovativeness, Discomfort, and Insecurity, key dimensions of Technology Readiness, play a crucial role in facilitating the adoption of digital payment systems like QRIS OVO. Merchants who view technology positively and are open to new innovations tend to integrate QRIS OVO more effectively into their operations, leading to increased transaction frequency, volume, and method variety. This result aligns with previous studies indicating that optimism towards technology can reduce resistance and enhance adoption, as merchants who are enthusiastic about technology are likely to see QRIS OVO as a valuable tool for enhancing business efficiency and customer satisfaction. Consequently, fostering a positive outlook on technology among merchants could accelerate digital transformation in similar contexts, especially in developing economies where traditional payment methods still dominate.
- Transaction Pattern Changes: The study also highlights specific changes in transaction patterns, with increases observed in frequency, volume, and variety of payment methods. The adoption of QRIS OVO has made transactions more convenient, attracting repeat customers who prefer cashless payments and encouraging merchants to handle larger transaction volumes seamlessly. This shift reduces merchants' dependency on cash and enables them to serve a wider customer base. The increased variety of payment methods further provides operational flexibility, allowing merchants to adapt to diverse customer preferences and further integrating cashless options into their business models. These changes reflect a shift towards more dynamic transaction processes, aligning with studies that emphasize the importance of diversified payment options for enhancing customer experience and fostering loyalty.
- Theoretical and Practical Contributions: This study contributes to the literature on Technology Readiness and Digital Payment Adoption by demonstrating how readiness for technology can directly impact transaction outcomes in offline merchant settings. The strong explanatory power of Technology Readiness for Transaction Pattern Changes ($R^2 = 0.666$) provides empirical support for the role of readiness as a critical factor in successful technology adoption. From a theoretical perspective, these findings extend the Technology Readiness framework by illustrating its relevance to digital payment systems, particularly in the context of small and medium-sized enterprises (SMEs) that operate in urban areas with high consumer demand for cashless transactions.

Practically, this study suggests that policymakers and technology providers, like OVO, should consider strategies to enhance merchants' readiness for technology. Training programs, incentives, and support systems aimed at increasing optimism and reducing discomfort or insecurity with technology could encourage more merchants to adopt digital payment solutions. Such interventions would not only support financial inclusion but also contribute to a more resilient and adaptive business environment, especially in urban centers where digital payments are becoming the norm.

While this study provides significant insights, it is limited by its focus on non-F&B merchants in the Jabodetabek area, which may restrict the generalizability of the findings to other sectors or regions. Future research could examine Technology Readiness in different business sectors or explore longitudinal impacts to understand how transaction patterns evolve over time. Additionally, expanding the study to rural areas could offer insights into how Technology Readiness influences digital adoption in less urbanized settings, where infrastructure and consumer demand may differ.

Conclusion

This research provides insightful conclusions regarding the relationship between Technology Readiness and Transaction Pattern Changes among Non-F&B Offline Merchants adopting QRIS OVO in the Jabodetabek area. The findings highlight three key areas:

1. Technology Readiness among Non-F&B Offline Merchants:
   The results indicate that Non-F&B Offline Merchants exhibit a high level of readiness to adopt digital payment technologies, specifically QRIS OVO. The merchants demonstrate positive attitudes towards technology and an openness to innovation within digital payment systems. Furthermore, they report experiencing minimal discomfort or security concerns in using QRIS OVO, suggesting a smooth integration into their operational processes. Collectively, these findings suggest that Non-F&B Offline Merchants possess the necessary technological foundation to successfully incorporate QRIS OVO, thereby enhancing their business functions and aligning with the broader digital transformation goals in the retail sector.
2. Positive Shifts in Transaction Patterns Following QRIS OVO Adoption:
   Adoption of QRIS OVO has led to observable, positive shifts in transaction patterns among the merchants, spanning three principal dimensions: transaction frequency, transaction volume, and transaction method diversity. The findings show that merchants have experienced increased daily transaction counts, higher transaction volumes, and a broader variety of non-cash transaction methods. These changes signify that QRIS OVO has simplified the transaction process, contributing to improved business performance by streamlining transaction flow and elevating operational efficiency. Such outcomes align with previous literature, which emphasizes the transformative role of digital payment systems in promoting operational agility and enhancing customer satisfaction.
3. The Influence of Technology Readiness on Transaction Pattern Changes:
   The research further establishes that Technology Readiness significantly influences the observed changes in transaction patterns following QRIS OVO adoption. Merchants who exhibit high levels of optimism and innovativeness—alongside comfort and security with digital technologies—tend to experience more pronounced improvements in transaction patterns. This indicates that merchants with a stronger technological orientation are better positioned to harness the advantages of digital payment systems, leading to heightened transaction efficiency and better adaptation to evolving consumer payment preferences. The findings reinforce the importance of technological preparedness as a driver of successful digital payment integration.

In summary, this study underscores Technology Readiness as a vital factor in facilitating the adoption of digital payment systems among Non-F&B Offline Merchants. The findings indicate that higher levels of readiness correlate with more effective utilization of QRIS OVO, resulting in improved transaction outcomes and operational efficiencies. These insights contribute to the broader understanding of digital transformation within the retail sector, offering practical implications for stakeholders, including policymakers, digital payment providers, and merchants themselves, to foster a conducive environment for digital adoption. Future initiatives aimed at enhancing technology readiness among merchants could accelerate the transition towards cashless transactions, thereby supporting economic resilience and business growth within urban centers.

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