



## Qris payment flexibility and the security of transactions on purchase choices in electronic commerce and supermarkets

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### ARTICLE INFO

#### Article history:

Received Nov 11, 2024

Revised Nov 22, 2024

Accepted Nov 30, 2024

#### Keywords:

Purchase Choices;  
Security Of Transactions;  
Qris Payment Flexibility;

### ABSTRACT

The objective of this research is to examine the influence of QRIS payment flexibility and the security of transactions on purchase choices in electronic commerce and supermarkets. This research adopts a quantitative approach using a survey method, involving 88 respondents consisting of 27 males and 61 females. The research instrument is a Likert scale questionnaire with 18 items. Data were examined through the application of multiple linear regression analysis. The findings of the analysis indicate that the R Square value is 0.603, indicating that 60.3% of the variation in purchasing decisions can be explained by QRIS payment flexibility and transaction security. The ANOVA F value of 64.421 with a significance value of <0.001 indicates that the regression model used is significant. These findings imply that QRIS payment flexibility and transaction security collectively exert a notable impact on purchasing decisions within e-commerce or supermarkets. This also underscores that QRIS payment flexibility and transaction security are crucial factors affecting consumer buying choices on e-commerce platforms or in supermarkets.

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## 1. INTRODUCTION

The development of digital technology, especially in payment systems, has markedly influenced consumer behavior in shopping, both on e-commerce platforms and supermarkets (Tuzzahroh & Laela, 2022). This flexibility can include the use of credit cards, bank transfers, electronic wallets, and various digital payment methods such as QRIS (Quick Response Code Indonesian Standard) (Ardani, 2022). One innovation that has received widespread attention is the Quick Response Code Indonesian Standard (QRIS) (Sari, 2024). Quick Response Code Indonesian Standard (QRIS) is one of the innovations developed by Bank Indonesia to facilitate digital payment transactions more efficiently and easily (Putri & Rahmanto, 2023). Payment flexibility refers to the ability of a service provider or platform to offer a variety of diverse and accessible payment methods, allowing consumers to select the payment option that aligns most closely with their requirements and preferences (Mageshkumar, et al, 2023).

The use of QRIS (Quick Response Code Indonesian Standard) in Indonesia, especially in the e-commerce and supermarket sectors, is showing significant growth. Based on recent data, transactions using QRIS are growing rapidly, with transaction volumes increasing by more than 150% by 2023 (Kamalina, 2024). Bank Indonesia (BI) also targets QRIS users to reach 55 million people by 2024, with a projected transaction volume of 2.5 billion transactions (suheriadi, 2024). This shows that QRIS is gaining widespread acceptance, including in the e-commerce and supermarket sectors, which strongly supports the claim that this payment technology plays an important role in streamlining digital transactions in Indonesia.

The use of QRIS in e-commerce and supermarkets still faces various challenges despite offering convenience in transactions. One of the main challenges is the imbalance in technology infrastructure, especially in areas with inadequate internet access (Kristanty, 2024). In addition, the low level of public understanding and education about QRIS hampers the adoption of this technology, as most consumers are still more comfortable using traditional payment methods (Ediputra & Amalyah, 2022). Additionally, business owners such as supermarket owners and merchants are hesitant about the implementation costs, training process, and potential technical difficulties (Chaveesuk, et al, 2021). Consumers' perception of security is also an important factor, as trust in the security of digital payments greatly influences their willingness to use QRIS (Ariningsih, et al, 2022).

The development of information technology has brought major changes in the way consumers transact, especially in the use of digital payments (Tarantang, et al, 2019). The security of transactions is a crucial element that affects consumer confidence in using this payment method (Putri, et al, 2023). Transaction security in the context of e-commerce and supermarkets pertains to the measures, technologies, and methodologies used to protect consumers' individual and financial data from threats such as identity theft, fraud, and unauthorized access (Zarkasyi, 2022). Transaction security includes data encryption, user authentication, and real-time monitoring of transaction activity to detect and prevent suspicious activity (Shandrivska & Shynkarenko, 2020). Good security in transactions provides a sense of security to consumers, which in turn increases their trust in making online purchases (Kumbara, et al, 2023).

The development of digital technology and changes in people's lifestyles have changed consumer shopping patterns, especially in the context of e-commerce and supermarkets (Nugraha, 2023). Purchasing decisions on these two platforms are affected by a variety of factors including convenience, price, commodity availability, and shopping experience (Effendi, 2017). Making purchasing decisions in e-commerce or supermarkets is a intricate procedure that influenced by various factors (Change, et al, 2021). Factors influencing purchasing decisions encompass the convenience of shopping from home, competitive prices, diverse product availability, and a satisfying shopping experience (Taufik, 2015). In addition, elements such as trust in the e-commerce platform or brand reputation within the supermarket also play an important role (Sayatman, et al, 2018).

Based on the results of previous research from Gea & Al-Azhar (2021), it shows that perceptions of convenience, usability, and compatibility have a notable impact on the extent of user satisfaction through 61.6%. User satisfaction in turn affects users' intention to use technology by 68.2%. Furthermore, studies carried out by Zuniarti, et al. (2021) found that trust, convenience, and attitudes play an important role in shaping consumer purchasing decisions in e-commerce. Trust is demonstrated to have the greatest and most notable impact in determining whether consumers will make purchases on the electronic commerce platform.

Apart from the flexible or easy payment process, the safety factor is also the main thing for customers to continue the buying process. As the results of previous research from Sholichin & Wisnalmawati (2021) prove that transaction security positively influences e-commerce purchasing decisions. Apart from transaction security, prices,

reviews, viral marketing also influence purchasing decisions in Shopee e-commerce. In addition, there is also previous research from Rosa, et al. (2019) shows the results of his research that transaction security affects e-commerce purchasing decisions. Online shopping experience using QRIS payments has a positive but insignificant impact on buying choices. The earlier study carried out by Qiao, et al. (2010) shows that aspect of security in transactions is very important for e-commerce and supermarket purchases. QRIS technology increases security in e-commerce and supermarket transactions.

Although previous studies have explored various aspects of QRIS payment systems, significant gaps remain. Limited studies have comprehensively examined how QRIS payment flexibility and transaction security simultaneously affect buying decisions in both e-commerce and supermarket contexts. Most prior research focuses on either payment flexibility or transaction security individually, leaving a holistic understanding of these factors unexplored. Therefore, this research seeks to bridge this gap by examining the "impact of QRIS payment flexibility on purchase decisions in e-commerce and supermarkets" and exploring the interaction between QRIS payment flexibility and transaction security in influencing consumer purchasing decisions.

## 2. RESEARCH METHOD

This study employs a quantitative method utilizing a survey approach to investigate the impact of QRIS payment flexibility and transaction security on buying decisions in electronic commerce and supermarkets (Dawam & Ruski, 2022). A total of 88 respondents were randomly selected as research subjects to represent the population of e-commerce and supermarket users. Determination of the sample size is based on the Slovin formula with a margin of error of 10%, so it is considered adequate to provide an initial picture of the phenomenon under study. However, to ensure that the research results can be generalized, additional evaluation is needed through a power analysis approach (Cohen, 1988) to ensure sample adequacy in detecting significant effects (Godio & Beyer, 2019). If limitations are found, further research with a larger sample may be needed to support the generalizability of the results.

This research uses a questionnaire with 18 items based on a Likert scale (1-5), which has been tested for validity and reliability in a similar population. The validity of the data in this study will be tested using Pearson's correlation method, analyzing the relationship between each item and the total score of the construct. Items with correlation coefficients ( $r$ ) greater than 0.30 and significant at the 0.05 level will be considered valid. Meanwhile, reliability testing will be conducted using Cronbach's Alpha, with a threshold of 0.70 as the criterion for acceptable internal consistency (Aazh, Danesh, & Moore, 2021). The validity test shows that the correlation between the main variables (payment flexibility, transaction security, and purchasing decisions) is significant at the 0.01 level ( $r > 0.60$ ,  $p < 0.01$ ), indicating a strong relationship with the construct. The reliability test produced a Cronbach's Alpha value of 0.890, which indicates very good internal consistency (Jahrami et al., 2023). With these results, the questionnaire was declared valid and reliable for research. The questionnaire indicators comprise aspects of QRIS payment flexibility and payment security which are considered to influence purchasing decisions (Maylinda & Sari, 2021). The research procedures carried out by researchers are as in Figure 1.

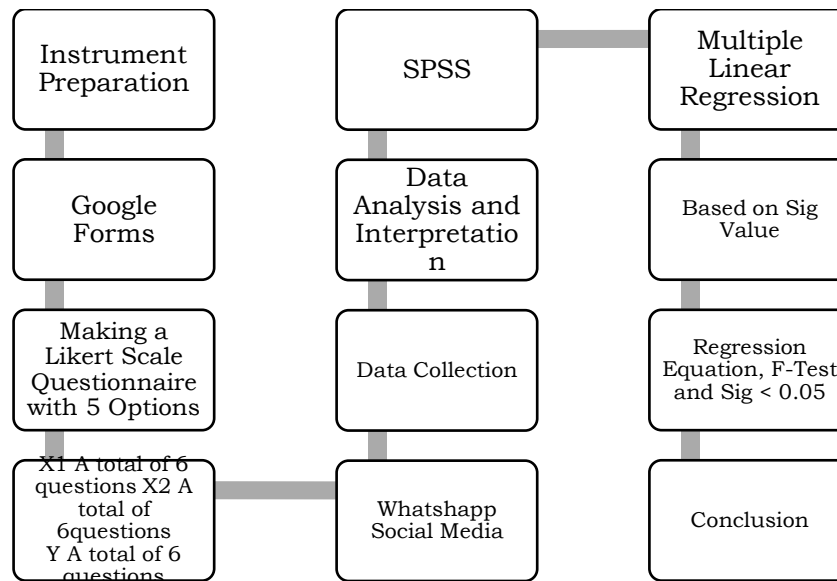


Figure 1. Research Procedure

This research consists of several stages. The first stage is to compile a questionnaire based on the indicators of the research variables that have been determined. This questionnaire aims to measure respondents' perceptions of QRIS payment flexibility and payment security, as well as its impact on their purchasing decisions in e-commerce or supermarkets. After the questionnaire is compiled, the second stage is to distribute the questionnaire to the selected respondents. The questionnaire was distributed online and offline to ensure diverse participation. The third stage is tabulating and analyzing the data. The data gathered from the questionnaire was processed and examined using descriptive statistical techniques and multiple linear regression tests with SPSS (Statistical Package for the Social Sciences) software. Descriptive statistical analysis techniques were used to provide summary of the attributes of the respondents and the spread of their answers. Multiple linear regression analysis tests were employed to examine the impact of QRIS payment flexibility and payment security on purchasing decisions. The criterion for drawing conclusions in this study is if the significance value ( $p$ -value)  $< 0.05$ , the null hypothesis ( $H_0$ ) is rejected, indicating statistical significance influence between The influence of QRIS payment flexibility and transaction security on buying decisions in electronic commerce or supermarkets.

The final stage is data interpretation and conclusion drawing derived from the findings of data analysis. The findings from data analysis are interpreted to understand the extent to which QRIS payment flexibility and payment security affect consumer buying decisions. In addition, the practical implications of the findings of this study will also be discussed to provide recommendations to e-commerce service providers and Supermarkets in improving their payment strategies.

### 3. RESULTS AND DISCUSSIONS

This study seeks to examine the effect of QRIS payment flexibility and transaction security on buying choices in e-commerce or supermarkets using quantitative methods. Data was collected through a questionnaire that applied a Likert scale with a value range of 1 to 5. The overall number of respondents participating in this study was 88 people, comprising of 27 men and 61 women. A total of 33 respondents utilize QRIS for needs in

e-commerce, while the other 55 respondents use it in supermarkets. The following are the results of data tabulation as per Figure 2.

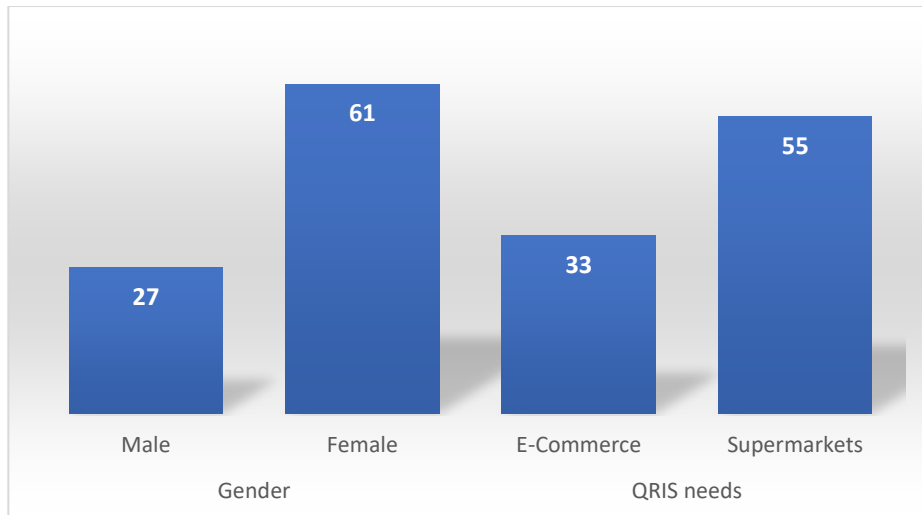


Figure 2. Respondent Distribution

The distribution of participants in Figure 2 provides an initial picture of QRIS usage preferences among consumers, which will be further analyzed in the study to see how payment flexibility and transaction security affect purchasing decisions on both types of platforms. Results analysis This research involved several stages in order to understand the effect of QRIS payment flexibility and the impact of transaction security on buying decisions in electronic commerce or supermarkets. The first stage involves preparing a questionnaire in accordance with the indicators of the research variables. The questionnaire that has been prepared is then distributed to respondents via social media as a data collection method. After data collection was completed, 88 respondents contributed to filling out the research questionnaire, followed by the tabulation stage (as shown in Figure 2) and data analysis. Data analysis, descriptive statistical methods are applied to provide an overview of the distribution of the data obtained. Furthermore, the multiple linear regression analysis test method was employed to examine the relationship between the influence of QRIS payment flexibility and transaction security on buying decisions in electronic commerce or supermarkets. SPSS software was chosen as the main analysis tool to support the data analysis process.

The criterion for drawing conclusions held in this study is If the significance value <0.05, then the null hypothesis (H<sub>0</sub>) is rejected. The rejection of H<sub>0</sub> suggests that there is a notable effect of the effect of QRIS payment flexibility and transaction security on buying decisions in electronic commerce or supermarkets. These findings are expected to make a valuable contribution to the literature and provide a foundation for business development for E-Commers or Supermarkets. The findings of descriptive statistics are presented in Table 1.

Table 1. Descriptive Statistics

	Minimum	Maximum	Mean	Std. Deviation	Variance
(X1)	36.67	100	81.8182	13.69152	187.458
(X2)	36.67	100	79.8864	14.12790	199.598
(Y)	36.67	100	81.5149	14.59449	212.999

Table 1 Describes the results of descriptive statistical analysis that the mean value of 81.81 indicates that overall, respondents gave a very positive assessment of

QRIS payment flexibility in influencing purchasing decisions in e-commerce or supermarkets. This figure indicates a significant level of satisfaction with the payment flexibility offered by QRIS, which in turn can encourage consumers to make more frequent purchases. The standard deviation of 13.69 indicates a notable variation among respondents' ratings. Although the majority of respondents gave positive assessments, there are notable differences in perceptions between one respondent and another.

The minimum value of 36.67 and the maximum value of 100.00 suggest a broad range of assessments, from very low to very high assessments. The variance of 187.45 further indicates that there is considerable disparity in respondents' assessment of QRIS payment flexibility. This suggests that while most respondents find the payment flexibility helpful, there is a small minority who may be less satisfied. Overall, this data shows that QRIS payment flexibility significantly and positively impacts buying decisions in electronic commerce or Supermarkets, but also highlights that there is room for improvement in fine-tuning such payment services to achieve more equitable satisfaction among consumers. Meanwhile, the results of the summary model analysis are explained in Table 2.

Table 2. Summary of the Model

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.776 <sup>a</sup>	.603	.593	9.30899

a. Predictors: (Constant), Transaction security, QRIS payment flexibility

Table 2 presents the results of the hypothesis test as indicated in the model summary. The R value of 0.776 suggests a robust relationship between QRIS payment flexibility and transaction security on buying decisions in electronic commerce or supermarkets. The R Square value of 0.603 suggests that 60.3% of the variation in purchasing decisions is attributable to QRIS payment flexibility and transaction security. Meanwhile, the Adjusted R Square value of 0.593 indicates that this model exhibits a strong adjustment to the number of predictor variables used. Thus, this model is quite effective in explaining the impact of the two independent variables on the dependent variable.

The standard error of the estimate of 9.30899 indicates how much the data deviates from the regression model. Although there is a slight deviation, this value is still acceptable in the context of this study. Overall, these results show that QRIS payment flexibility and transaction security have a significant contribution in influencing purchase buying choices in electronic commerce or supermarkets. This study confirms the importance of both factors in increasing consumer convenience and trust when making transactions on digital platforms. Efforts to improve payment flexibility and security can be an effective strategy for e-commerce and supermarket players in attracting more consumers. The findings from the ANOVA analysis are presented in Table 3.

Table 3. ANOVA<sup>a</sup>

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	11165.051	2	5582.525	64.421	<,001 <sup>b</sup>
	Residual	7365.867	85	86.657		
	Total	18530.918	87			

a. Dependent Variable: Purchase Decision

b. Predictors: (Constant), Payment Security, QRIS Payment Flexibility

Table 3 displays the findings of the ANOVA analysis which shows that the regression model used to assess the effect of QRIS payment flexibility and transaction security on purchasing decisions is significant. The F value of 64.421 with a significance value of less than 0.001 indicates that the regression model involving the two predictor variables, namely (QRIS payment flexibility and transaction security) as a whole is significant in explaining the variability of purchasing decisions. This study shows

indicating a notable correlation between one of the independent variables, namely (QRIS payment flexibility or transaction security) and purchasing decisions.

The Sum of Squares for the regression of 11,165.051 and for the residual of 7,365.867 indicates that this the model can account for a substantial portion of the variance in purchasing decisions. With 2 degrees of freedom for regression and 85 for residuals, the Mean Square for regression is 5,582.525 and for residuals is 86,657. These results reinforce the findings of previous studies that transaction security has a significant influence on purchasing decisions, while QRIS payment flexibility has a smaller influence. So that the findings of this study underscore the significance of improving security aspects in transactions to encourage consumer purchasing decisions in e-commerce and supermarkets. While The interpretation of the coefficient analysis is provided in Table 4.

Table 4. Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	15.205	6.256		2.430	.017
QRIS payment flexibility	.115	.116	.108	.995	.322
Transaction security	.712	.112	.689	6.357	<.001
a. Dependent Variable: Purchase decision					

Table 4 shows that the QRIS payment flexibility variable does not demonstrate a notable impact on purchasing decisions. This is indicated by the unstandardized regression coefficient (B) of 0.115, with a t-value of 0.995 and a significance value of 0.322. This value indicates that QRIS payment flexibility has no meaningful contribution in influencing consumer purchasing decisions in the context of this study. Although payment flexibility is a crucial element in the transaction process, the findings of this study indicate that consumers prioritize transaction security aspects over payment flexibility in making purchasing decisions.

Based on the results of the regression analysis presented in the Coefficients table, it is evident that the security of transactions variable significantly impacts buying decisions in electronic commerce or supermarkets. The unstandardized regression coefficient (B) for this variable is 0.712, with a t value of 6.357 and a significance value of less than 0.001. This shows that every one unit increase in transaction security will increase purchasing decisions by 0.712 units, with a very high level of significance. Thus, transaction security can be said to be a very important factor and has a significant impact on determining consumer purchasing decisions.

The discussion of the findings of this study shows some important findings regarding the effect of QRIS payment flexibility and transaction security on consumer purchasing decisions in e-commerce or supermarkets. In this study, the results of descriptive statistics show that the average respondent's assessment of QRIS payment flexibility is 81.81, which indicates a high level of satisfaction. The standard deviation of 13.69 shows that there is significant variation among respondents' ratings. The wide range of values from 36.67 to 100 shows that while most respondents gave a positive assessment, there are notable differences in perception among them. The variance of 187.45 also indicates that there is considerable disparity in respondents' assessment of QRIS payment flexibility.

The summary model results show that the R value of 0.776 indicates a strong relationship between QRIS payment flexibility and transaction security with purchasing decisions. The R Square value of 0.603 indicates that 60.3% of the variability in purchasing decisions can be explained by these two variables. The Adjusted R Square of 0.593 shows that this model has a good adjustment to the number of predictor variables

used. The standard error of the estimate of 9.30899 indicates how much the data deviates from the regression model, which is still acceptable in the context of this study.

The ANOVA analysis shows that the regression model used is significant with an F value of 64.421 and a significance value of less than 0.001. This shows that the regression model involving QRIS payment flexibility and transaction security is overall significant in explaining the variability of purchase decisions. However, the results in the Coefficients table show that QRIS payment flexibility does not have a significant influence on purchasing decisions. The unstandardized regression coefficient (B) for QRIS payment flexibility is 0.115 with a t-value of 0.995 and a significance value of 0.322. On the other hand, the transaction security variable has a significant influence on purchasing decisions with an unstandardized regression coefficient (B) of 0.712, a t-value of 6.357, and a significance value of less than 0.001.

These results can be compared with previous research to get a more comprehensive picture of related topics. Such as research conducted by Widayanto, et al, (2023) The study discovered that transaction security significantly impacts consumer purchasing decisions on e-commerce platforms. The results of this study also show that although payment flexibility is important, transaction security has a greater influence on purchasing decisions.

Overall, this study supports previous findings that transaction security is a very important A crucial factor in shaping consumer purchase decisions in e-commerce or supermarkets. QRIS payment flexibility, while important, does not have a significant influence in this context. Therefore, efforts to improve transaction security can be an effective strategy for e-commerce and supermarket players in attracting more consumers ( Guntara, et al, 2023). The findings also highlight the importance of continuously developing and improving payment systems to increase consumer satisfaction and trust.

#### 4. CONCLUSION

Based on the data analysis conducted, the conclusion drawn is that payment flexibility using QRIS and the security of transactions have a significant influence on purchasing decisions in electronic commerce or supermarkets. The analysis results show that these two variables contribute 60.3% to purchasing decisions, as evidenced by an ANOVA F-value of 64.421 and a significance value of less than 0.001. These findings emphasize the importance of QRIS payment flexibility and transaction security as critical factors influencing consumer decisions in both e-commerce platforms and supermarkets. Despite its contributions, this study has limitations, including a regionally specific sample and a focus on only two variables, potentially limiting the generalizability of its findings. The limited sample size of 88 respondents, derived from a single region, may not represent the broader population of e-commerce and supermarket users at the national level. Furthermore, the study does not account for other external factors, such as product quality, customer service, or promotions, which could also significantly influence purchasing decisions. The findings provide theoretical contributions by expanding knowledge about the role of digital payment flexibility and transaction security in consumer purchasing decisions. Practically, this study highlights the importance for e-commerce providers and supermarkets to implement flexible and secure payment options to attract and retain customers. For instance, e-commerce platforms can enhance their systems by integrating more user-friendly and secure QRIS payment methods, while supermarkets can adopt advanced digital payment technologies to improve customer satisfaction and boost sales. Future research is recommended to address these limitations by incorporating a larger and more diverse sample, considering additional factors that influence purchasing decisions, and using qualitative methods, such as interviews or focus group discussions, to provide deeper insights into consumer

perceptions and experiences. These efforts will enhance the generalizability and depth of understanding, offering valuable directions for both academia and industry.

#### ACKNOWLEDGEMENTS

The author would like to thank the lecturers who have taught and guided the author wholeheartedly, for the author's best friends also thank you for your writing together all this time.

#### REFERENCES

- Aazh, H., Danesh, A. A., & Moore, B. C. J. (2021). Internal Consistency and Convergent Validity of the Inventory of Hyperacusis Symptoms. *Ear and Hearing*. <https://doi.org/10.1097/AUD.0000000000000982>
- Ardani, W. (2022). Pengaruh Digital Marketing Terhadap Perilaku Konsumen. *Jurnal Tadbir Peradaban*, 2(1), 40–47. <https://doi.org/10.55182/jtp.v2i1.102>
- Ariningsih, E. P., Wijayanti, W., & Prasaja, M. G. (2022). Intention to Use E-wallet Dilihat dari Perceived Usefulness, Perceived Ease of Use, Perceived Security, dan Trust. *Jurnal Maksipreneur: Manajemen, Koperasi, dan Entrepreneurship*. <https://doi.org/10.30588/jmp.v11i2.916>
- Change, G., Cimino, M., York, N., Alifah, U., Mayssara A. Abo Hassanin Supervised, A., Chinatown, Y., ... Change, G. (2021). Analisis faktor-faktor yang berpengaruh terhadap keputusan pembelian online platform E-commerce shopee ( studi kasus pada konsumen E-commerce shopee di kota Tegal). *Paper Knowledge . Toward a Media History of Documents*, 3(2), 18–138.
- Chaveesuk, S., Khalid, B., & Chaiyasoonthorn, W. (2021). Digital payment system innovations: A marketing perspective on intention and actual use in the retail sector. *Innovative Marketing*. [https://doi.org/10.21511/im.17\(3\).2021.09](https://doi.org/10.21511/im.17(3).2021.09)
- Dawam, A., & Ruski, R. (2022). Optimalisasi Integrated Digital Marketing dalam Strategi Pemasaran Home Industry di Desa Bandang Daja Kecamatan Tanjung Bumi. *Jurnal Pendidikan dan Kewirausahaan*, 10(2), 483–499. <https://doi.org/10.47668/pkwu.v10i2.403>
- Ediputra, M. R., & Amalyah, A. A. (2022). Analysis Factors Affecting Consumer Preferences in using Qris Payment In-Store. In *2022 5th International Conference on Computer and Informatics Engineering, IC2IE 2022*. <https://doi.org/10.1109/IC2IE56416.2022.9970086>
- Effendi, N.-. (2017). Studi Budaya Pasar Tradisional Dan Perubahan Gaya Hidup Masyarakat Pedesaan: Kasus Pasa Nagari Dan Masyarakat Nagari Di Propinsi Sumatera Barat. *Jurnal Antropologi: Isu-Isu Sosial Budaya*, 18(2), 105. <https://doi.org/10.25077/jantro.v18.n2.p105-120.2016>
- Gea, D., & Al-Azhar, N. I. (2021). The analysis of factors affecting using interest of QRIS payment systems on e-wallet applications in indonesia. In *Proceedings of 2021 International Conference on Information Management and Technology, ICIMTech 2021* (hal. 111–115). <https://doi.org/10.1109/ICIMTech53080.2021.9535036>
- Godio, M., & Beyer, K. (2019). Evaluation of force-based and displacement-based out-of-plane seismic assessment methods for unreinforced masonry walls through refined model simulations. *Earthquake Engineering and Structural Dynamics*. <https://doi.org/10.1002/eqe.3144>
- Jahrami, H., Trabelsi, K., Saif, Z., Manzar, M. D., BaHammam, A. S., & Vitiello, M. V. (2023). Reliability generalization meta-analysis of the Athens Insomnia Scale and its translations: Examining internal consistency and test-retest validity. *Sleep Medicine*. <https://doi.org/10.1016/j.sleep.2023.09.015>
- Kamalina, A. R. (2024). Penggunaan QRIS Makin Pesat, per April 2024 Tumbuh 194%. Diambil dari <https://finansial.bisnis.com/read/20240523/11/1767721/penggunaan-qrisk-makin-pesat-per-april-2024-tumbuh-194>
- Kristanty, D. N. (2024). Tren dan Tantangan Keamanan Bertransaksi dengan Qris dalam Era Transformasi Sistem Pembayaran Digital, 5(10), 3923–3933.
- Kumbara, V. B., Neldi, M., Diana, Y., & Ridwan, M. (2023). Determinasi preferensi konsumen, online customer review, kualitas website dan keamanan, terhadap kepuasan konsumen dengan kepercayaan konsumen sebagai pemediasi. *JPPPI (Jurnal Penelitian Pendidikan Indonesia)*, 9(4), 713. <https://doi.org/10.29210/020233528>

- Mageshkumar, G., Suthagar, S., Maher Shalal, D., Muruganatham, S., & Manoji, T. (2023). Flexi-Pay System for Public Transport Based on Passenger Comfort Using Global Positioning System. In *Lecture Notes in Networks and Systems* (Vol. 563, hal. 593–605). [https://doi.org/10.1007/978-981-19-7402-1\\_42](https://doi.org/10.1007/978-981-19-7402-1_42)
- Maylinda, S., & Sari, I. P. (2021). Optimalisasi Integrated Digital Marketing Dalam Strategi Pemasaran Umkm Imago Raw Honey. *JABE (Journal of Applied Business and Economic)*, 7(4), 521. <https://doi.org/10.30998/jabe.v7i4.9940>
- Nugraha, P. P. (2023). Korelasi Ramalan Joyoboyo Pasar Ilang Kumandange Terhadap Pemasaran Digital Di Era Marketing 4.0 Di Indonesia. *Bangun Rekaprima*, 9(1), 75. <https://doi.org/10.32497/bangunrekaprima.v9i1.4475>
- Putri, I. D., Hindrayani, A., & Totalia, S. A. (2023). Faktor-Faktor Yang Memengaruhi Penerapan Metode Pembayaran Digital Pada Usaha Mikro, Kecil, dan Menengah (UMKM) di Surakarta Dalam Menghadapi Era Revolusi Industri 4.0. *Jurnal Pendidikan Ekonomi (JUPE)*, 11(2), 202–211. <https://doi.org/10.26740/jupe.v11n2.p202-211>
- Putri, S. A., & Rahmanto, D. N. A. (2023). Analisis Efektivitas Penggunaan Quick Response Code Indonesian Standard (QRIS) sebagai Alat Pembayaran Non Tunai pada Bank Syariah Indonesia KCP Godean 2. *El-Mal: Jurnal Kajian Ekonomi & Bisnis Islam*, 5(1), 456–476. <https://doi.org/10.47467/elmal.v5i1.3992>
- Qiao, G., Pan, W., Chen, J., & Liu, Y. (2010). E-commerce application system security policy. In *Proceedings of the 2010 IEEE International Conference on Progress in Informatics and Computing, PIC 2010* (Vol. 2, hal. 1233–1235). <https://doi.org/10.1109/PIC.2010.5687915>
- Rangga Gelar Guntara, Muhammad Naufal Nurfirmansyah, & Ferdiansyah. (2023). Blockchain Implementation in E-Commerce to Improve The Security Online Transactions. *Journal of Scientific Research, Education, and Technology (JSRET)*, 2(1), 328–338. <https://doi.org/10.58526/jsret.v2i1.85>
- Rosa, A., Iisnawati, I., & Daud, I. (2019). Key Factors Analysis of E-Commerce and Marketplace Purchasing Decision in Palembang. *Sriwijaya International Journal of Dynamic Economics and Business*, 347–362. <https://doi.org/10.29259/sijdeb.v2i4.347-362>
- Sari, I. P. (2024). Adoption of Qris ( Quick Response Code Indonesian Standard ) through a Strategy to Increase the Financial Literacy of UMKM Players in the City of Solo Adopsi Qris ( Quick Response Code Indonesian Standard ) Melalui Strategi Peningkatan Literasi Keuangan P, 2(6), 931–942.
- Sayatman, S., Ramadhani, N., & Alamin, R. Y. (2018). Pengembangan Desain Kemasan Produk UMKM Olahan Hasil Laut di Kecamatan Paciran Kab. Lamongan dalam Rangka Meningkatkan Daya Saing dan Perluasan Pemasaran. *Sewagati*, 2(2). <https://doi.org/10.12962/j26139960.v2i2.4642>
- Shandrivska, O., & Shynkarenko, N. (2020). Applied Risk Assessment in the System of Socio-Economic Processes in Cyberspace. *Journal of Lviv Polytechnic National University. Series of Economics and Management Issues*, 4(2), 94–105. <https://doi.org/10.23939/semi2020.02.094>
- Sholichin, A. S., & Wisnalmawati, W. (2021). The Effect Of Price, Transaction Security, Online Consumer Review, and Viral Marketing on Purchase Decision in E-Commerce Shopee. *Jurnal Riset Ekonomi Manajemen (REKOMEN)*, 4(2), 121–132. <https://doi.org/10.31002/rn.v4i2.3873>
- suheriadi. (2024). BI Targetkan Pengguna QRIS Tembus 55 Juta di 2024. Diambil dari <https://www.fortuneidn.com/finance/suheriadi/pengguna-qr-is-ditargetkan-tembus-55-juta-di-2024>
- Tarantang, J., Awwaliyah, A., Astuti, M., & Munawaroh, M. (2019). Perkembangan Sistem Pembayaran Digital Pada Era Revolusi Industri 4.0 Di Indonesia. *Jurnal Al-Qardh*, 4(1), 60–75. <https://doi.org/10.23971/jaq.v4i1.1442>
- Taufik, M. M. (2015). Ketersediaan Areal Parkir, Kelengkapan Barang, Lokasi, Harga dan Kualitas Layanan Pengaruhnya Terhadap Keputusan Pembelian Sebagai Variable Intervening Minat Konsumen Berkunjung pada Minimarket Alfamart di Kotamadya Jakarta Selatan. *Jurnal Ekonomi dan Manajemen*, 4(2), 1–24. Diambil dari <https://journal.budiluhur.ac.id/index.php/ema/article/view/317/261>
- Tuzzahroh, F., & Laela, S. F. (2022). Sharia Audit and Shariah Compliance of Islamic Financial Institutions: A Bibliometric Analysis. *Jurnal Ekonomi Syariah Teori dan Terapan*, 9(6), 815–833. <https://doi.org/10.20473/vol9iss20226pp815-833>
- Widayanto, M. T., Haris, A., & Syarifah, L. (2023). Analisis Faktor-Faktor Yang Mempengaruhi

- Keputusan Pembelian. *Manajemen dan Kewirausahaan*, 4(1), 29–40.  
<https://doi.org/10.53682/mk.v4i1.5821>
- Zarkasyi, Z. (2022). Etika Profesi Dalam Bidang Teknologi Informasi. *Jurnal Teknologi Terapan and Sains 4.0*, 3(1), 719. <https://doi.org/10.29103/tts.v3i1.8870>
- Zuniarti, I., Yuniasih, I., Martana, I. K., Setyaningsih, E. D., Susilowati, I. H., Pramularso, E. Y., & Astuti, D. (2021). The effect of the presence of e-commerce on consumer purchasing decisions. *International Journal of Data and Network Science*, 5(3), 479–484.  
<https://doi.org/10.5267/j.ijdns.2021.3.005>