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Factors Forming E-Service Satisfaction of PJP QRIS on Micro Business Merchants in Bandung City with E-Servqual Approach and E-Service Satisfaction Model

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Abstract

This research aims to identify the factors shaping electronic service satisfaction (e-service satisfaction) among micro business merchants in Bandung City using QRIS payment service providers (PJP). The study employs the E-Servqual and E-Service Satisfaction Model. Data were collected through surveys from 330 respondents who are QRIS users in micro businesses. The analysis method used is Exploratory Factor Analysis (EFA) to identify the most influential dimensions of e-service quality impacting user satisfaction. The results indicate four main factors that influence e-service satisfaction: reliability, responsiveness, assurance, and overall satisfaction. The study also finds a high level of QRIS adoption among micro-business merchants, with a preference for non-bank service providers. The research recommends that QRIS providers continue enhancing service quality, particularly in terms of response speed, system security, and reliability, to improve customer satisfaction and merchant loyalty.

Keywords : *EFA, QRIS, MSME, E-Servqual, E-Service Satisfaction*

INTRODUCTION

One of Indonesia's most important payment gateways is now known as QRIS, or the Quick Response Code Indonesian Standard. The Indonesian Payment System Association (ASPI) (ASPI, 2022) states that in 2022, the volume and nominal performance of QRIS transactions at merchants throughout Indonesia has increased. In addition, the number of merchants also grew 112.8% (yoy). In terms of volume and nominal QRIS transactions in Indonesia in 2021-2022, it is dominated by the micro, small and medium enterprises (MSMEs) sector. In West Java province, based on Bank Indonesia's West Java Province Economic Report (Bank Indonesia Report, 2023), non-cash payment transactions with QRIS showed a significant increase along with the increasing acceptance of West Java people for non-cash payments and the formation of people's lifestyle for digital transactions. The nominal QRIS transactions in West Java in the third quarter of 2023 reached Rp 11 trillion. The trend in the number of QRIS merchants in West Java grew positively by 38.06% (6.2 million merchants) compared to the national 34.24%. Another interesting thing, the number of new QRIS merchants in West Java also grew positively by 141.11% compared to the national growth of 21.78%. Geographically, QRIS merchants in West Java are dominated by Bandung City, amounting to 1.7 million merchants (28.85% of total merchants in West Java). Based on business scale, micro businesses dominate the QRIS market share in West Java, reaching 53.46% (3.31 million merchants). BI will continue to strive to realize the vision of West Java Province to become a Digital Province, one of which is by optimizing the expansion of payment digitization through QRIS both in modern and traditional shopping areas with QRIS standards and services with the principle of "UNGGUL", namely UNiversal,

GampanG, Untung and Langsung (ASPI, 2021) (Bank Indonesia, 2021).

To support optimal service to QRIS merchants, in the ASPI Provisions (KASPI) in 2022 (ASPI, 2023), it is stated that the obligations of Payment Service Providers (PJP) QRIS, including educating merchants and users by paying attention to the principles of consumer protection and cooperation mechanisms with merchants as stipulated in BI regulations in the field of payment systems and consumer protection. PJP QRIS is obliged to adjust educational materials with industry developments and applicable provisions as well as procedures and procedures owned by each PJP QRIS.

One of the avenues via which businesses transact with their clients is the Internet, which they use for websites, applications, and other purposes. The corporation must switch from an e-commerce to an e-service model for its transactions if it wants its clients to embrace its online channel. Businesses must know how consumers perceive and assess their offerings to deliver higher-quality customer care. Depending on their opinions of the technology the business has adopted, customers' evaluations of its acceptance and utilization vary significantly (Parasuraman et al., 2005). As stated differently, client attributes impact the measurement of the optimal performance level of the company's website, indicating the more excellent e-service quality that customers desire. In line with research (Zhang, et al., 2006) e-services have great potential to improve service quality and simultaneously create significant savings for service providers. The use of electronic services, in many organizations is quite successful in opening up new revenues, reducing costs, increasing customer satisfaction, and attracting new customers (Yang, et al., 2003).

Although e-services have good and profitable potential, various literatures state that the effectiveness of e-services provided depends on the quality of service, as well as the level of satisfaction felt by customers when interacting or transacting with the system (Parasuraman, et al., 2005), (Zhang, et al., 2006), (Yang, et al., 2003). So, companies must be able to meet increasing customer expectations and adapt to evolving features.

On the other hand, the development of technology has an impact on decreasing direct interaction with customers (Zavareh, et al., 2012). With the reduction of direct interaction, companies need to examine the role of technology, shopping transactions and product factors to build e-service satisfaction. Service provider companies must have knowledge of how to keep customers satisfied with the electronic services they provide. In line with research (Aly Shared H, 2019) in the context of online banking, there is a strong relationship and influence between e-service quality and e-service satisfcation, one of the determining factors for success in online banking is customer satisfaction. However, to provide products and services that meet the needs of their customers, banks need to utilize various media. So, one of the important things for online banking is the need for services that are able to exceed their expectations, so banking customers feel satisfied. In another online banking context (Amin, M, 2016), supports that the higher the level of

internet banking service quality will significantly affect the high level of e-service satisfaction.

With this research, PJP QRIS in Bandung City must continue to strive to improve the quality of QRIS electronic services to develop customer satisfaction (merchants), increase retention rates and attract new merchants.

METHOD

This research seeks to explore and develop alternative electronic service satisfaction measuring instruments by using the PJP QRIS E-Servqual methodology and the E-Service Satisfaction Model to analyze the elements that make up electronic service satisfaction (merchants from PJP QRIS) in Bandung City. The following is a conceptual model depiction of this research:

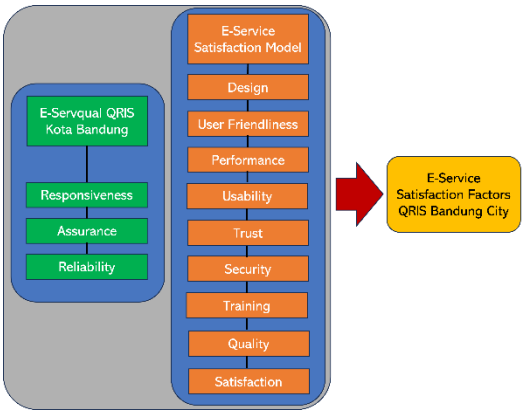

Figure 1. Conceptual Research Model

In line with research (Zavareh, et al., 2012), (Aly Shared H, 2019), (Amin, M, 2016), (Taherdoost & Madanchian, 2021), (Zemblyte, 2015), (Agrawal, et al., 2019), (Li, et al., 2021), Khan, et al., (2019), (Singh, 2019), (Zhou, et al., 2018), e-service quality is an important factor and has a significant positive effect on e-service satisfaction. If the dimensions of e-service quality are continuously improved by service providers, the potential for customer satisfaction with electronic services will increase (Khan, et al., 2019), (Singh, 2019), (Zhou, et al., 2018). Although these studies are in different contexts, with different approaches, these researchers suggest that they can be developed in other fields of electronic services and other research locations.

An exploratory factor analysis (EFA) methodology was used with quantitative methodologies to perform this research. In research (Parasuraman, et al., 2005), (Amin, M, 2016), (Taherdoost & Madanchian, 2021), (Ashila Dwiyanisa, et al., 2024), (Zemblyte, 2015), (Taherdoost, 2020), (Agrawal, et al., 2019), (Li, et al., 2021), Khan, et al., (2019), (Singh, 2019), (Zhou, et al., 2018) EFA approach, 2021), Khan, et al., (2019), (Singh, 2019), (Zhou, et al., 2018) Items are subjected to the EFA technique to gather and identify the components comprising electronic service satisfaction dimensions. The context of this study

is Bandung City's microbusiness PJP QRIS merchants. The dimension-forming objects are then rearranged and grouped from the remaining items through a series of iterations.

Three sections make up the questionnaire:

Section A examined the respondent's profile, Section B evaluated the PJP QRIS's e-service quality dimensions, Section C examined the elements of the E-Service Satisfaction Model.

A five-point Likert scale, ranging from (1) Strongly Disagree (STS) to (5) Strongly Agree (SS), was used by respondents to indicate how much they agreed with each statement. The questionnaire included 66 items in total, broken down as follows:

1. PJP QRIS Electronic Service Quality (Ashila Dwiyanisa, et al., 2024) with three dimensions, namely responsiveness (14 items), assurance (5 items) and reliability (17 items).
2. E-Service Satisfaction Model (Taherdoost, 2020) with eight dimensions, namely design (4 items), user friendliness (3 items), performance (7 items), usability (4 items), trust (3 items), security (4 items), training (2 items) and satisfaction (3 items).

Data collection was carried out using questionnaires distributed to microbusiness QRIS vendors in the city of Bandung. According to Hair et al. (2019), Hamed et al. (2022), and Phakiti (2018), up to 330 respondents were considered when determining the sample size. Non-probability sampling combined with a judgmental sample technique forms the basis of the sampling strategy. Samples are selected according to predetermined standards, namely microbusiness QRIS merchants, by Indonesian law No. 20 of 2008 addressing MSMEs 2008.

Additionally, the following steps were taken in order to process and analyze the EFA: (1) determine if the sample size was adequate using KMO and Bartlett's Test; (2) choose the principal axis factoring (PAF) factor extraction method; (3) retain the factor using eigenvalues or the scree test; (4) choose the rotation methods using oblique rotations; and (5) interpret and label the factors (Hamed et al., 2022).

RESULTS AND DISCUSSION

Data processing was done based on the answers to questionnaires used for data collection. Three hundred thirty-six respondents answered the questionnaire provided both offline and online. However, it was determined that 330 replies from the processed respondents were necessary to meet the requirements of this study. The study's respondents were Bandung City merchants or microbusiness owners. Version 25 of the SPSS program was used to process the data. Descriptively, the profile of respondents in this study (see Table 1, data sorted from highest to lowest percentage), namely:

Table 1. Profile of Research Respondents

Respondent Profile		**Percentage (%)**
A	**Line of Business**	
1	Food	23,94
2	Food & Beverage	23,64
3	Services	9,39
4	Drinks	8,18

5	Finished goods	7,88
6	Restaurant/dining house	5,15
7	Goods & services	4,85
8	Fashion/boutiques	4,55
9	Retail	2,42
10	Printing and reproduction	2,42
11	Food ingredients	2,12
12	Skin	1,52
13	Other transportation equipment	1,52
14	Pharmacies	0,91
15	Machine repair & installation	0,30
16	Pet shop	0,30
17	Education	0,30
18	Wholesale	0,30
19	Wickerwork/other crafts	0,30
B	**Business Status**	
1	No legal entity yet	34,55
2	Limited liability partnership (CV)	21,21
3	More	20,00
4	Individual Company (PO)	8,79
5	Trading Company (PD) / Trade Business (UD)	5,76
6	In the process of submission	5,15
7	Franchise	2,42
8	Limited Liability Company (PT)	0,91
9	Foundation	0,61
10	Cooperative (Koperasi)	0,30
11	Home Industry Food Permit (PIRT Permit)	0,30
C	**Business Turnover Range (per Month)**	
1	IDR 5 - 10 million	45,45
2	IDR 11 - 25 million	40,00
3	< 5 million	8,18
4	> 25 million	6,36
D	**Business Timeframe**	
1	5 - 10 years	43,03
2	11 - 15 years	23,94
3	> 15 years	20,61
4	< 5 years	12,42
E	**Timeframe for QRIS Media Adoption at Businesses**	
1	1 - 5 years	71,52
2	< 1 year	28,48
F	**QRIS Payment Service Provider (PJP) Category**	
1	Non-Bank	61,52
2	Bank & Non-Bank	30,91
3	Bank	7,58
G	**Age Range of Entrepreneurs**	
1	> 40 years	41,52
2	29 - 34 years old	28,48
3	35 - 40 years	24,85
4	23 - 28 years	4,55
5	17 - 22 years	0,61
H	**Domicile (Area of Residence) Entrepreneur**	
1	Bandung City	37,58
2	Cimahi City	31,52

3	West Bandung Regency	14,85
4	Bandung Regency	14,55
5	Jakarta	0,61
6	Sumedang	0,30
7	Subang	0,30
8	Rumbai	0,30
I	**Employer Gender**	
1	Male	66,97
2	Female	33,03
J	**Entrepreneur Education**	
1	Bachelor	42,73
2	Secondary School/equivalent	33,64
3	Diploma	14,55
4	Master	3,33
5	Junior High School/equivalent	3,03
6	Elementary school/equivalent	1,21
7	A/B/C Package School	0,91
8	Doctoral	0,30
9	Madrasah	0,30
TOTAL (330 RESPONDENTS)		**100**

Source: SPSS Data Processing Results (2024)

Based on the descriptive analysis, it was found that the three business sectors with the highest percentage were food (23.9%), food and beverages (23.6%), and beverages (8.2%), indicating that the majority of respondents are engaged in the food and beverage sector, either as producers or sellers, This business sector is the dominant sector in this study, which may reflect the characteristics of the city of Bandung which is famous for its culinary tourism destinations (Kemenparekraf, 2024).

In addition to the field of business, most respondents (34.5%) have a business without a legal entity, followed by entrepreneurs who run a business in the form of a limited liability partnership (CV) at 21.2%, and other groups at 20%, This shows that the majority of entrepreneurs do not have a strong formal legal form, and most operate independently or on a micro scale.

Most respondents reported that their turnover was in the range of Rp 5-10 million per month (45.5%), followed by those with turnover between Rp 11-25 million (40%), and those with turnover of less than Rp 5 million (8.2%), From this data it can be seen that most businesses are at the micro or small business level, with a relatively low range of monthly income.

The data shows that the majority of respondents (43%) have been running their businesses for between 5-10 years, while 23.9% have been running their businesses for 11-15 years, and only 20.6% have been in business for more than 15 years, indicating that the majority of entrepreneurs have sufficient experience in running a business, with most having been operating for more than 5 years.

The adoption of QRIS financial technology is one of the focuses in this study, In terms of the time span of QRIS adoption, it was found that most respondents (71.5%) had used adopted

QRIS for 1-5 years, while the other 28.5% had only adopted it for less than one year, This use of QRIS shows a fairly high level of technology adaptation among entrepreneurs, especially to support a more efficient payment system.

The QRIS PJP or QRIS Payment Service Provider used by the entrepreneurs is also an interesting variable to analyze, from the analysis results, 61.5% of respondents use Non-Bank providers, while 30.9% use a combination of Bank and Non-Bank, and only 7.6% adopt QRIS from Bank providers, this indicates a strong preference towards Non-Bank providers (such as OVO, DANA, GoPay, ShopeePay, and other fintech products), which may offer a more flexible solution and suit the needs of micro entrepreneurs.

In addition, from the results of the analysis, the majority of respondents were in the age group of more than 40 years (41.5%), followed by those aged between 29-34 years (28.5%), and the age group of 35-40 years as much as 24.8%, while the younger age groups, such as 17-22 years and 23-28 years, only amounted to a small number, indicating that the majority of entrepreneurs in this study are people who have been old enough and have sufficient experience in the business world.

Demographically, in terms of domicile, Bandung City is the location where the majority of respondents live (37.6%), followed by Cimahi City (31.5%), and West Bandung Regency (14.8%), This indicates that the entrepreneurs involved in this study are mostly from the region, which is considered to contribute greatly to the digital economy in West Java (Bank Indonesia Report, 2023), which also has the potential to influence the way they manage and develop their businesses. By gender, the majority of respondents are male (67%), while women only amount to 33%, This indicates a male dominance in the ownership and management of micro businesses in Bandung City, In addition, at the education level, the respondent profile shows that most entrepreneurs have a Bachelor's degree (42.7%), followed by those with a Secondary School education (SMA/SMK/equivalent) (33.6%), and a small number of others have a Diploma (14.5%), The number of respondents with Master's and Doctoral education has a very small percentage, only 3.3% and 0.3% respectively. This shows that although most entrepreneurs have pursued higher education, there are also a large number who only have secondary education.

Overall, the profile of respondents in this study shows that the majority are entrepreneurs in the food and beverage sector, are over 40 years old, male, and have a Bachelor's degree with their business turnover range mostly between IDR 5-25 million per month, and many have been in business for more than 5 years, In the adoption of QRIS technology is quite high, with most micro entrepreneurs in Bandung City preferring Non-Bank QRIS Payment Service Providers (PJPs). This profile provides a clear picture of the characteristics of entrepreneurs in the Bandung City area who contributed to this study.

The Bartlett's Test is used to determine the reliability of the factorial solution, and the findings of the KMO Test are used to evaluate the sample's suitability for factor analysis. According to Hair et al. (2019), Costello & Osborne (2005), and Roni & Djajadikerta (2021)

as references, Bartlett's Test value should ideally be less than 0.05, and the KMO value that is typically used as a benchmark is > 0.70. The KMO Test value is 0.876, and the Bartlett Test value is 0.000, based on the research findings in Table 2. This demonstrates that the study's sample is sufficient for factor analysis, falling into sufficient or suitable categories (Roni & Djajadikerta, 2021; Schreiber, 2021). The factorial solution is also regarded as credible.

Table 2. KMO and Bartlett's Test Result

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy,		,876
Bartlett's Test of Sphericity	Approx, Chi-Square	53909,057
	df	2016
	Sig,	,000

Source: SPSS Data Processing Results (2024)

According to (Hair, et al., 2019), a measure that indicates how well a variable (or item, as it is called in the studies of (Hamed, et al., 2022) and (Costello & Osborne, 2005) is recognized in the retained factors is the communalities value, which is the amount of variance explained by the factor loadings. In social studies, (Costello & Osborne, 2005), and (Roni & Djajadikerta, 2021) propose that the common communalities value ranges from 0.40-0.70. (Costello & Osborne, 2005) recommends the ideal value of communalities to be above 0.40. Meanwhile, (Hair, et al., 2019) recommends that the value of communalities and factor loading is also determined by the criteria for the number of samples used in the study. The results of this study, the communalities value (see Table 4), from a total of 66 items observed, there are two items, namely RESP12 and RESP13 which have communalities values below 0.30, for the sake of better factor formation, these items were removed (Hair, et al., 2019), (Costello & Osborne, 2005), and (Roni & Djajadikerta, 2021), so it was decided that the items processed were 64 items. Only one of the 64 examined items had a commonalities value of less than 0.40; the other 63 had values between 0.4 and 0.70. Referring to the references (Hair, et al., 2019), (Costello & Osborne, 2005), and (Roni & Djajadikerta, 2021), in this study, variables or items are considered good or meet the criteria for factor analysis.

Table 3. Communalities Result

Communalities		
	Initial	Extraction
RESP1	,986	,845
RESP2	,993	,912
RESP3	,997	,853
RESP4	,956	,885
RESP5	,900	,650
RESP6	,972	,882

Communalities		
	Initial	Extraction
RESP7	,991	,938
RESP8	,998	,932
RESP9	,993	,858
RESP10	,992	,778
RESP11	,969	,850
RESP14	,913	,760
ASSURE1	,992	,474
ASSURE2	,992	,503
ASSURE3	,445	,379
ASSURE4	,977	,643
ASSURE5	,977	,715
RELI1	,995	,774
RELI2	,997	,820
RELI3	,993	,824
RELI4	,983	,833
RELI5	,997	,862
RELI6	,987	,830
RELI7	,991	,852
RELI8	,992	,821
RELI9	,996	,770
RELI10	,998	,870
RELI11	,995	,860
RELI12	,950	,613
RELI13	,993	,738
RELI14	,995	,829
RELI15	,980	,794
RELI16	,900	,714
RELI17	,963	,845
DESIGN1	,997	,823
DESIGN2	,996	,846
DESIGN3	,992	,848
DESIGN4	,995	,753
FRIEND1	,998	,887
FRIEND2	,999	,878
FRIEND3	,993	,863
PERF1	,984	,800
PERF2	,999	,889
PERF3	,998	,861
PERF4	,986	,812
PERF5	,991	,851
PERF6	,993	,849
PERF7	,979	,866
USAB1	,989	,837
USAB2	,986	,830
USAB3	,999	,844
USAB4	,998	,817
TRUST1	,963	,733
TRUST2	,988	,811
TRUST3	,987	,859
SECUR1	,991	,789
SECUR2	,988	,833

Communalities		
	Initial	Extraction
SECUR3	,996	,817
SECUR4	,992	,819
TRAIN1	,977	,698
TRAIN2	,976	,796
SATS1	,997	,799
SATS2	,752	,589
SATS3	,998	,819
Extraction Method: Principal Axis Factoring,		

Source: SPSS Data Processing Results (2024)

The foundation of the total variance approach is achieving a specific cumulative percentage of the total variation collected by the variables in order (see Table 4). The main objective of this approach is to ensure that the resulting factors have practical significance, i.e. they should be able to explain a meaningful amount of variance. Though some research indicates lower values, the social sciences advise that explaining 60% of the total variance is often deemed sufficient. However, statistical software has no universally agreed threshold (Hair et al., 2019). The number of components to keep is determined via eigenvalue tests and scree plots (as illustrated in Figure 2), per Yong & Pearce (2013) and Costello & Osborne (2005). Statistics software usually keeps factors that have eigenvalues higher than 1.0. Eight components had eigenvalues over 1.0 during the first round of data processing; however, multicollinearity developed, limiting SPSS iterations. The existence of multicollinearity can make it difficult to separate which variables are most related to a particular factor (Hair, et al., 2019), (Costello & Osborne, 2005), (Yong & Pearce, 2013) and (Roni & Djajadikerta, 2021). One recommendation for multicollinearity problems in EFA is to remove variables or items with factor loading < 0.30. This strategy is common in EFA to get a stronger and easier to interpret model (Hair, et al., 2019), (Costello & Osborne, 2005), (Yong & Pearce, 2013) and (Roni & Djajadikerta, 2021). Based on these references, it was decided to rework the data by deleting two items (RESP12 and RESP13) and deleting Factors 5-8, as well as reworking the result data with procedures that need to be adjusted in determining the number of factors (not using the default eigenvalues in the SPSS software, but by directly determining the number of factors of 4) so as to obtain Factors 1-4 which are more stable for better factor interpretation.

The reprocessed data (refer to Table 4) indicates that the eigenvalues of Factors 1-4 are higher than 1.0. 67.58% of the variance is explained by factor 1, 6.78% by factor 2, 4.08% by factor 3, and 2.91% by factor 4. These four variables account for 81.35% of the variation seen in the PJP QRIS electronic service satisfaction variable among Bandung City's microbusiness merchants. Numerous investigations have determined that this proportion is adequate (Hair et al., 2019). The screen test findings also show four data points

above the breakpoint (see Figure 2), indicating that these four parameters should be kept in the study.

Table 4. Eigen Values Result

Total Variance Explained							
	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings[a]
Factor	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	43,254	67,584	67,584	43,077	67,307	67,307	42,047
2	4,339	6,780	74,364	4,154	6,491	73,798	29,883
3	2,608	4,076	78,440	2,224	3,475	77,273	6,614
4	1,863	2,911	81,351	1,567	2,448	79,721	4,959
Extraction Method: Principal Axis Factoring,							
a, When factors are correlated, the sums of squared loadings cannot be added to obtain a total variance,							

Source: SPSS Data Processing Results (2024)

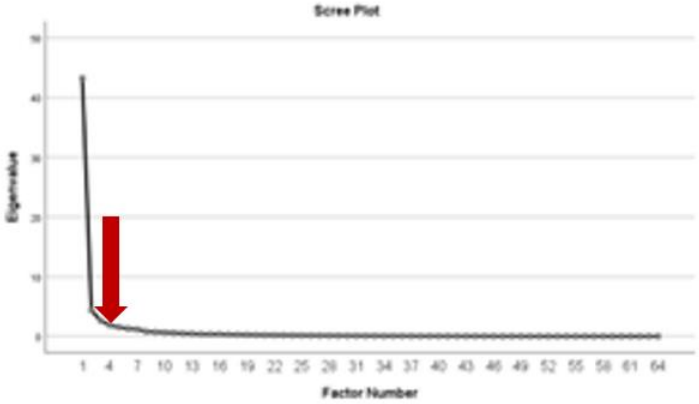

Figure 2. Scree Test Result

Source: SPSS Data Processing Results (2024)

Oblique rotation is used in this study, where factor or item loading is produced by analyzing the pattern matrix (Costello & Osborne, 2005). In this investigation, the data were processed twice. Three elements exhibit cross-loading in the second result, which is deemed stable and optimal based on the completed literature review (refer to Table 5). Cross-loading is permissible provided that each item's value is greater than the study's significance criterion of 0.30 (Hair et al., 2019), according to the literature (Hamed et al., 2022), (Yong & Pearce, 2013), and (Costello & Osborne, 2005). The necessary actions are as follows: (1) Square each factor loading and compute the ratio (ignoring the minus number) between the larger and smaller factor loadings; (2) based on the ratio calculation findings, a solution is chosen according to the following criteria: Ratios > 2.0 are classified as ignorable cross-loading, where smaller factor loadings are ignored (although significant) for interpretation purposes. Ratios between 1.0 and 1.5 are

classified as problematic cross-loading, where items with smaller factor loadings can be removed to achieve a simple structure. Ratios between 1.5 and 2.0 are classified as potential cross-loading. Cross-loading that occurs on ASSURE1 and ASSURE2 items which are ignorable cross-loading, it was decided to ignore the smaller factor loading, so ASSURE1 and ASSURE2 were grouped to Factor-4. In addition, the SATS2 item occurs problematic cross-loading which has a similar solution to ASSURE1-2, so the smaller factor loading can be ignored for the sake of interpretation, so the SATS2 item is decided to group to Factor-4 (see Table 6).

Table 5. Pattern Matrix Result

Pattern Matrix[a]						
	Factor				Cross-loading Ratio	Interpretation
	1	2	3	4		
RESP1		,878				
RESP2		,944				
RESP3		,943				
RESP4		,950				
RESP5		,820				
RESP6		,947				
RESP7		,958				
RESP8		,942				
RESP9		,893				
RESP10		,823				
RESP11		,926				
RESP14		,689				
ASSURE1			,341	-,543	(0,543^2) / (0,341^2) = 2,536	(> 2.0); negligible cross-loading, smaller factor loadings can be ignored for interpretation purposes.
ASSURE2			,353	-,555	(0,555^2) / (0,353^2) = 2,472	(> 2.0); negligible cross-loading, smaller factor loadings can be ignored for interpretation purposes.
ASSURE3			,629			
ASSURE4			,794			
ASSURE5			,842			
RELI1	,856					
RELI2	,873					
RELI3	,793					
RELI4	,836					
RELI5	,828					
RELI6	,822					
RELI7	,872					
RELI8	,841					
RELI9	,738					
RELI10	,815					
RELI11	,838					
RELI12	,622					
RELI13	,775					
RELI14	,813					
RELI15	,896					
RELI16	,718					

Pattern Matrix[a]						
	Factor				Cross-loading Ratio	Interpretation
	1	2	3	4		
RELI17	,785					
DESIGN1	,915					
DESIGN2	,871					
DESIGN3	,899					
DESIGN4	,866					
FRIEND1	,923					
FRIEND2	,922					
FRIEND3	,910					
PERF1	,895					
PERF2	,948					
PERF3	,892					
PERF4	,934					
PERF5	,953					
PERF6	,906					
PERF7	,867					
USAB1	,950					
USAB2	,920					
USAB3	,938					
USAB4	,905					
TRUST1	,927					
TRUST2	,926					
TRUST3	,947					
SECUR1	,970					
SECUR2	1,005					
SECUR3	,887					
SECUR4	,969					
TRAIN1	,836					
TRAIN2	,843					
SATS1				,738		
SATS2	,378			,428	(0,428^2) / (0,378^2) = 1,282	(1.0-1.5); problematic cross loading, smaller factor loading can be ignored
SATS3				,742		

Source: SPSS Data Processing Results (2024)

Table 6. Factor Naming based on Pattern Matrix Formed

Matrix Formed

Pattern Matrix[a]				
	Factor Naming			
	Reliability	**Responsiveness**	**Assurance**	**Satisfaction**
RESP1		,878		
RESP2		,944		
RESP3		,943		
RESP4		,950		
RESP5		,820		
RESP6		,947		
RESP7		,958		
RESP8		,942		

Pattern Matrix[a]				
	Factor Naming			
	Reliability	**Responsiveness**	**Assurance**	**Satisfaction**
RESP9		,893		
RESP10		,823		
RESP11		,926		
RESP14		,689		
ASSURE1				-,543
ASSURE2				-,555
ASSURE3			,629	
ASSURE4			,794	
ASSURE5			,842	
RELI1	,856			
RELI2	,873			
RELI3	,793			
RELI4	,836			
RELI5	,828			
RELI6	,822			
RELI7	,872			
RELI8	,841			
RELI9	,738			
RELI10	,815			
RELI11	,838			
RELI12	,622			
RELI13	,775			
RELI14	,813			
RELI15	,896			
RELI16	,718			
RELI17	,785			
DESIGN1	,915			
DESIGN2	,871			
DESIGN3	,899			
DESIGN4	,866			
FRIEND1	,923			
FRIEND2	,922			
FRIEND3	,910			
PERF1	,895			
PERF2	,948			
PERF3	,892			
PERF4	,934			
PERF5	,953			
PERF6	,906			
PERF7	,867			
USAB1	,950			
USAB2	,920			
USAB3	,938			
USAB4	,905			
TRUST1	,927			
TRUST2	,926			
TRUST3	,947			
SECUR1	,970			
SECUR2	1,005			
SECUR3	,887			

Pattern Matrix[a]				
	Factor Naming			
	Reliability	**Responsiveness**	**Assurance**	**Satisfaction**
SECUR4	,969			
TRAIN1	,836			
TRAIN2	,843			
SATS1				,738
SATS2				,428
SATS3				,742

Source: SPSS Data Processing Results (2024)

The factor matrix correlation results indicate a relationship between factors, with a minimum significance threshold of 0.30 (Hair, et al., 2019). The results in Table 8 show that overall, although there are several factors that correlate with each other (especially Factor-1 and Factor-2), most factors have a fairly low relationship with each other. This indicates that the four factors formed can be interpreted as different constructs and have unique contributions to the resulting factor model. The Oblimin Rotation method used allows for correlation between factors, and the results in this study show that some factors are related, while others are independent.

Table 8. Factor Correlation Matrix Result

Factor Correlation Matrix				
Factor	1	2	3	4
1	1,000	,712	,280	,272
2		1,000	,321	,086
3			1,000	-,137
4				1,000
Extraction Method: Principal Axis Factoring, Rotation Method: Oblimin with Kaiser Normalization,				

Source: SPSS Data Processing Results (2024)

Four primary variables were identified: Factor-1, which has 44 items; Factor-2, which has 12 items; Factor-3, which has 3 items; and Factor-4, which has five items (see Table 9). These findings are consistent with the data processing and literature reviews conducted for this study. After interpretation, the next step is to give names to these factors. Based on the pattern matrix results (see Table 5-6), the factors identified in this study are as follows:

Table 9. Factors Forming E-Service Satisfaction of QRIS Payment Service Provider (PJP) on Micro Business Merchants in Bandung City

Item	Factor Naming and Item Description	Factor Loading
Factor-1 "Reliability"		
RELI1	Merchants find the PJP QRIS system easy to use	,856
RELI2	PJP QRIS system provides reliable services	,873
RELI3	QRIS PJP system is merchant-friendly	,793
RELI4	QRIS PJP system provides fast service for merchants	,836
RELI5	The PJP QRIS system is designed to meet the needs of merchants	,828
RELI6	QRIS PJP system is responsive to merchant requests	,822
RELI7	The PJP QRIS system is designed with the best interests of merchants in mind	,872
RELI8	PJP QRIS website/app protects information about merchant account and transaction data	,841
RELI9	The PJP QRIS system provides sufficient information	,738

Item	Factor Naming and Item Description	Factor Loading
RELI10	The information provided by the PJP QRIS system is reliable	,815
RELI11	Merchant orders/submissions are quickly confirmed and stored by PJP QRIS	,838
RELI12	In the event of a problem, it is possible to speak to a PJP QRIS concrete employee (contact details are provided on the PJP QRIS website/app).	,622
RELI13	PJP QRIS does not share merchants' personal information with other websites	,775
RELI14	The ability of PJP QRIS to deliver the promised service prudently and consistently/stably	,813
RELI15	Information provided by the current PJP QRIS system	,896
RELI16	Good reputation and image of PJP QRIS	,718
RELI17	Through the PJP QRIS system, merchants get	,785

Item	Factor Naming and Item Description	Factor Loading
	the information they need on time	
DESIGN1	Merchants are satisfied with the e-service design of PJP QRIS	,915
DESIGN2	PJP QRIS website/application is logically organized and suits the anticipated needs of merchants	,871
DESIGN3	Merchants trust that PJP QRIS e-services will be used in the best interest of merchants	,899
DESIGN4	PJP QRIS e-service displays information attractively	,866
FRIEND1	Learning to use PJP QRIS e-services is easy for merchants	,923
FRIEND2	PJP QRIS e-service is easy to use	,922
FRIEND3	Easy to do what merchants want	,910
PERF1	PJP QRIS e-services deliver products/services in a way that merchants prefer	,895
PERF2	Quick to use PJP QRIS e-services	,948

Item	Factor Naming and Item Description	Factor Loading
PERF3	Merchants successfully use PJP QRIS e-services to do their work	,892
PERF4	Not too expensive to use PJP QRIS e-services	,934
PERF5	PJP QRIS e-service provides services in a timely manner	,953
PERF6	PJP QRIS e-service makes information very accessible	,906
PERF7	PJP QRIS e-services can be customized to meet various needs	,867
USAB1	Merchants accomplish their tasks easier and faster with PJP QRIS e-services	,950
USAB2	Using PJP QRIS e-services improves the quality of work merchants do	,920
USAB3	Using PJP QRIS e-services is very helpful and influential	,938
USAB4	The advantages of e-services are very important for merchants	,905
TRUST 1	Merchants feel confident that the legal	,927

Item	Factor Naming and Item Description	Factor Loading
	and technological structure adequately protects them from problems with the PJP QRIS e-service	
TRUST 2	PJP QRIS e-services have the ability to perform the promised services reliably and accurately	,926
TRUST 3	In general, PJP QRIS e-services are robust and secure	,947
SECUR 1	Merchants trust that confidential information is kept secure	,970
SECUR 2	There are appropriate procedures in PJP QRIS e-services to prevent accidental data loss	1,005
SECUR 3	When using PJP QRIS e-services, merchants are assured that certain managerial and technical procedures are in place to protect merchants' personal information	,887
SECUR 4	In the PJP QRIS electronic service, if a certain transaction is	,969

Item	Factor Naming and Item Description	Factor Loading
	carried out, it can never be rejected by any party.	
TRAIN 1	Merchants have received training from the QRIS PJP to use the e-service	,836
TRAIN 2	Merchants will use PJP QRIS e-services if they receive training on how to use them	,843
Factor-2 "Responsiveness"		
RESP1	PJP QRIS website/app provides useful and reliable information	,878
RESP2	PJP QRIS website/app makes it easy to find what I need	,944
RESP3	Information on PJP QRIS website/application is well organized, accurate and up-to-date	,943
RESP4	PJP QRIS website/application loads its pages quickly and easily	,950
RESP5	PJP QRIS website/app available 24/7 for business activities	,820
RESP6	There is a good search system in PJP	,947

Item	Factor Naming and Item Description	Factor Loading
	website/application (search menu, FAQ, etc.)	
RESP7	PJP QRIS website/application is easy to use	,958
RESP8	PJP QRIS website/application is well organized and easily accessible	,942
RESP9	PJP QRIS website/app provides information on service pricing, description, instructions etc.	,893
RESP10	PJP QRIS is honest about its offerings	,823
RESP11	PJP QRIS website/application enables quick transaction completion	,926
RESP14	PJP QRIS makes accurate services (accurate consumer transaction records, accurate accounts, etc.,)	,689
Factor-3 "Assurance"		
ASSURE3	QRIS PJPs offer clear product return/service recovery policies and warranties	,629

Item	Factor Naming and Item Description	Factor Loading
ASSURE4	PJP QRIS handles issues quickly	,794
ASSURE5	PJP QRIS' ability to solve problems and to answer questions	,842
Factor-4 "Satisfaction"		
ASSURE1	PJP QRIS compensates for the problems it creates	-,543
ASSURE2	PJP QRIS compensates when what is ordered/proposed does not materialize on time	-,555
SATS1	Overall, merchants are very satisfied with the PJP QRIS e-service	,738
SATS2	Merchants are satisfied with their previous experience using PJP QRIS e-services	,428
SATS3	Overall, the effect of using PJP QRIS e-services makes merchants feel satisfied	,742

CONCLUSION

The conclusion of this study outlines four main factors that influence e-service satisfaction among micro business merchants using PJP QRIS in Bandung City: reliability, responsiveness, assurance, and satisfaction.

Reliability refers to the ability of a service to consistently deliver the expected performance. This encompasses service reliability, the system's

capability to provide accurate information, and the consistency in handling transactions.

Responsiveness pertains to the service provider's capacity to address user needs promptly and effectively. This includes the speed of transaction completion, the availability of necessary information, and the ease of access to QRIS services.

Assurance involves the safety and trust that the service instills in users. It encompasses the service provider's ability to manage complaints and assure the quality of the service offered.

Satisfaction measures the overall contentment users feel towards the service and the compensation received in case of issues. It reflects the user's experience with the e-service and its impact on their overall comfort and satisfaction.

The findings align with previous research, highlighting that customer happiness is significantly affected by the quality of electronic services, particularly in digital transactions utilizing QRIS.

However, this study does have some limitations. The limited number of respondents from the Bandung City area suggests that generalizing these results to other regions should be approached with caution. Additionally, the study relies solely on Exploratory Factor Analysis (EFA) without confirmation from Confirmatory Factor Analysis (CFA), indicating a need for further research to bolster the validity of these findings.

For future research, it is advisable to broaden the scope to include other regions in Indonesia and increase the sample size to obtain a more comprehensive perspective. Moreover, employing CFA or alternative methods could yield more robust results in developing a valid and reliable electronic service quality model. Future studies might also delve into additional dimensions of e-service satisfaction to better understand the factors influencing user satisfaction in the realm of digital services.

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