4.228-JCB

By Ashila Dwiyanisa

WORD COUNT	7468	TIME SUBMITTED	10-JAN-2024 03:21PM
		PAPER ID	106048217

Jurnal Computech & Bisnis, Volume 17 No. 2, December 2023, 125-144
ISSN (print): 1978-9629, ISSN (online): 2442-4943

Factors Forming the Quality of Electronic Services of Payment System Service Providers (PJSP) *QRIS* on Micro Businesses (Merchants) in Bandung City with E-Service Quality and IS Success approaches

Ashila Dwiyanisa[1], Irena Larashati[2], Dhea Bunga Annisa[3]
Sekolah Tinggi Ilmu Ekonomi Pasundan, Bandung[1,2,3]
Email: ashila@stiepas.ac.id[1], irena@stiepas.ac.id[2], dheabungaa2@gmail.com[3]

Abstract

Acceleration in various fields that occur today also affects the payment system that can be used by consumers. Consumers are currently presented with various cashless payment systems that are considered more convenient than previous payment methods. One of the cashless payment systems that are widely used today is QRIS or Quick Response Code Indonesian Standard. However, until now there has been no instrument that specifically measures the e-service quality provided by PJSP QRIS to its merchants. This research aims to provide alternative e-service quality with more specific indicators at PJSP QRIS for micro business merchants in Bandung City, with the E-Service Quality and IS Success approaches.

In this study, the subjects observed were micro business merchants in Bandung City who used QRIS for their payment system. Respondents were determined based on non-probability sampling with a judgmental sampling technique of 190 respondents. This research uses quantitative methods with exploratory factor analysis (EFA) approach to categorize and determine what factors make up the dimensions of electronic service quality. The research instrument used a questionnaire with 38 items that referred to the five dimensions of E-Service Quality and two dimensions of IS Success. Based on the research conducted, all the items studied formed three main factors that became measurements of QRIS e-service quality. The first is the responsiveness factor with 14 measurement items. The second is the assurance factor with five measurement items and the third factor is the reliability factor with 17 measurement items.

Keywords: *QRIS, MSME, E-Servqual, Digital Economy*

INTRODUCTION

QRIS or Quick Response Code Indonesian Standard has become one of the payment gateways in Indonesia. The Covid-19 pandemic, which is still ongoing in 2021, has a significant impact on economic conditions both globally and nationally. The pandemic is considered to provide benefits in accelerating changes in payment digitization in Indonesia. This is reflected in the increase in shopping transactions using QRIS with excellent growth of up to 300% in 2021 compared to 2020 (Indonesian Payment System Report ASPI, 2021). Bank Indonesia regulates the implementation of the national standard quick response code for payments in the Member of the Board of Governors Regulation (PADG) Number 21/18/PADG/2019 (PADG BI, 2019) and there are regulatory changes to the QRIS maximum transaction limit as outlined in PADG Number 24/1/PADG/2022 (PADG BI, 2022). The change in the maximum QRIS transaction limit was originally IDR 2 million to IDR 10 million. The purpose of changing the QRIS maximum transaction limit is to support financial inclusion, including empowerment for Micro, Small and Medium Enterprises (MSMEs) and accelerating national economic recovery. QRIS is dominated by payment transactions made at MSME merchants in Indonesia. In its development, there is a need for transactions in a nominal amount greater than the nominal limit set in the previous provisions (PADG BI, 2022).

Based on the Bank Indonesia (BI) Economic Report (BI West Java Economic Report, 2023), transactions using QRIS in West Java in the fourth quarter of 2022 continued to increase. The number of QRIS merchants in West Java reached 5.11 million merchants and has a share of 23.33% of the number of national merchants which is also the highest share in Indonesia. This shows that public acceptance and preference in West Java for the use of non-cash payments is quite high. The largest number of merchants in West Java is dominated by big cities. Based on BI Economic Report (BI West Java Economic Report, 2023), Bandung City has the largest number of merchants compared to other major cities, reaching 1.52 million merchants or 29.84% of the number of QRIS merchants in West Java. From the business scale, QRIS merchants in Bandung City are dominated by micro-scale merchants, totaling 2.87 million merchants or 56.14% of all merchants in West Java.

Referring to PADG 2019 (PADG BI, 2019), in processing QRIS transactions there are several parties involved, namely Payment System Service Providers (PJSP), switching institutions, merchant aggregators and National Merchant Repository (NMR) managers. PJSP is a bank or institution other than a bank that organizes payment system service activities. PJSPs that carry out QRIS transaction processing activities must first obtain approval from BI. Based on the official website of the Indonesian Payment System Association (ASPI) (ASPI Official Website, 2021), PJSP QRIS from the bank category, including BCA, CIMB Niaga, Danamon Indonesia, Mandiri, BNI, BTN, BRI, BSI, BJB, etc. While PJSP QRIS from the non-bank category, including ShopeePay, GoPay, DANA, Dokupay, OVO, Qren, and so on. Standard QRIS submission requirements for merchants provided by PJSP QRIS, including filling out the QRIS submission form online available on the official PJSP QRIS website or coming directly to the PJSP *QRIS* office. QRIS applications can be submitted by individual merchants or business entities, and merchants must prepare the necessary documents and requirements in accordance with the provisions and policies of PJSP QRIS.

Although the performance of transactions and the use of QRIS is considered by BI to greatly contribute to the acceleration of the economy in Indonesia, West Java and Bandung City, there has been no development of service quality measurement instruments that focus on the e-service quality provided by PJSP QRIS to its merchants. This research aims to predict and provide alternative electronic service quality measurement instruments through analyzing the factors that form the e-service quality of PJSP QRIS for micro business merchants in Bandung City, with the E-Service Quality and IS Success approaches.

The internet is one of the channels used by companies for transactions between companies and their customers, including through websites, applications, and so on. If the company's website channel is to be accepted by its customers, then the company must shift its transactions from the *e-commerce* model to *e-service*. To provide superior service quality, companies must understand how customers understand and evaluate the services provided by the company.

There are important differences in the acceptance and use of technology from customer perceptions, depending on their beliefs about the technology adapted by the company (Parasuraman, et al., 2005). In other words, there is an influence of customer attributes in measuring the ideal level of performance of the company's website, which customers want, which signifies superior e-service quality. Parasuraman, et al. (Parasuraman, et al., 2005), developed the traditional SERVQUAL measurement, to measure the quality of electronic services on online shopping websites. Along with the times, technology, changes in consumer purchasing behavior, electronic service quality measurement instruments E-S-Qual and E-RecS-Qual were developed. The results of the study stated that the evaluation of electronic service quality from the perspective of consumers of online shopping websites can be evaluated on four dimensions, namely compensation, responsiveness and fulfillment, website operation, and reliability. Zemblyte (Zemblyte, 2015) developed the W-S-Qual, E-S-Qual and E-RecS-Qual instruments into a proposed E-Service Quality measurement instrument with four dimensions, namely compensation, responsiveness and fulfillment, website operation, and reliability. In line with research (DeLone & McLean, 2003), (Petter, et al., 2008), and (Rana, et al., 2014) service quality is a variable dimension that needs to be taken into account in the success of information systems (IS Success) in organizations. In the research of Rana et al. (Rana, et al., 2014), revealed that information quality and system quality significantly affect behavioral intentions and user satisfaction. The study also proposed integrated IS Success, and showed that trust variables also shape quality variables (i.e., information quality, system quality). In addition, in the context of using government websites (e-government), website service quality can be considered as one of the strongest markers of e-government success and users' intention to continue using e-government websites. As for other research in the context of using e-wallets in Indonesia (Syifa & Tohang, 2020), e-wallet service providers need to improve ease of use, information quality, and service quality. In using technology, ease of use is important because the purpose of using technology is as a solution to make transaction activities easier. Information quality is very important because financial services are sensitive to information. In addition, service quality is also important because customers today depend on online service support. Customers need to feel safe and confident that they will get support from e-wallet service providers in case of problems, because problems related to service quality can have an impact on customer retention.

Research (Reza, 2019) states that the higher the connectivity of non-cash payment products or e-payments with stakeholders in financial institutions, the easier it is for users to make payment transactions and potentially lead to various financial innovations. From the research conducted, there are 8 (eight) factors that form the success of the e-payment system, namely: (1) connectivity, with indicators of transactions, frequency of advertisements, and login access, (2) performance, with indicators of the number of accessors, paperless, enhanced procedures, quality of advertisements, security, and

confidentiality of identity, (3) efficiency, with indicators of internet access, and efficient transactions and diversity, (4) promotion, with indicators of low cost and security of funds, (5) services, with indicators of advertising, access rights, (6) security, with indicators of access costs, faster, and confidentiality of funds, (7) benefits, with indicators of access time, next transaction bonuses and transaction bonuses, and (8) convenience, with indicators of comfort.

In line with research by Setiawan and Mahyuni (Setiawan & Mahyuni, 2020) in Denpasar City - Indonesia, there are five perceptions that shape the intention of MSME actors to use QRIS as a transaction tool in their business, namely usefulness, convenience, understanding of QRIS, the influence of outsiders (buyers, close friends, influencers/well-known figures) and barriers to using QRIS. Merchants describe QRIS as a profitable payment tool, as an alternative payment, more hygienic (because it reduces physical contact), easy to use, facilitates payment, simple form (because it only needs to scan the QR code with the camera feature on the smartphone) at the payment point. In addition, MSME actors also tend to follow trends. The convenience factor is also corroborated in Namira's research (Namira, 2022) on MSME actors in Padang City - Indonesia, that perceived ease of use affects the intention to use e-payment. MSME actors feel that using e-payment developments in payment transactions can shorten the time, energy and thoughts of business actors/users to understand and learn the e-payment technology system, because they have confidence that the technology system is easy to learn and understand. In addition, from the perception of benefits, MSME actors feel that using e-payment developments in payment transactions is able to provide benefits for them, as well as have a positive impact on improving their performance or productivity.

Zemblyte's research (Zemblyte, 2015) states that the e-service quality evaluation instrument is formed by four variables consisting of four dimensions, namely: compensation, responsiveness and fulfillment, website operation and reliability. The instrument is feasible to use in evaluating e-service quality from a customer perspective, so it can be recommended to evaluate the quality of electronic services. While in other e-service quality evaluations, namely in the context of e-government, in the research of Rana et al. (Rana, et al., 2014), there is a significant although weak relationship between information quality and perceived ease of use. This suggests that e-government system designers should pay more attention to the relevance, timeliness, and accuracy of information generated by e-government systems that meet user needs. Information quality, system quality, service quality, and perceived ease of use are significant positive determinants of user satisfaction. In addition, another finding is that system quality is a stronger predictor than perceived ease of use, and information quality. The proposed integrated model of IS Success conducted in the study can potentially be further tested in other fields to see its performance. The IS Success model is useful for understanding the key success dimensions and their interrelationships. However, researchers should take a step further and apply more specific success measurement methods to

create a comprehensive, replicable, and informative measure of IS Success (Petter, et al., 2008).

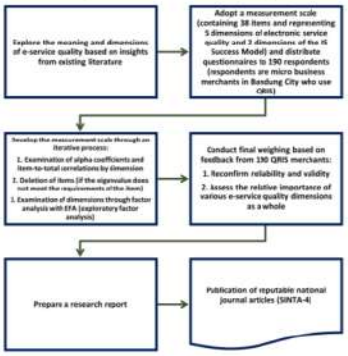
Based on the literature study conducted, the dimensions of E-S-Qual (Parasuraman, et al., 2005) are efficiency, system availability, fulfillment, and privacy, and another model E-RecS-Qual (Parasuraman, et al., 2005) responsiveness, compensation, and contact. In the development of the Zemblyte e-service quality evaluation instrument model (Zemblyte, 2015), it is an adoption of the E-S-Qual and E-RecS-Qual models (Parasuraman, et al., 2005) and W-S-Qual (Yang & Jun, 2002) and (Cai & Jun, 2003), with the addition of six dimensions relevant to website quality measurement, namely access, ease of use, website design, structure and layout, relationships, and information accuracy, because the absence of human interaction in e-services must be compensated by superior website performance. The study found that there are four dimensions of e-service quality measurement, namely compensation, responsiveness and fulfillment, website operation, and reliability.

The IS Success model has been widely used by researchers to understand and measure the dimensions of IS Success. Furthermore, each variable explaining the success of information systems is consistent with one or more of the six main success dimensions of the updated model, namely system quality (ease of use, system flexibility, etc.), information quality (relevance, understandability, accuracy, etc.), service quality (responsiveness, reliability, etc.), system usage (number of uses, frequency of use, etc.), user satisfaction (level of satisfaction with reports, website/application appearance, etc.), and net benefits (increased productivity, sales, etc.) (Petter, et al., 2008). From various models of e-service quality evaluation instruments adopted by various previous relevant studies, several indicators in e-service quality are adopted, intersecting with indicators in the IS Success model, including compensation, responsiveness and fulfillment, website operation, reliability, privacy, information quality, and system quality. Based on the literature study conducted, this research is expected to contribute to the development of a more applicable e-service quality evaluation instrument for PJSP QRIS by both banks and non-banks, namely with the e-service quality and IS Success approach with the dimensions of compensation, responsiveness and fulfillment, website operation, reliability, privacy, information quality, and system quality.

METHOD

This research was conducted using quantitative methods with an exploratory factor analysis (EFA) approach. In research (Parasuraman, et al., 2005) and (Zemblyte, 2015), the EFA approach is carried out on items, to group and determine what factors make up the dimensions of electronic service quality. Then through a series of iterations, the items forming the dimensions are grouped and redetermined from the remaining items. The stages of this research are as follows:

Figure.1 Research Stages



The questionnaire included three sections, namely section A respondent profile, section B measurement of E-Service Quality dimensions and section C measurement of IS Success dimensions. Respondents were asked to indicate their agreement based on a five-point Likert scale from (1) Strongly Disagree (STS) to (5) Strongly Agree (SS). The total questionnaire items were 38 with the following details:

1. E-Service Quality (Parasuraman, et al., 2005) and (Zemblytc, 2015) with five dimensions, namely compensation (2 indicators), responsiveness and fulfillment (6 indicators), website operation (10 indicators, reliability (7 indicators) and privacy (2 indicators).
2. IS Success (Rana, et al., 2014) with two dimensions, namely information quality (4 indicators) and system quality (7 indicators).

Data collection was conducted using a questionnaire distributed to micro business QRIS merchants in Bandung City. The sample size was determined by referring to (Heir, et al. 2019), (Phakiti, 2018) and (Taherdoost, et al. 2022) as many as 190 respondents. The sampling method is based on non-probability sampling with judgmental sampling technique. The sample is taken based on the criteria that have been formulated, namely micro business QRIS merchants with reference to the criteria applicable in Indonesia (Law on MSMEs, 2008). Furthermore, EFA (Exploratory Factor Analysis) processing and analysis were carried out with the following stages: (1) evaluate the adequacy of the sample size based on KMO and Bartlett's Test, (2) select the factor extraction method with principal axis factoring, (3) factor retention method using the scree test, (4) selection of rotation methods using oblique rotations, (5) interpretation and labeling of factors (Taherdoost, et al., 2022).

Factor analysis helps researchers to understand the interrelationship structure among variables in a data cluster by reducing and summarizing data. After that, examining the interrelationships among the many variables and then explaining them according to the similarities of the underlying dimensions, also known as factors (Sugiarto, 2017). This analysis method is also used in relevant research (Zemblyte, 2015) and (Reza, 2019). Factor analysis testing with the oblique rotation approach with oblimin rotation (Yong & Pearce, 2013) to determine the pattern matrix formed. By using the oblique rotation approach, the pattern matrix formed serves for loading factors or items and a correlation matrix (pattern matrix) of factors that can reveal any correlation between these factors. The oblique rotation approach can accurately model uncorrelated and correlated factors effectively (Osborne, 2015). After that, interpretation of the data processing results and naming of the factors

(Heir, et al., 2019), (Taherdoost, et al., 2022), (Yong & Pearce, 2013) and (Costello & Osborne, 2005).

RESULTS AND DISCUSSION

Data processing was carried out based on the results of data collection through questionnaires. The questionnaire was distributed online and offline, and 190 respondents were obtained. Respondents in this study, namely merchants or micro business actors in Bandung City. Data processing was carried out with the help of SPSS software version 25. Descriptively, the profile of respondents in this study, namely:

Table 1. Respondent Profile

Respondent Profile		Percentage (%)
A	**Business Sectors**	
1	Food	28.90
2	Finished Goods	17.37
3	Drinks	13.68
4	Services	10.00
5	Restaurant/Dining House	8.95
6	Fashion/Boutique	6.84
7	Food and Beverage	6.32
8	Transportation Equipment	2.63
9	Wickerwork/Other Crafts	2.11
10	Printing and Reproduction	1.58
11	Skin	1.05
12	Hotel/Lodging	0.53
B	**Turnover (Average Business Turnover per Month)**	
1	< IDR 5 million	10.00
2	IDR 5-10 million	40.00
3	IDR 10-25 million	38.42
4	> IDR 25 million	11.58
C	**Time (Business run)**	
1	< 5 years	28.95
2	5-10 years	36.84
3	10-15 years	15.79
4	> 15 years	18.42
D	**Availability and Use of QRIS in Business Places**	
1	< 1 year	37.89
2	1-5 years	62.11
E	**PJSP QRIS at Place of Business**	
1	Bank	17.37
2	Non Bank	33.68
3	Bank and Non-Bank	48.95

Respondent Profile		Percentage (%)
F	**Age of Business Owner**	
1	17-22 years old	2.63
2	23-28 years old	4.74
3	29-34 years old	24.74
4	35-40 years old	25.26
5	> 40 years	42.63
G	**Domicile (personal business owner)**	
1	Bandung City	51.58
2	Bandung district	14.21
3	West Bandung District	10.53
4	Cimahi City	22.11
5	DKI Jakarta	1.05
6	Serang	0.53
H	**Gender (personal business owner)**	
1	Male	60.00
2	Female	40.00
I	**Educational Background (personal business owner)**	
1	Junior high school/equivalent	3.16
2	Middle/Senior high school/equivalent	26.84
3	Package C	0.53
4	Diploma	13.16
5	S1 (Bachelor Degree)	51.05
6	S2 (Magister Degree)	5.26
190 RESPONDENTS IN TOTAL		**100**

Source: SPSS Data Processing Results (2023)

Based on the data in Table 1, the top three business sectors are food (28.95%), processed goods (17.37%) and beverages (13.68%). The highest average monthly turnover is in the range of IDR 5-10 million (40%). A total of 36.84% of businesses have been running for 5-10 years. The availability and use of QRIS as a transaction tool in their business, on average, has been implemented for 1-5 years (62.11%). A total of 48.95% of the QRIS PJSPs used by respondents are Banks and Non-Banks. In addition, demographically, the largest business owners are dominated by age > 40 years (42.63%), male gender (60%), have the latest educational background S1/Bachelor Degree (51.05%) and live in Bandung City (51.58%). This shows that the profile of respondents (represented by a large proportion of the total 190 respondents) who own micro businesses in Bandung City is as follows:

1. engaged in food;

2. generating an average monthly turnover of IDR 5-10 million;
3. have provided and used QRIS as a tool for their business transactions for an average of 5-10 years;
4. most of the QRIS PJSPs that serve are Banks and Non-Banks; and
5. Demographically, most of the business owners are male, with an average age of > 40 years, have an undergraduate education background and live in Bandung City.

Data processing was carried out using the EFA method, the following results were obtained:

Table 2. KMO and Bartlett Test Results

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,765
Bartlett's Test of Sphericity	Approx. Chi-Square	14528,254
	df	703
	Sig.	,000

Source: SPSS Data Processing Results (2023)

The KMO test illustrates whether the sample is adequate for factor analysis. While the Bartlett Test illustrates whether the factor solution is reliable. Referring to (Heir, et al., 2019), (Costello & Osborne, 2005) and (Roni & Djajadikerta, 2021), the commonly used KMO benchmark value is > 0.70 and the ideal Bartlett value is < 0.05. Based on Table 2, the KMO and Bartlett's test values and in this study are 0.765 and 0.000, meaning that this study has an adequate sample for factor analysis, falls into the good category (Roni & Djajadikerta, 2021) or the middling category (Schreiber, 2020) and the factor solution is reliable or reliable.

According to (Heir, et al., 2019), one measure of how well a variable (in other studies such as (Taherdoost, et al., 2022) and (Costello & Osborne, 2005) call it an item) is accounted for in the retained factor is communalities, which is the amount of variance of the variable/item explained by the loading factors. Research (Costello & Osborne, 2005) and other literature (Roni & Djajadikerta, 2021), suggest that in social science studies the commonly used range value is 0.40-0.70. According to research (Costello & Osborne, 2005), the recommendation for this value range needs to consider the requirement that the communalities of the recommended items have a value above 0.40. Referring to Table 3, of the 38 items that have been observed, there is only one item that has a communalities value < 0.40, 37 other items have communalities values in the range of 0.40-0.70.

Table 3. Communalities Results

Communalities		
	Initial	Extraction
COM1	,963	,602
COM2	,959	,745
RESFUL1	,935	,694
RESFUL2	,883	,647
RESFUL3	,754	,419
RESFUL4	,938	,771
RESFUL5	,917	,512
RESFUL6	,903	,639
WEB1	,987	,855

Communalities		
	Initial	Extraction
WEB2	,978	,835
WEB3	,979	,781
WEB4	,983	,743
WEB5	,991	,936
WEB6	,997	,941
WEB7	,983	,774
WEB8	,987	,803
WEB9	,961	,702
WEB10	,979	,797
RELI1	,895	,693
RELI2	,980	,846
RELI3	,996	,878
RELI4	,994	,893
RELI5	,996	,846
RELI6	,995	,876
RELI7	**,494**	**,288**
PRI1	,966	,559
PRI2	,974	,678
IQ1	,991	,883
IQ2	,993	,864
IQ3	,990	,845
IQ4	,995	,814
SYQ1	,980	,860
SYQ2	,996	,924
SYQ3	,996	,932
SYQ4	,982	,896
SYQ5	,997	,885
SYQ6	,997	,819
SYQ7	,979	,831
Extraction Method: Principal Axis Factoring.		

Source: SPSS Data Processing Results (2023)

The total variance criterion (Table 4) is an approach based on achieving a certain cumulative percentage of the total variance extracted by the successive factors. The aim is to ensure practical significance for the derived factor by ensuring that it explains at least a certain amount of variance. There is no absolute threshold adopted for all statistical software. However, in the social sciences, the information obtained varies, there are opinions stating that solutions that account for 60% of the total variance are considered satisfactory and in some other studies there are less than 60% (Heir, et al., 2019). According to (Yong & Pearce, 2013) and (Costello & Osborne, 2005) the eigenvalues test and scree plot (Figure 2) are used to determine how many factors should be retained. The standard in most statistical software is to retain all factors with eigenvalues > 1.0. Referring to Table 4, the factors that have eigenvalues > 1.0 are Factor-1 to Factor-4. Factor-1 is able to explain 64.44% of the overall research variables, Factor-2 is able to explain 7.74% of the overall variables, Factor-3 is able to explain 3.79% of the overall variables and Factor-4 is able to explain 3.69% of the overall variables. Thus, cumulatively, the four factors can explain 79.67% of the variation in the PJSP QRIS electronic service quality variable for micro business merchants in Bandung City. This percentage can be considered satisfactory according to various studies (Heir, et al., 2019). In addition, in the scree plot test, the number of data points above the break is the number of factors that must be maintained (Taherdoost, et al., 2022). In Figure 2, the number of data points

above the break is four, meaning that there are four factors that can be retained from this study.

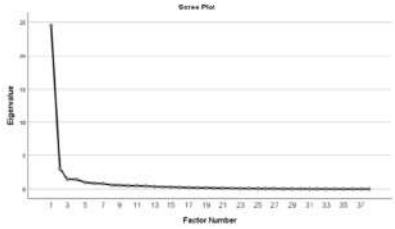
Table 4. Results of Total Variance *(Eigenvalues)*

Total Variance Explained

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings[a]
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
	24,489	64,444	64,444	24,303	63,957	63,957	22,381
	2,941	7,739	72,183	2,553	6,718	70,674	3,199
	1,443	3,796	75,979	1,244	3,273	73,948	8,695
	1,403	3,692	79,671	1,206	3,175	77,122	21,254

Source: SPSS Data Processing Results (2023)

Figure 2. *Scree Plot* Results



Source: SPSS Data Processing Results (2023)

This research uses oblique rotation, where the pattern matrix is examined to produce loading factors/loading items (Costello & Osborne, 2005). In this study, data processing has been carried out three times. In the first result, four factors were formed and there was cross-loading on two items. Furthermore, in the second result, four factors were formed and there was cross-loading on 11 items. Referring to the literature including (Heir, et al., 2019), (Taherdoost, et al, 2022), (Yong & Pearce, 2013) and (Costello & Osborne, 2005), the solution to item cross-loading can be done as long as the cross-loading of each item must be above the significance threshold (in this study the significance threshold is > 0.40 (Heir, et al., 2019), with the following steps:

1. square each loading factor and then calculate the ratio of the larger loading factor to the smaller loading factor; and
2. after calculation, the solution is determined based on the following criteria:
   1) ratios between 1.0 and 1.5 are problematic cross-loading and items with smaller loading factors are strong candidates for removal to achieve a simple structure;
   2) a ratio between 1.5 and 2.0 is potential cross-loading, with item removal based on the interpretability of the factor generated by the factor; and
   3) ratios greater than 2.0 are ignorable cross-loadings, whereas smaller loading

factors, although significant, can be omitted for interpretation purposes.

Based on these references, the following results were obtained:

Table 5. Four-Factor Pattern Matrix Results and Cross-Loading Ratios Criteria

Pattern Matrix[a]					
	Factor				Cross-loading Ratio; Criteria
	1	2	3	4	
WEB5	1,036				
WEB6	,964				
WEB1	,926				
WEB3	,906				
WEB2	,886				
WEB7	,858				
WEB9	,847				
WEB10	,819				
WEB8	,795				
RESFUL4	,737				
WEB4	,661				
RESFUL3	,650				
RESFUL2	,633		,311		4.14 (> 2.0); ignorable cross-loading
RESFUL1	,625				
COM2		,813	-,335		5.89 (> 2.0); ignorable cross-loading
COM1		,752			
RESFUL6		,735	,316		5.41 (> 2.0); ignorable cross-loading
RESFUL5		,687			
RELI7		,497			
RELI2			,539	,337	2.56 (> 2.0); ignorable cross-loading
RELI3	,388		,464		1.43 (1.0 - 1.5); problematic cross loading
SYQ2				1,048	
SYQ3				,996	
SYQ1				,940	
SYQ4				,939	
SYQ7				,849	
SYQ5				,696	
SYQ6				,658	
PRI2				,623	
IQ1			,367	,585	2.54 (> 2.0); ignorable cross-loading
IQ4				,546	
RELI6			,375	,517	1.90 (1.5 - 2.0); potential cross-loading
RELI5			,472	,499	1.12 (1.0 - 1.5); problematic cross loading
PRI1				,482	
RELI4			,461	,481	1.09 (1.0 - 1.5); problematic cross loading
IQ3			,360	,455	1.60 (1.5 - 2.0); potential cross-loading

Pattern Matrix[a]					
	Factor				Cross-loading Ratio; Criteria
	1	2	3	4	
RELI1				,437	
IQ2	,351		,350	,410	1.36 (Factor 4/1), 1.37 (Factor 4/3); both in the range (1.0 - 1.5); problematic cross loading
Extraction Method: Principal Axis Factoring. Rotation Method: Oblimin with Kaiser Normalization.					

Source: SPSS Data Processing Results (2023)

Table 6. Correlation Matrix between Four Factors

Factor Correlation Matrix				
Factor	1	2	3	4
1	1,000	,191	,466	,820
2	,191	1,000	,043	,104
3	,466	,043	1,000	,391
4	,820	,104	,391	1,000
Extraction Method: Principal Axis Factoring. Rotation Method: Oblimin with Kaiser Normalization.				

Source: SPSS Data Processing Results (2023)

Furthermore, in the third time data processing was carried out, with a slightly different procedure, namely removing two items with potential cross-loading criteria, four factors were still produced, but more cross-loading factors appeared. Referring to (Taherdoost, et al., 2022), (Yong & Pearce, 2013) and (Costello & Osborne, 2005), a factor that has less than three items, despite having a significant item loading factor value, Factor-3 (consisting of two items) is considered weak and unstable. So it is possible to remove weak items and retain strong factors. Factor correlation matrix shows the correlation between factors (Heir, et al., 2019) and (Costello & Osborne, 2005). In this study, the minimum threshold of significance is at a value of 0.40 (Heir, et al., 2019), Table 6 shows that the correlation between factors is mostly insignificant, except Factor-1 with Factor-4, which is 0.820 and Factor-1 with Factor-3, which is 0.466. This means that Factor-1 with Factor-3 and Factor-4 have significant inter-factor correlations and the highest correlation is with Factor-4, so Factor-4 is the right candidate to be retained (Taherdoost, et al., 2022), (Yong & Pearce, 2013) and (Costello & Osborne, 2005).

Based on the literature study that has been conducted, the researcher decided to return to the results of the second data processing, but decided to ignored Factor-3 and two items (RELI2 and RELI3) with the final results (Table 7) as follows:

Table 7. Final Three-Factor Pattern Matrix Results

Pattern Matrix[a]			
	Factor		
	1	2	4
WEB5	1,036		
WEB6	,964		
WEB1	,926		

Pattern Matrix[a]			
	Factor		
	1	2	4
WEB3	,906		
WEB2	,886		
WEB7	,858		
WEB9	,847		
WEB10	,819		
WEB8	,795		
RESFUL4	,737		
WEB4	,661		
RESFUL3	,650		
RESFUL2	,633		
RESFUL1	,625		
COM2		,813	
COM1		,752	
RESFUL6		,735	
RESFUL5		,687	
RELI7		,497	
SYQ2			1,048
SYQ3			,996
SYQ1			,940
SYQ4			,939
SYQ7			,849
SYQ5			,696
SYQ6			,658
PRI2			,623
IQ1			,585
IQ4			,546
RELI6			,517
RELI5			,499
PRI1			,482
RELI4			,481
IQ3			,455
RELI1			,437

Pattern Matrix[a]			
	Factor		
	1	2	4
IQ2			,410

Extraction Method: Principal Axis Factoring. Rotation Method: Oblimin with Kaiser Normalization.

Source: SPSS Data Processing Results (2023)

Based on the results of the second data processing and literature studies that have been conducted in this study, three factors are produced, namely Factor-1 consists of 14 items, Factor-2 consists of five items and Factor-4 consists of 17 items (Table 8). After data interpretation, the next procedure is to name the factors (Heir, et al., 2019), (Taherdoost, et al., 2022), (Yong & Pearce, 2013) and (Costello & Osborne, 2005). Referring to the pattern matrix Table 7, in this study the following factors were obtained:

Table 8. Factors Forming the Quality of Electronic Services of Payment System Service Providers (PJSP) QRIS at Micro Businesses (Merchants) in Bandung City

Item	Factor Naming and Item Description	Loading Factors
Factor-1 "Responsiveness"		
WEB5	PJSP QRIS website/application provides useful and reliable information	1,036

Item	Factor Naming and Item Description	Loading Factors
WEB6	PJSP QRIS website/application makes it easy to find what I need	,964
WEB1	Information on PJSP QRIS website/application is well organized, accurate and up-to-date	,926
WEB3	PJSP QRIS website/application loads its pages quickly and easily	,906
WEB2	PJSP QRIS website/application available 24/7 for business activities	,886
WEB7	There is a good search system in the PJSP website/application (search menu, FAQ, etc.)	,858
WEB9	PJSP QRIS website/application is easy to use	,847
WEB10	PJSP QRIS website/application is well organized and easily accessible	,819
WEB8	PJSP QRIS website/application provides information on service pricing, description, instructions etc.	,795
RESFUL4	PJSP QRIS is honest about its offerings	,737
WEB4	PJSP QRIS website/application enables fast transaction completion	,661
RESFUL3	QRIS PJSPs provide various options for payment (e.g. Merchant Discount Rate/MDR), delivery and/or return of products	,650
RESFUL2	PJSP QRIS responds quickly when calling the call center or writing an e-mail	,633
RESFUL1	QRIS PJSPs create accurate services (accurate consumer transaction records, accurate accounts, etc.)	,625
Factor-2 "Assurance"		

Item	Factor Naming and Item Description	Loading Factors
COM2	PJSP QRIS compensates for the problems it creates	,813
COM1	PJSP QRIS compensates when what is ordered/submitted does not materialize on time	,752
RESFUL6	QRIS PJSPs offer clear product return/service recovery policies and warranties	,735
RESFUL5	QRIS PJSP handles problems quickly	,687
RELI7	QRIS PJSP's ability to solve problems and to answer questions	,497
Factor-4 "Reliability"		
SYQ2	Merchants find the PJSP QRIS system easy to use	1,048
SYQ3	PJSP QRIS system provides reliable services	,996
SYQ1	QRIS PJSP system is merchant-friendly	,940
SYQ4	PJSP QRIS system provides fast service for merchants	,939
SYQ7	The PJSP QRIS system is designed to meet the needs of merchants	,849
SYQ5	PJSP QRIS system is responsive to merchant requests	,696
SYQ6	The PJSP QRIS system is designed with the best interests of merchants in mind	,658
PRI2	PJSP QRIS website/application protects information about merchant account and transaction data	,623
IQ1	The PJSP QRIS system provides sufficient information	,585
IQ4	Information provided by the PJSP QRIS system is reliable	,546
RELI6	Merchant orders/submissions are quickly confirmed and stored by PJSP QRIS	,517

Item	Factor Naming and Item Description	Loading Factors
RELI5	In the event of a problem, it is possible to speak to a concrete employee of the PJSP QRIS (contact details are provided on the PJSP QRIS website/app).	,499
PRI1	PJSP *QRIS* does not share *merchants'* personal information with other websites	,482
RELI4	Ability of PJSP *QRIS* to deliver promised services prudently and consistently/stably	,481
IQ3	Information provided by the current PJSP *QRIS* system	,455
RELI1	Good reputation and image of PJSP *QRIS*	,437
IQ2	Through the PJSP *QRIS* system, *merchants* get the information they need on time	,410

CONCLUSION

Service quality is one of the important aspects in marketing that needs to be measured to determine the effectiveness in achieving customer satisfaction, including one of them in the QRIS-based payment system which is currently one of the main payment alternatives used by consumers. Based on the results of the research conducted, the factors forming the service quality of the QRIS payment system consist of three factors, namely responsiveness, assurance and reliability. The responsiveness factor contains items that measure the ability of QRIS to respond quickly and fulfill customer needs, such as providing useful information, convenience, organized information, website/application speed of loading pages, availability, good search system, easy to use website/application, easy to access website/application, website/application that provides complete information, honesty in offers, fast transaction completion, variety of payment options, quick response to complaints and making accurate services. While the assurance factor contains items such as compensation for problems or delays in problem solving, returns, the ability to handle problems quickly, as well as solve problems and answer questions. And in the reliability factor, items are measured such as an easy-to-use system, service reliability, friendliness, fast service, meeting needs, responsiveness to requests, prioritizing consumer interests, security of consumer data information, providing sufficient information, information reliability, speed of the order system, access to services, no consumer information is disseminated, service consistency, up-to-date

information, good reputation, timely information.

With these alternative measurements, it is hoped that the measurement of service quality in QRIS can be done more specifically according to its character. This research still needs development such as in the confirmation process on the consistency of the grouping of items in the factors. In addition, alternative measurements on other cashless payment systems also need to be carried out to get an overall picture of the payment system used by consumers today.

ACKNOWLEDGEMENT

This research was funded by : KEMDIKBUDRISTEK, grant number : 0536/E5/PG.02.00/2023.

REFERENCES

Cai, S., & Jun, M. (2003). Internet users' perceptions of online service quality: a comparison of online buyers and information searchers. *Managing Service Quality: An International Journal*, *13*(6), 504–519. https://doi.org/10.1108/09604520310506568

Costello, A. B., & Osborne, J. (2005). Best Practices in Exploratory Factor Analysis: Four Recommendations for Getting the Most From Your Analysis. *Practical Assessment, Research, and Evaluation*, *10*(7). https://doi.org/https://doi.org/10.7275/jyj1-4868

Hair, J. F., Babin, B. J., Anderson, R. E., & Black, W. C. (2019). *Multivariate Data Analysis* (p. 832). Cengage Learning.

Peraturan Anggota Dewan Gubernur Nomor 21/18/PADG/2019, (2019). https://www.bi.go.id/id/publikasi/peraturan/Documents/padg_211819.pdf

Peraturan Anggota Dewan Gubernur Nomor 24/1/PADG/2022, (2022). https://www.bi.go.id/id/publikasi/peraturan/Documents/PADG_240122.pdf

Indonesia, B. (2023). *Laporan Perekonomian Provinsi Jawa Barat*. Bank Indonesia. https://www.bi.go.id/id/publikasi/laporan/lpp/Documents/Laporan%20Perekonomian%20Provinsi%20Jawa%20Barat%20Februari%202023.pdf

Namira, L. (2022). Faktor-Faktor Yang Mempengaruhi Niat UMKM di Kota Padang Menggunakan e-Payment sebagai Metode Pembayaran. *Owner*, *6*(1), 212–224. https://doi.org/10.33395/owner.v6i1.553

Osborne, J. W. (2015). *What is Rotating in Exploratory Factor Analysis?* ScholarWorks@UMass Amherst. https://scholarworks.umass.edu/pare/vol20/iss1/2/

Parasuraman, A., Zeithaml, V. A., & Malhotra, A. (2005). E-S-QUAL. *Journal of Service Research*, *7*(3), 213–233. https://doi.org/10.1177/1094670504271156

Petter, S., DeLone, W., & McLean, E. (2008). Measuring information systems success: models, dimensions, measures, and interrelationships. *European Journal of Information Systems*, *17*(3), 236–263. https://doi.org/10.1057/ejis.2008.15

Phakiti, A. (2018). Exploratory Factor Analysis. In *The Palgrave Handbook of Applied Linguistics Research Methodology* (pp. 423–457). Palgrave Macmillan UK. http://dx.doi.org/10.1057/978-1-137-59900-1_20

Undang-undang (UU) tentang Usaha Mikro, Kecil, dan Menengah, (July 4, 2008). https://peraturan.bpk.go.id/Home/Details/39653/uu-no-20-tahun-2008

Rana, N. P., Dwivedi, Y. K., Williams, M. D., & Weerakkody, V. (2014). Investigating success of an e-government initiative: Validation of an integrated IS success model. *Information Systems Frontiers*, *17*(1), 127–142. https://doi.org/10.1007/s10796-014-9504-7

Reza, Y. (2019). Analisis Faktor-faktor Sukses Sistem E-Payment . *Jurnal Riset Sains Manajemen*, *3*(1), 31–48.

Roni, S. M., & Djajadikerta, H. G. (2021). *Data Analysis with SPSS for Survey-based Research*. Springer Nature.

Schreiber, J. B. (2021). Issues and recommendations for exploratory factor analysis and principal component analysis. *Research in Social and Administrative Pharmacy*, *17*(5), 1004–1011. https://doi.org/10.1016/j.sapharm.2020.07.027

Setiawan, I. W. A., & Mahyuni, L. P. (2020). QRIS DI MATA UMKM: EKSPLORASI PERSEPSI DAN INTENSI UMKM MENGGUNAKAN QRIS. *E-Jurnal Ekonomi Dan Bisnis Universitas Udayana*, 921–946. https://doi.org/10.24843/eeb.2020.v09.i10.p01

Sistem Pembayaran Indonesia, A. (2021a). *Laporan Tahunan 2021*. https://www.aspi-indonesia.or.id/berita-info/laporan-tahunan/

Sistem Pembayaran Indonesia, A. (2021b). *QRIS*. ASPI Indonesia. https://www.aspi-indonesia.or.id/standar-dan-layanan/qris/

Sugiarto. (2017). *Metodologi Penelitian Bisnis* (1st ed.). Penerbit ANDI.

Syifa, N., & Tohang, V. (2020, August). *The Use Of E-Wallet System*. 2020 International Conference on Information Management and Technology (ICIMTech). http://dx.doi.org/10.1109/icimtech50083.2020.9211213

Taherdoost, H., Sahibuddin, S., & Jalaliyoon, N. (2022). Exploratory Factor Analysis; Concepts and Theory. *SSRN*, *1*(27), 375–382.

The DeLone and McLean Model of Information Systems Success: A Ten-Year Update. (2003). *Journal of Management Information Systems*, *19*(4), 9–30. https://doi.org/10.1080/07421222.2003.11045748

Yang, Z., & Jun, M. (2002). Consumer Perception of E-Service Quality: From Internet Purchaser and Non-Purchaser Perspectives. *Journal of Business Strategies*, *25*(2), 59–84. https://doi.org/10.54155/jbs.25.2.59-84

Yong, A. G., & Pearce, S. (2013). A Beginner's Guide to Factor Analysis: Focusing on Exploratory Factor Analysis. *Tutorials in Quantitative Methods for Psychology*,

9(2), 79–94. https://doi.org/10.20982/tqmp.09.2.p079

Zemblytė, J. (2015). The Instrument for Evaluating E-Service Quality. *Procedia - Social and Behavioral Sciences*, *213*, 801–806. https://doi.org/10.1016/j.sbspro.2015.11.478

4.228-JCB

ORIGINALITY REPORT

15%
SIMILARITY INDEX

PRIMARY SOURCES

1	jurnal.stmik-mi.ac.id Internet	149 words — 2%
2	Zemblytė, Jurgita. "The Instrument for Evaluating E-Service Quality", Procedia - Social and Behavioral Sciences, 2015. Crossref	118 words — 2%
3	link.springer.com Internet	102 words — 1%
4	www.tandfonline.com Internet	86 words — 1%
5	Nabilla Syifa, Valentina Tohang. "The Use Of E-Wallet System", 2020 International Conference on Information Management and Technology (ICIMTech), 2020 Crossref	41 words — 1%
6	www.researchgate.net Internet	35 words — 1%
7	citeseerx.ist.psu.edu Internet	24 words — < 1%
8	salford-repository.worktribe.com Internet	24 words — < 1%

9	pdffox.com Internet	23 words — < 1%
10	journal.formosapublisher.org Internet	20 words — < 1%
11	adpebipublishing.com Internet	17 words — < 1%
12	www.ncbi.nlm.nih.gov Internet	17 words — < 1%
13	jurnal.stiepas.ac.id Internet	16 words — < 1%
14	mebis.upnjatim.ac.id Internet	16 words — < 1%
15	www.docstoc.com Internet	16 words — < 1%
16	e-journal.undikma.ac.id Internet	14 words — < 1%
17	www.cambridgenigeriapub.com Internet	14 words — < 1%
18	www.tailieudaihoc.com Internet	14 words — < 1%
19	hdl.handle.net Internet	13 words — < 1%
20	jppipa.unram.ac.id Internet	13 words — < 1%
	www.dlib.si	

21	Internet	13 words — < 1%
22	"From Industry 4.0 to Industry 5.0", Springer Science and Business Media LLC, 2023 Crossref	12 words — < 1%
23	Gjoko Stamenkov, Zamir Dika. "Bank employees' internal and external perspectives on e-service quality, satisfaction and loyalty", Electronic Markets, 2016 Crossref	12 words — < 1%
24	orca.cardiff.ac.uk Internet	11 words — < 1%
25	centerforpbbefr.rutgers.edu Internet	10 words — < 1%
26	islamicmarkets.com Internet	10 words — < 1%
27	jurnal.unsil.ac.id Internet	10 words — < 1%
28	Alexis Harerimana, Ntombifikile Gloria Mtshali. "Using Exploratory and Confirmatory Factor Analysis to understand the role of technology in nursing education", Nurse Education Today, 2020 Crossref	9 words — < 1%
29	Ali Gunawan, Alifia Farrah Fatikasari, Selva Aisah Putri. "The Effect of Using Cashless (QRIS) on Daily Payment Transactions Using the Technology Acceptance Model", Procedia Computer Science, 2023 Crossref	9 words — < 1%
30	Industrial Management & Data Systems, Volume 112, Issue 6 (2012-06-30)	9 words — < 1%

Publications

31	Journal of Research in Interactive Marketing, Volume 4, Issue 3 (2010-08-21) Publications	9 words — < 1%
32	Jusuf Zeqiri, Todor Raluca Dania, Lupșa-Tătaru Dana Adriana, Kumrije Gagica, Kimberly Gleason. "The impact of e-service quality on word of mouth: A higher education context", The International Journal of Management Education, 2023 Crossref	9 words — < 1%
33	jurnal.machung.ac.id Internet	9 words — < 1%
34	Ahmed Alshehri, Malcolm J Rutter, Sally Smith. "The Effects of UTAUT and Usability Qualities on Students' Use of Learning Management Systems in Saudi Tertiary Education", Journal of Information Technology Education: Research, 2020 Crossref	8 words — < 1%
35	Ann Pearson, Suresh Tadisina, Chris Griffin. "The Role of E-Service Quality and Information Quality in Creating Perceived Value: Antecedents to Web Site Loyalty", Information Systems Management, 2012 Crossref	8 words — < 1%
36	Gayathri Ranjit, Suresh Subramoniam, Binoosh S. A.. "Prioritizing E-service Quality Dimensions in E-tailing: Application of the Analytic Hierarchy Process", Global Business Review, 2023 Crossref	8 words — < 1%
37	Journal of Service Management, Volume 20, Issue 5 (2009-10-02) Publications	8 words — < 1%

38	N. Wachyudhi, MM Budi Haryanto. "E-BANKING AND CONSUMER BEHAVIOR: THE ROLE OF SWITCHING COSTS", Corporate Ownership and Control, 2016 Crossref	8 words — < 1%
39	Princely Ifinedo. "Internal IT Knowledge and Expertise as Antecedents of ERP System Effectiveness: An Empirical Investigation", Journal of Organizational Computing and Electronic Commerce, 2011 Crossref	8 words — < 1%
40	iejee.com Internet	8 words — < 1%
41	ijrp.org Internet	8 words — < 1%
42	iloskillskspstorage.blob.core.windows.net Internet	8 words — < 1%
43	journal.diginus.id Internet	8 words — < 1%
44	journal.feb.unmul.ac.id Internet	8 words — < 1%
45	nova.newcastle.edu.au Internet	8 words — < 1%
46	repozitorij.unizg.hr Internet	8 words — < 1%
47	www.assumptionjournal.au.edu Internet	8 words — < 1%
48	www.proakademia.eu Internet	8 words — < 1%

49 Journal of Service Management, Volume 23, Issue 2 (2012-04-21) — 7 words — < 1%
Publications

50 Managing Service Quality, Volume 23, Issue 1 (2013-01-29) — 7 words — < 1%
Publications

51 Nripendra P. Rana, Yogesh K. Dwivedi, Michael D. Williams, Vishanth Weerakkody. "Investigating success of an e-government initiative: Validation of an integrated IS success model", Information Systems Frontiers, 2014 — 7 words — < 1%
Crossref

52 Delfín Ortega-Sánchez, Isabel Gómez-Trigueros. "Massive Open Online Courses in the Initial Training of Social Science Teachers: Experiences, Methodological Conceptions, and Technological Use for Sustainable Development", Sustainability, 2019 — 6 words — < 1%
Crossref

53 Djilali Idoughi, Djeddi Abdelhakim. "Developing Countries E-Government Services Evaluation Identifying and Testing Antecedents of Satisfaction Case of Algeria", International Journal of Electronic Government Research, 2018 — 6 words — < 1%
Crossref

54 Frederic Marimon, Luc Honore Petnji Yaya, Marti Casadesus Fa. "Impact of e-Quality and service recovery on loyalty: A study of e-banking in Spain", Total Quality Management & Business Excellence, 2012 — 6 words — < 1%
Crossref

EXCLUDE QUOTES	ON	EXCLUDE SOURCES	OFF
EXCLUDE BIBLIOGRAPHY	ON	EXCLUDE MATCHES	OFF