Electronic Service Quality and Perceived Value in Mobile based Services

Doddy Ridwandono, Tri Lathif Mardi Suryanto and Gita Islamiwaty Suherlan
Department of Information Systems, Universitas Pembangunan Nasional "Veteran" Jawa Timur, Surabaya, Indonesia

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Abstract: Indonesia is one of the countries with the highest number of mobile user growth in the world. To support its services, telecommunications companies provide mobile-based services. This paper aims to determine the service quality attributes of mobile services, and reveal their relationship with another variable, Perceived Value. The survey was conducted electronically on users of the mobile services application (My-Telkomsel) in Surabaya, Indonesia. 523 and 115 respondents were collected for E-S-Qual and E-Recs-Qual scale, respectively. The collected data was further tested using SmartPLS software. The result was: E-S-Qual which consists of Efficiency, System Availability, Fulfilment, and Privacy has a significant effect on Perceived Value. As for the E-RecS-Qual, only the Responsiveness variable has a significant effect on Perceived Value. Two other variables, Compensation and Contact, have no significant effect. This research could encourage service providers to put emphasize on certain quality attributes. In addition, this study provides insight regarding the effect of service quality on Perceived Value.

1 INTRODUCTION

There is a need to assess service quality (Batagan 2013). The growth of various types of services encourages the creation of new ways of delivering services and increases the interest of researchers to study the field (Furrer et al. 2020). One of them is a study in the change in customer preferences (Patten et al. 2020) due to device adoption in both the desktop and mobile contexts (Kaatz 2020). This paper focuses on one particular aspect, Service Quality in the mobile services context.

The level of urgency to conduct research on service quality in a mobile context is high. According to statista.com and datareportal.com, it is close to 60% of the world's total population use the internet. Around 91% of internet users use mobile devices in which Indonesia is ranked 4th in the number of the internet user (Pengguna and Indonesia 2020). The increase in internet users has encouraged many companies to develop mobile-based services, and therefore the quality of their services needs to be measured (Tharanikaran et al. 2017), (Rita et al. 2019), (Furrer et al. 2020). These facts were the motivation to identify the mobile-based services quality dimension in Indonesia.

The object of this research is an Indonesian telecommunications company mobile-based service, MyTelkomsel (my.telkomsel.com). The application is intended to provide convenience for customers in managing accounts and accessing services using a smartphone. Services that can be fulfilled include purchasing data packages, as well as providing information needed by a customer. This object was chosen considering its large number of users and transactions (Kusdinar and Ariyanti 2020). While the model chosen to identify the variables of service quality is ServQual (Parasuraman et al. 2005)

(Parasuraman et al. 2005) is one of the studies that many referenced regarding Service Quality. Many researchers use this research as the basis for model development. As an example, (Tharanikaran et al. 2017), (Mujinga 2020), examined the effect of service quality on customer satisfaction in the context of e-banking and online shoping (Rita et al. 2019). There are also researchers who adopt question items from (Parasuraman et al. 2005) for hotel services domain (Le et al. 2020). Moreover, Service quality could not only predict customer satisfaction, but also predict the impact on relationship quality (Rahahleh et al. 2020) and perceived value (Mendoza et al. 2020), (Li and

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Shang 2020), (ÇETİNSÖZ 2015), (Akter et al. 2013).

(Parasuraman et al. 2005), suggested that the model should be tested in the context of pure service. (Akinci et al. 2010) argued that E-S-QUAL and E-RecS-QUAL (Component of ServQual) are scales that can be used to measure service quality in the context of internet banking. Their research was later adopted by (Tharanikaran et al. 2017), which was also done on the pure service object. Based on the background, the purpose of this paper is to answer whether the ServQual dimension can be used to measure the quality of mobile-based services (MyTelkomsel). The second, is Perceived Value influenced by electronic service quality.

2 PREVIOUS RE SEARCH

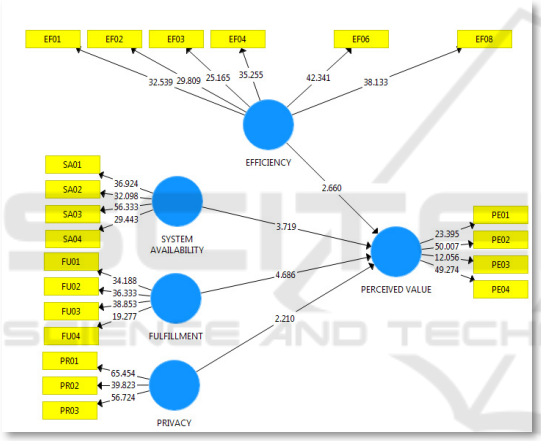

Figure 1: E-S-Qual Conceptual Model/Result

Service quality or SERVQUAL designed to measure the gap between expectations and customer perceptions (Parasuraman et al. 1988). (Parasuraman et al. 2005) argued, that there are seven dimensions of electronic service quality: efficiency system availability, fulfilment, privacy (grouped into ES-QUAL - all stages of customer interaction with service); Responsiveness, Compensation, and Contact (grouped into E-RecS-QUAL - to measure the level of recovery in the event of a service failure). (Akinci et al. 2010) and (Tharanikaran et al. 2017) applied the scale in a non-retail context while (Parasuraman et al. 2005) applied the model on online retail companies (i.e., Amazon and Walmart).

This paper adopts the scale for online financial services, such as internet banking which has less tangible elements which was developed by (Tharanikaran et al. 2017). It was hoped that the scale is appropriate for the characteristics of the object chosen (myTelkomsel). To test the nomological validity of ServQual, this paper also adopts the variable which were used in (Parasuraman et al. 2005), Perceived Value. Perceived Value is defined as an evaluation of the total benefits of a product/services by the customer (ÇETİNSÖZ 2015). Details regarding the measurement technique are presented in the methodology section.

3 METHODOLOGY

The approach used to validate the E-Service Quality variable on the My Telkomsel application service refers to (Akinci et al. 2010). The ServQual dimension was grouped into E-S-Qual and E-Recs-Qual variables. E-S-Qual variables consist of: Efficiency, System Availability, Fulfilment, and Privacy. While E-Recs-Qual variables consist of: Responsiveness, Compensation, Contact.

For the E-S-Qual scale, all collected respondents were used. Meanwhile, for the E-Recs-Qual scale, only uses a number of respondents who has a specific condition (i.e. who have experienced problems and were seeking for help from service provider to solve these problems). The conceptual model of this research can be seen in Figure 1 and Figure 2. Figure 1 is the conceptual model of E-S-Qual while Figure 2 is the conceptual model of E-Recs-Qual. Due to limited space, the conceptual model shown was also the output / test result of the SmartPLS tools.

Based on (Akinci et al. 2010) and (Parasuraman et al. 2005) the ServQual scale was grouped into 2 (i.e. E-S-Qual Scale and E-Recs-Qual). Since this study also intends to conduct a Nomological test using the Perceived Value variable, the hypothesis of this study is:

E-S-Qual Scale

H1: Efficiency is considered to have an influence on Perceived Value

H2: System Availability is considered to have an influence on Perceived Value

H3: Fulfilment is considered to have an influence on Perceived Value

H4: Privacy is considered to have an influence on Perceived Value

E-Recs-Qual scale:

H5: Responsiveness is considered to have an influence on Perceived Value

H6: Compensation is considered to have an influence on Perceived Value

H7: Contact is considered to have an influence on perceived value.

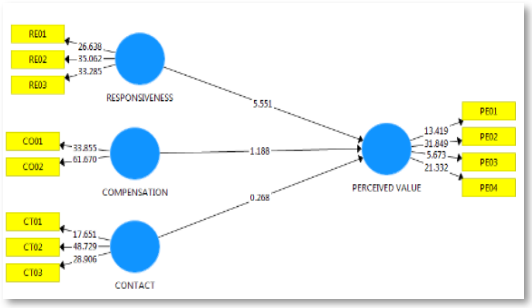

Figure 2. E-Recs-Qual Conceptual Model/Result

4 RESULTS

4.1 Respondent

Total respondent in this study were 523 people, the sample profile can be seen in table 1.

Table 1: Sample Profile

Age	<25	429
	25 – 40	32
	41-55	10
	>55	2
Sex	Male	204
	Female	319
Occupation	Student	71%
	Employee	16%
	etc	13%

For the E-S-Qual Scale, all of the respondents, 523 people, were used. While for the E-Recs-Qual scale, the respondents were 115 people (i.e. who have experienced problems and were seeking for help to solve these problems).

4.2 E-S-Qual Loading Factor, AVE, Discriminant Validity.

Section 4.2 describes the results of the validity and reliability tests of E-S-Qual variables (i.e. Efficiency, Fulfilment, Privacy, System Availability).

Table 2: E-S-Qual Loading Factor

Item	Loading Factor
Efficiency EF01	0.773
Efficiency EF02	0.767
Efficiency EF03	0.732
Efficiency EF04	0.777
Efficiency EF06	0.812
Efficiency EF08	0.805
Fulfilment FU01	0.805
Fulfilment FU02	0.816
Fulfilment FU03	0.806
Fulfilment FU04	0.728
PerceivedValue PE01	0.733
PerceivedValue PE02	0.834
PerceivedValue PE03	0.623
PerceivedValue PE04	0.847
Privacy PR01	0.884
Privacy PR02	0.874
Privacy PR03	0.869
SystemAvailabilitySA01	0.806
SystemAvailabilitySA02	0.762
SystemAvailabilitySA03	0.852
SystemAvailabilitySA04	0.757

All question items were adopted from (Tharanikaran et al. 2017). Based on the validity test, items EF05 and EF05 were dropped, then the data was retested. As can be seen in Table 2, all items from the Efficiency, Fulfilment, Privacy, System Availability variables have a value above 0.707, therefore they were considered valid.

Table 3: E-S-Qual AVE

	Average Variance Extracted (AVE)
EFFICIENCY	0.606
FULFILLMENT	0.623
PERCEIVED VALUE	0.584
PRIVACY	0.767
SYSTEM AVAILABILITY	0.632

Table 3 shows the AVE value of each variable. It can be seen that all AVE values are above 0.5, thus this result supports the validity.

Table 4: E-S-Qual Discriminant Validity

	EF	FU	PE	PR	SA
EF	**0.778**				
FU	0.655	**0.789**			
PE	0.544	0.561	**0.764**		
PR	0.458	0.51	0.419	**0.876**	
SA	0.762	0.644	0.56	0.508	**0.795**

Table 4 shows the value of discriminant validity. The value of the discriminant validity for each variable must be above 0.70 and there is no discriminant validity value from other variables which were larger. Referring to table 4, all of the data have met these criteria.

Table 5: E-S-Reliability Test Value

	Cronbach's Alpha	Composite Reliability
Efficiency	0.870	0.902
Fulfilment	0.798	0.868
Perceived Value	0.765	0.847
Privacy	0.849	0.908
System Availibility	0.806	0.873

Table 5 shows the results of the reliability test. Almost all values were above 0.8, except for Fulfilment. This shows that the level of reliability is considerably good.

4.3 E-Recs-Qual Loading Factor

Section 4.3 specifically addresses E-Req-Qual. The variables tested were: Compensation, Contact and Responsiveness. As is the case with E-S-Qual, what will be tested is the validity and reliability of the variables.

Table 6: E-Recs-Qual Loading Factor

Item	Loading Factor
Compensation CO01	0.925
Compensation CO02	0.955
Contact CT01	0.819
Contact CT02	0.921
Contact CT03	0.886
Perceived Value PE01	0.79
Perceived Value PE02	0.859
Perceived Value PE03	0.65
Perceived Value PE04	0.841
Responsiveness RE01	0.87
Responsiveness RE02	0.875
Responsiveness RE03	0.901

Based on table 6, it can be seen that all values were above 0.707, it can be concluded that all question items were valid.

Table 7: E-Recs-Qual AVE

	Average Variance Extracted (AVE)
EFFICIENCY	0.884
FULFILLMENT	0.778
PERCEIVED VALUE	0.768
PRIVACY	0.623
SYSTEM AVAILABILITY	0.632

The results of calculating the AVE value are shown in table 7. In which, all values were above 0.5 so that it can be concluded, that all variables are valid.

Table 8: E-Recs-Qual Discriminant Validity

	CO	CT	PE	RE
CO	**0.94**			
CT	0.334	**0.877**		
PE	0.432	0.36	**0.789**	
RE	0.569	0.602	0.631	**0.882**

(Note: Co: Compensation, CT: Contact, PE: Perceived Value, RE: Responsiveness)

Table 8 shows the value of discriminant validity. The value of the discriminant validity for each variable must be above 0.70, and there is no discriminant validity value from other variables that were larger. Referring to table 8, all data have met these criteria.

Table 9: E-Recs-Qual Reliability Test Value

	Cronbach's Alpha	Composite Reliability
Compensation	0.87	0.938
Responsiveness	0.858	0.913
Contact	0.85	0.908
Perceived Value	0.795	0.867

Table 9 shows the results of the reliability test. All values (Compensation, Responsiveness and Contact) were above 0.8. This shows that the level of reliability is good. After testing the validity and reliability, the next step is to examine the inner model.

4.4 Inner Model

The results of the calculation in the form of image / conceptual models can be seen in Figure 1 and Figure 2. In the inner model, there are at least two important things that need to be considered, the R^2 value and hypothesis testing.

Table 10: E-S-Qual R^2

	R Square	R Square Adjusted
Perceived Value	0.399	0.395

Based on table 10, E-S-Qual (Efficiency, Fulfilment, Privacy, System Availability) can account for about 40% of the Perceived Value. Thus these results show moderate results, since there are still 60% of other variables that can explain Perceived Value.

Table 11: E-Recs-Qual R^2

	R Square	R Square Adjusted
Perceived Value	0.407	0.391

Similar results were also given by E-Recs-Qual, E-Recs-Qual can explain about 40% of Perceived Value. The results can be referred to in table 11

Table 12: E-S-Qual Hypothesis Test

	P Values
Efficiency → Perceived Value	0.008
Fulfilment → Perceived Value	0.000
Privacy → Perceived Value	0.0028
System Availability → Perceived Value	0.000

With regard to hypothesis testing, all variables E-S-Qual (Efficiency, Fulfilment, Privacy, System Availability) influencing the perceived value. See table 12. Different results were shown in Table 13, that there was only one variable, namely Responsiveness which affects the perceived value.

Table 13. E-Recs-Qual Hypothesis Test

	P Values
Compensation → Perceived Value	0.235
Contact → Perceived Value	0.789
Responsiveness → Perceived Value	0.000

5 DISCUSSIONS

This paper contributes to the research conducted by (Parasuraman et al. 2005), especially with regard to E-Recs-Qual. Although there was a challenge to get respondents for the E-Recs-Qual variable. The proportion of qualified users to qualify as E-Recs-Qual respondents (Individual who have experienced problems and were seeking for help to solve these problems) is approximately 1 in 5. Therefore, to obtain a sufficient number of respondents requires distributing a lot of questionnaires.

All of Parasuraman's E-S-Qual constructs (efficiency, system availability, fulfillment and privacy) meet the psychometric levels / values. However there were two question items that must be dropped: EF5 and EF5. Regarding the E-Recs-Qual, all existing constructs / variables are valid and reliable. These findings can help managers to allocate existing resources to improve aspects related to Electronic Service Quality.

The test results also show that the dimensions of the E-S-Qual (efficiency, system availability, fulfillment and privacy correlates with Perceived Value). Whereas, for E-Recs-Qual dimensions, only the responsiveness dimension was correlated with Perceived Value. The dimensions of contact and compensation do not correlate with perceived value. Discussion regarding the findings will be presented in the following sub section.

5.1 Efficiency–Perceived Value Correlation

Efficiency relates to interface design, which allows customers to easily find what they need. Efficiency is one of the four variables from the E-S-Qual scale that has the strongest influence on Perceived Value. (Parasuraman et al. 2005) argued that the companies need to give emphasis to this variable. The same result is also shown in (Akinci et al. 2010) that the Efficiency and Fulfillment variables show a stronger direct effect on Perceived Value.

5.2 System Availability–Perceived Value Correlation

The finding that Availability has a positive effect on should encourage organizations to pay more attention to these factors. Since there is a close relationship between service quality and customer satisfaction (Ma 2012), (Chavosh et al. 2011), (Ma and Zhao 2012).

5.3 Fulfilment–Perceived Value Correlation

Apart from Efficiency, Fulfillment is the second of the 4 variables from the E-S-Qual scale that has the strongest influence on Perceived Value. The findings on the correlation between Fulfilment and Perceived

Value are the same as the research results in (Akinci et al. 2010) and (Parasuraman et al. 2005).

5.4 Privacy–Perceived Value Correlation

Referring to (Parasuraman et al. 2005), previous research has argued that Web site privacy may not be important for more frequent users (Wolfinbarger and Gilly 2003). However, this study has the same results as the research conducted by (Parasuraman et al. 2005), that the perception of privacy does affect Perceived Value. This result also confirms the need for companies to increase customer data security and assure customers that the company can guarantee the confidentiality of their data.

5.5 E-Recs-Qual Dimensions-Perceived Value Correlation

The discussion regarding the test results related to the E-S-Qual dimensions (efficiency, system availability, fulfilment, privacy) have already been discussed in subsections 5.1 to 5.4. Section 5.5 describes the test results regarding the dimensions of the E-Recs-Qual (i.e. responsiveness, contact, compensation).

This study examined the E-Recs-Qual, by following the dimensions described in the (Parasuraman et al. 2005). In his research, Parasuraman was unable to test these variables since the number of respondents was inadequate. In this study, the number of respondents for the E-Recs-Qual scale was 115 people. In other word, only 115 people out of 523 total respondents had experienced problems when using the application and reported the incident.

The responsiveness dimension shows a positive correlation on perceived value. Thus it shows that the higher the responsiveness value, the positive impact it will have on perceived value. However, for two other dimensions, contact and compensation, have no correlation with perceived value. (Akinci et al. 2010) suggested, that mobile-based service users do not prefer to use the telephone / face-to-face assistance channel when they face a problem. With regard to compensation, there is no evidence that it is correlated with Perceived Value. Based on this, with regard to customer complaints, mobile-based service providers must prioritize one main thing, Responsiveness.

6 CONCLUSIONS

1. The test results, based on questionnaire data from 523 respondents for E-S-Qual, and 115 respondents for E-Req-Qual show: Almost all question, except EF05 and EF07, which were adopted from (Tharanikaran et al. 2017) are valid and reliable. These items of questions can be used to measure the quality of mobile-based services.
2. All variables from E-S-Qual (Efficiency, Fulfilment, Privacy, System Availability) have an effect on Perceived Value. This could have the impact that, in order for a customer to have a good perceived value, there is a need to taking these variables into account.
3. With regard to E-Rec-Qual (level of recovery in the event of a service failure), only the Responsiveness variable affects the perceived value.

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