PARADIGMA

Quality Analysis of the BNI Mobile Banking Application for Customers Using Webqual 4.0

Yuni Eka Achyani[1], Yehezkiel Hardy Saputra[2]

[1,2] Sistem Informasi, Universitas Nusa Mandiri, Jakarta, Indonesia

ARTICLE INFORMATION	ABSTRACT

PT. Bank Negara Indonesia (Persero) Tbk. is a bank institution owned by the government of the Republic of Indonesia or better known as a state-owned company. In today's digital era, online services are the choice of most customers. This is because all types of banking transactions can be done easily. With the inclusion of smartphones as the devices most needed by the public at this time, BNI offers a mobile banking service called BNI Mobile Banking. This study will measure the quality of the BNI Mobile Banking application through the Webqual dimensions (usability, information quality, interaction quality) and the variable user satisfaction, namely BNI KCU Bogor customers. The data collection method uses primary data in the form of questionnaires distributed to 100 respondents. Data processing is done using SPSS. Based on data processing, it can be seen that the user's perception of ease of use, quality of information, quality of interaction is included in the very good category. Based on the results of the study, it was found that there was only an effect of usability and information quality and no effect of interaction quality on user satisfaction for BNI KCU Bogor customers. From the research results, it can be seen that the information quality variable contributes the largest contribution, namely 94.75% of the other variables

Corresponding Author:

Yuni Eka Achyani,
Sistem Informasi,
Universitas Nusa Mandiri,
Kp. Pulo RT. 001 RW.035 Desa Sumber Jaya Tambun Selatan, Bekasi, 17510,
Email: yuni.yea@nusamandiri.ac.id

INTRODUCTION

BNI Mobile Banking is an application developed by PT. Bank Negara Indonesia (Persero) Tbk. This application is a banking service facility that makes it easy for BNI customers to transact directly via smartphone safely, easily and quickly. The features available in BNI Mobile Banking include helping customers through balance information transaction services, telephone bill payments, credit card payments, airplane ticket payments, credit purchases, opening a Taplus account, opening a deposit account. The BNI Mobile Banking application can be installed and accessed by Android with a minimum version 5.0.0 (Lollypop) and the BNI Mobile Banking application is now available on version 5.8.0.

The BNI Mobile Banking application is an application that becomes a bridge between BNI and its customers, which is one of the reasons why the author chose the BNI Mobile Banking application as a research object. Almost various economic transactions can take advantage of the features contained in the BNI Mobile Banking application. This certainly makes it easier for BNI customers who have already downloaded the BNI Mobile Banking application.

So far, the BNI Mobile Banking application service that has been implemented does not have

sufficient evidence stating that the application can be accepted and considered by customers as one of the facilities that can provide speed, accuracy and convenience in providing information. Therefore, it is necessary to conduct research to find out whether the applied BNI Mobile Banking application is able to meet the criteria desired by customers both in terms of speed, accuracy and convenience. User behavior and reactions are also one of the factors to determine whether the quality of the application's facilities is good or not. The better the quality of the application that has been developed, the more motivated users, namely customers, are to continue using the features of the application. Measuring the quality of applications based on the perceptions and expectations of its users needs to be done to maintain the existence and success of these applications via the internet.

Barnes and Vidge argue that the quality of an application or website has three benchmark components, namely usability, information quality, and service interaction quality. These three components are part of the components in the Webqual method which can provide accurate information and provide an assessment of the feasibility of an application. The Webqual method has calculations based on the concept of Quality Function Deployment, a process that depends on the "voice of the customer" (A. Winarni and W. Riska, 2020).

Initially, the Servqual method proved to be widely used to assess the quality of services so that it was developed into the Webqual method which is very effective for measuring the quality of an application or website that originates from the perception of the end user (A. Sudradjat, S. Selviana, and W. Widiati, 2020) . Two kinds of parts of user perception, namely actual (perception of service received) and ideal (perception of service desired). The high actual perception factor and the low comparison between the actual and ideal perception factors are the benchmarks for a quality application/website.

To find out how good the quality of the BNI Mobile Banking application is, research is needed using the Webqual 4.0 method which focuses on Usability Quality, Information Quality, Service Interaction Quality, User Satisfaction or Overall) based on the perceptions of BNI KCU Bogor customers. The measurement of the quality of the BNI Mobile Banking application using the Webqual 4.0 method targets related application users, so that the quality measurement carried out can help BNI Mobile Banking application developers adjust the quality of the application according to customer perceptions.

Several previous studies related to this research include: Research conducted by Mala Kharisma and Sita Anggraeni, "The Influence of Bjb Net Service Quality on Customer Satisfaction of Bank Bjb Rasuna Said Using the Webqual 4.0 Method" explains that there is an influence of BJB Net service quality on customer satisfaction Bank BJB Rasuna Said uses the Webqual 4 method. The results of his research show that independent variables such as user quality, information quality and interaction quality can dominantly influence customer satisfaction in using the BJB net website service (M. Kharisma and S. Anggraeni, 2018).

Another research was conducted by Audina Faza and Agus Prasetyo Utomo on "Analysis of PT. Masusskita United Using the Webqual Method "shows that the Usability variable, the Information Quality variable, the User Interface variable, the Service Interaction variable have a positive and significant effect on the E-Customer Satisfaction variable, besides that the E-Customer Satisfaction variable has an effect on the E-Customer Loyalty variable. The final hypothesis is that positive attitudes and expectations of visitors are important factors for the growing interest of visitors to access PT. Masusskita United (A. Faza and A. P. Utomo, 2021).

Further research was conducted by Robby Yuli Endra and Deni Hermawan in "Analysis of website usage satisfaction (recap billing) at pt. cellular telecommunication uses the webqual 4.0 method" states that of the 3 criteria used to measure the Tokopedia.com website based on the Webqual 4.0 method, the overall quality of the Tokopedia.com website is quality (R. Y. Endra and D. Hermawan, 2022).

RESEARCH METHODE

1. Quality Analysis

The definition of analysis is the activity of thinking to explain a whole into simpler components so that you can find out the characteristics of the components, their relationship to one another, and the function of each in an integrated whole (D. S. Djaeng and B. Burhanudin, 2018).

Quality can be interpreted as ease of use. Another concept that emphasizes meeting customer expectations and quality is continuous improvement. Quality is a function of cost, where costs can be reduced by improving processes or reducing the variety of products or processes. Two important aspects serve as benchmarks for understanding quality, namely: (a) The nature of quality, namely the characteristics of the output of a process that is important to the customer. (b) The nature of the key to quality, namely the mix between the understanding of the customer and the process. Key (D. S. Djaeng and B. Burhanudin, 2018).

Wyckof defines service quality as the level of excellence expected and managing that level of excellence to meet consumer expectations. Parasuraman explained that there are two main factors that affect service quality, namely the service expected by consumers (expected service) and the service received by service users (perceived service). If the service received or experienced (perceived service) is in accordance with

the expected service, then the service quality is perceived as good and satisfying (Algifari, 2016).

From the definition above, the authors conclude that service quality is a company's ability to meet customer expectations by providing services to customers when interacting directly with customers.

2. Webqual 4.0

Webqual is a technique for measuring the quality of a website based on the perception of the end user. The Webqual 4.0 methodology is derived from the development of Webqual versions 1-3 and was also adapted and further developed by Servqual. Fauziah and Wulandari explained that this method consists of three variables that determine the quality of a website, namely usability, information quality and service interaction quality. These three methods can provide accurate information and provide an assessment of the effectiveness of the website (L. Setiyani, J. Wagiar, and E. Tjandra, 2020).

There are various versions of the Webqual model where each version is used in different studies also adapted to the population and research needs, namely: (a) WebQual 1.0 consists of 4 variables namely Usefulness, Easy of use, Entertainment, and Interaction, (b) Webqual 2.0 is divided into 3 different variables namely Quality of website, (c) Webqual 3.0 examines 3 variables for the quality of e-commerce websites, namely Usability, Information quality, and Quality of service interaction, (d) Webqual 4.0 derives from the development of Webqual versions 1 to 3 and is also adapted and developed from Servqual. Webqual 4.0 consists of 4 variables namely Usability, Information quality, Service quality, and Overall.(T. V. Susanto, Y. Yudiana, and L. Setiyani, 2022)

This was reinforced by Barnes & Vidgen stating that the dimensions of the Webqual 4.0 mode (J. Sistem et al., 2021) are as follows:

Table 1. Dimention of Webqual 4.0

Dimention	Webqual 4.0 Item
Usability	1. Ease to operate.
	2. The interaction between the user and the website is clear and understandable.
	3. Has easy-to-use navigation.
	4. The website address is easy to find.
	5. Has an attractive appearance.
	6. The layout of the information is clear.
	7. Display according to the type of government website.
	8. The website provides additional information.
Information Quality	9. Provide clear information.
	10. Provide reliable information.
	11. Provide up to date information.
	12. Provide relevant information.
	13. Provide information that is easy to understand when read.
	14. Provide detailed information.
	15. 15. Provide information in an appropriate format.
Service Interaction Quality	16. Have a good reputation.
	17. Get security to complete the transaction.
	18. Feeling safe in submitting personal data.
	19. Ease of attracting interest and attention.
	20. Has a community atmosphere.
	21. Easy to provide input (feedback).
	22. High level of trust in the information submitted by the website.

Source: (Candra Irawan, 2021)

The steps that need to be done in the Webqual 4.0 method include:

1. Normality Test

The normality test was carried out to test whether in the regression model the independent variables and the dependent variable or both have a normal distribution or not (I. Ghozali, 2015). To see whether the data that has been taken is normally distributed, you can use a Probability Plot (P-Plot) diagram.

2. Validity Test

The instrument validity test is intended to determine the precision and accuracy of the measuring instrument in carrying out its measuring function. In other words, a valid measurement instrument measures what it should measure, or measures what we want to measure.

A questionnaire is called valid if the questions on the questionnaire are able to describe something that will be measured by the questionnaire. If it is valid, it means that the measuring instrument used to get (measuring) data is valid. In addition, valid means that the instrument can be used to measure what should be measured.

To calculate the validity test, you can use the Pearson correlation formula as follows:

$$r = \frac{\sum(x_i - \bar{x})(y_i - \bar{y})}{\sum(x_i - \bar{x})^2 \sum(y_i - \bar{y})^2} \quad \dots\dots\dots\dots\dots\dots\dots(1)$$

r : Correlation coefficient
x : Item score
y : Total score

3. Reliability Test

To find out whether the values in the questionnaire are reliable or not, the questionnaire is tested with a reliability test using the alpha cronbach method.

For the calculation of the reliability test of the independent and dependent variables, you can use the Alpha Cronbach reliability formula as follows:

$$r_i = \left(\frac{k}{k-1}\right)\left(1 - \frac{\sum\sigma_b^2}{\sigma_t^2}\right) \quad \dots\dots\dots\dots\dots\dots(2)$$

r : Alpha reliability coefficient

k : Number of questions

$\sum \sigma_b^2$: The number of grain variants

σ_t^2 : Total variance

4. Calculation of the value of each dimension

For the calculation of the average yield value (mean) of each dimension of the independent and dependent variables, it is generated from the average (mean) formula as follows:

$$\bar{x} = \frac{\sum x_i}{n} \quad \text{……………………..…….(3)}$$

x : Average value (mean)
X : The sum of the mean values
n : Total data

5. Correlation Coefficient Calculation

This analysis was conducted to find out whether the relationship between the independent variables has a strong and positive relationship with the dependent variable and whether the variable is acceptable or not. The formula used at this stage is the same as the formula in the previous validity test, namely:

$$r = \frac{\sum(x_i - \bar{x})(y_i - \bar{y})}{\sum(x_i - \bar{x})^2 \sum(y_i - \bar{y})^2} \quad \text{…………………(4)}$$

r : Correlation coefficient
x : Item score
y : Total score

6. Calculation of Multiple Linear Regression Test

Linear regression is a measure of the relationship between two or more variables which is expressed in the form of a relationship or the existence of a dependency between one variable and another variable (B. Y. R. Kurniawan, 2016).

This analysis was conducted to determine the direction of the relationship between the independent variable and the dependent variable, whether each independent variable is positively or negatively related and predicts the value of the dependent variable if the value of the independent variable increases and decreases.

7. Calculation of the T Test

The t statistical test is useful for showing how far the influence of one independent variable partially or individually affects the dependent variable. For the calculation of the t test, you can use the arithmetic formula as follows:

$$t_i = \frac{\beta_i}{SE(\beta_i)} \quad \text{……………………………(5)}$$

t : T Test
SE : Standard Error
β_i: Beta Value

8. Calculation of Test F

The F test aims to determine whether the independent variable and the dependent variable have a reciprocal effect.
For the calculation of the f test, you can use the arithmetic formula as follows:

$$F = \frac{MSR}{MSE} , F_{(k,n-(k+1))} \quad \text{………………..(6)}$$
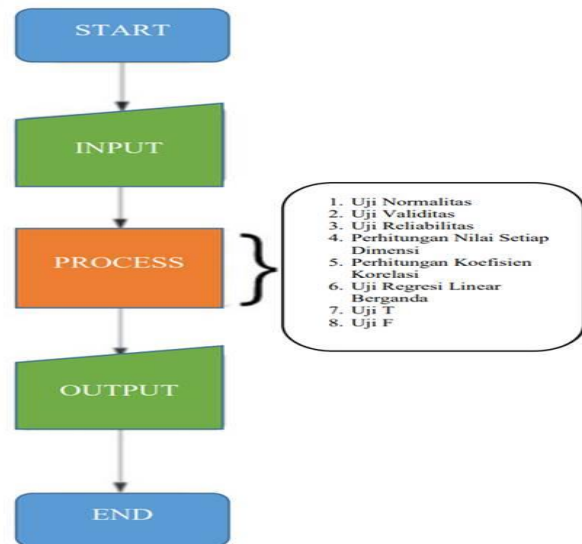
F : F Test
MSR : Mean Square Regression
MSE : Mean Square Error
k : Total of questions
n : Total data

5. Research Stages

The stages carried out in the analysis of the quality of the BNI Mobile Banking application for BNI KCU Bogor customers using the Webqual 4.0 method can be described as follows:

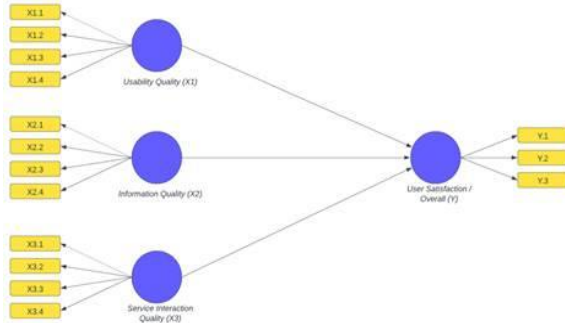Source: Research (2022)
Figure 1. Research Stages

At this research stage, the author began the process of inputting data into the website that the author created to help process data using the Webqual 4.0 method, where previous data had been collected from filling out questionnaires regarding the quality of the BNI Mobile Banking application which had been distributed to 100 BNI KCU Bogor customers. Then the data is processed by conducting tests in the form of validity tests, reliability tests, calculations for each dimension, correlation coefficients, multiple linear regression, t tests and f tests. After that the results of each test will be seen, so that you can know the output in the form of a conclusion from the test.

6. Methods of Data Collection

In collecting the data needed in writing this study several steps were used, including: (a) Observation Method, (b) Interview Method, (c) Literature Study Method, (d) Questionnaire Method.

7. Data Processing Methods

In this study the method that the authors use is the Webqual 4.0 method with quality testing that focuses on Usability Quality, Information Quality, Service Interaction Quality and an additional variable in the form of User Satisfaction [13]. The following is the research model used by the author:

Source: Research (2022)
Figure 2. Model *Webqual* 4.0

The research indicators used to compile the questionnaire are indicators of the quality of the WebQual 4.0 model based on research instruments which can be categorized into four variables, namely: usability, information quality, services interaction quality, and user satisfaction. The following indicators of each variable:

1. Usability Quality Includes easy to learn, easy to understand, easy to browse, easy to use, very interesting, displays a pleasing visual form, has good competence, provides a fun new experience.
2. Quality of Information (Information Quality)
Information is information that is processed in a form that is more useful and meaningful to the recipient. Information is important information that provides useful information (Setyani, at. al, 2020).
3. Quality of Service Interaction (Service Interaction Quality)
Includes the ability to provide a sense of security during transactions, have a good reputation, facilitate communication, create more personal emotional feelings, have confidence in storing user personal information, be able to create a more specific community, be able to provide confidence that promises made will be kept. The following indicators are used: (a) Have a good reputation (b) Store personal information securely (c) Feel safe while using the app (d) Can interact with service providers.
4. User Satisfaction
Includes application capabilities in helping user needs, facilitating a job, being effective and efficient in helping work, and providing a sense of satisfaction to users as a whole. The following indicators are used: (a) Application helps in banking transactions (b) Effective and efficient (c) Overall satisfied in using the application

8. Data Analysis

The questions that the author presents in the questionnaire consist of four categories with 15 questions where four questions regarding usability quality, four questions regarding information quality, four questions regarding service interaction quality and three questions regarding user satisfaction with the BNI Mobile Banking application. The following is a detailed list of questions on the questionnaire that the author distributed.

Table 2. Questionnaire Question List

Variable	No.	Questions
Usability Quality	1.	The BNI Mobile Banking application is easy to operate
	2.	Interaction with the application is easy to understand
	3.	This app has clear navigation
	4.	This application has an attractive appearance
Information Quality	5.	This application provides accurate information
	6.	This app provides reliable information
	7.	This application provides up to date information
	8.	This application provides information that is easy to understand
Interaction Quality	9.	This app has a good reputation
	10.	I feel my personal information is stored securely
	11.	I feel safe when using BNI Mobile Banking
	12.	I can easily contact CS through this application
User Satisfaction Quality	13.	This application helps me in banking transactions
	14.	This application is very effective and efficient
	15.	Overall I am satisfied using this application

Source: Research (2022)

The measurement scale is an agreement that is used as a reference for determining the short length of the interval in the measuring instrument, so that the measuring instrument can be used in a quantitative measurement (Sugiyono, 2015).

The analysis technique used in this study is a 5 (five) Likert scale point. Users are asked to rate the quality of each BNI Mobile Banking application using a scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). It is better to make the Likert scale odd to avoid the tendency of respondents to be neutral. The Likert scale can be used for parametric statistics such as multiple linear regression analysis. The research was carried out using a questionnaire, in which the primary data was collected by distributing a list of questions

(questionnaire).

9. Sampling Techniques

The population in this study is the average number of customers who come and visit BNI KCU Bogor to conduct banking transactions per day, which is around 133 customers.

The sampling technique or sampling method used in this study is simple random sampling in which the sampling technique from the population is carried out randomly. In order to determine the number of samples selected using the Slovin formula to measure the sample. Here's the formula:

$$n = \frac{N}{1+N.e^2} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots.(7)$$

n : Number of sampels
N : Total Populations
e : The researcher's level of confidence tolerates an error rate of 5% or 0.05, so:

$$n = \frac{133}{1 + 133.5\%^2}$$
$$n = \frac{133}{1 + 133.0,0025}$$
$$n = \frac{133}{1 + 0,3325}$$

n = 99,8 (rounded up to 100 respondents).

So it can be concluded that the sample that needs to be used in this study is targeting BNI Mobile Banking application users, namely 100 sample data.

RESULTS AND DISCUSSION

In this study, the authors distributed questionnaires using a Likert scale-based assessment to respondents, namely BNI KCU Bogor customers. The researcher uses the Webqual 4.0 method and focuses on usability quality, information quality, service interaction quality as independent variables and user satisfaction as the dependent variable. To carry out the calculations, the researcher built a simple application in the form of a website called BNI WebQual 4.0 The following is the appearance of the website that has been created:
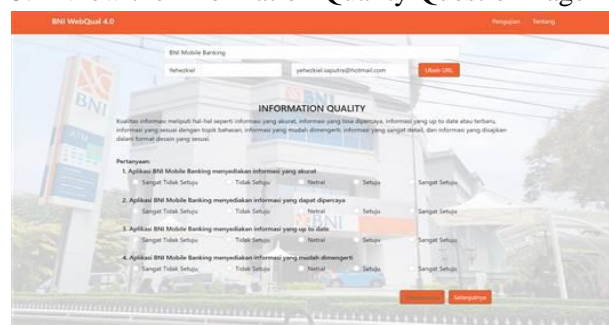
1. Home page

Source: Research (2022)
Figure 3. Display of the BNI WebQual 4.0 Application Homepage
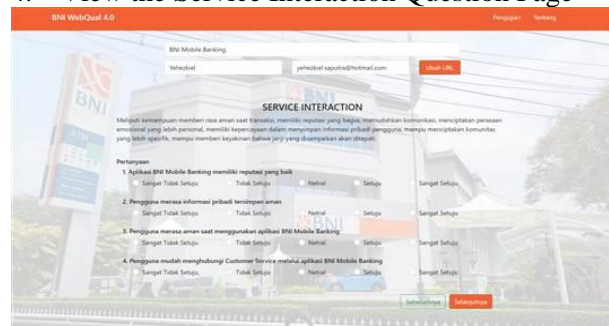
2. Display the Usability Question Page
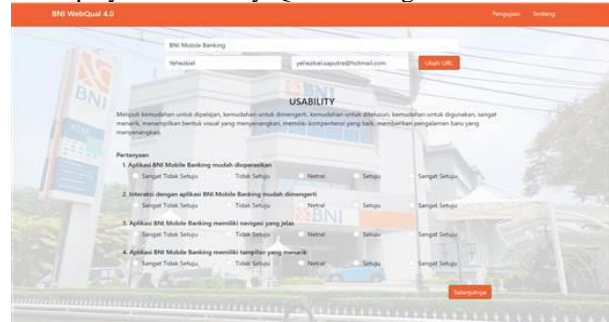
Source: Research (2022)
Figure 4. Display of Usability Questions

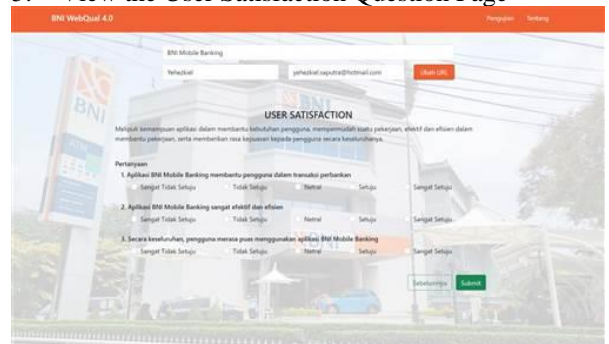3. View the Information Quality Question Page

Source: Research (2022)
Figure 5. Information Quality Question Display

4. View the Service Interaction Question Page

Source: Research (2022)
Figure 6. Display Service Interaction Questions

5. View the User Satisfaction Question Page

Source: Research (2022)
Figure 7. Display User Satisfaction Questions

6. Display Results Summary Page

Source: Research (2022)

Figure 8. Results Summary Display

7. Display Dimension Information Point Explanation

Source: Research (2022)

Figure 11. Explanation of Information Dimensions

8. Display Dimension Service Interaction Point Explanation

Source: Research (2022)

Figure 12. Explanation of Service Interaction Dimensions

9. Display Dimension User Satisfaction Point Explanation

Source: Research (2022)

Figure 13. Explanation of User Satisfaction Dimensions

1. Research Instruments

The author has created an online questionnaire which can be accessed at the address: https://bit.ly/yehezkiel-survei-bni. After distributing the questionnaires to 100 BNI KCU Bogor customers, complete data were obtained regarding the profiles of respondents who were part of the research object which can be seen as follows:

Table 3. Classification of Respondents

Classification	Amount	Percentage
Gender		
Male	47	47 %
Female	53	53 %
Total	100	100 %

Source: Research (2022)

The table above shows that there are more female respondents than male respondents. Only 47% of male respondents and 53% of female respondents. This shows that the female gender is the user of the BNI Mobile Banking application more than the male.

2. Normality Testing

The Normality Test aims to test whether the independent variables and dependent variables in the model are equally distributed normally or not. The normality of the data in this study is proven by observing the Normal P-Plot of Regression Standardized Residual points.
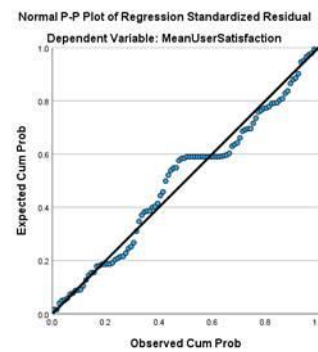
Source: Research (2022)

Figure 14. Normality Test Results

Based on the picture above, it can be seen that the normal graph shows that the points are spread in such a way that they always follow and approach the diagonal line. Therefore, the normal distribution of the residual values can be used as a basis for decision making or as a tool for decision making in the normality test of the probability diagram technique. Therefore, the assumption of normalizing the residual value of simple linear regression analysis in this study can be realized.

3. Validity Testing

The instrument validity test is intended to determine the precision and accuracy of the measuring instrument in carrying out its measuring function. In other words, a valid measurement instrument measures what it should measure, or measures what we want to measure. From the results of the validity test it is known that the test results are all valid. Interpretation to see the results of validity, that is, pay attention to the value of r count, that is, r count > R table, it is said to be valid. For

the number of samples = 100, the value of R table with a significance level of 0.05 is 0.165, it is concluded that the data obtained for the independent and dependent variables have valid values.
df = 100-2 = 98, R table with df = 98, which is 0.165
Example of manual calculation with the formula:

$$r = \frac{\sum(x_i - \bar{x})(y_i - \bar{y})}{\sum(x_i - \bar{x})^2 \sum(y_i - \bar{y})^2}$$

In Usability1:
$\bar{x} = 4{,}71$
$\bar{y} = 71{,}02$
$\sum(x - \bar{x})^2 = 52{,}59$
$\sum(y - \bar{y})^2 = 11735{,}96$
$\sum(x - \bar{x})(y - \bar{y}) = 722{,}58$
$r = \frac{722{,}58}{\sqrt{(52{,}59 \times 11735{,}96)}} = 0{,}9197$
(rounded to 0.920)

It is proven that the results of manual calculations with the SPSS output results show the same number.

Table 4. Usability Validity Test Results

Quality Measurement	Usability			
	Usability1	Usability2	Usability3	Usability4
Korelasi Pearson	0.920	0.958	0.965	0.910
Nilai R Tabel	0.165	0.165	0.165	0.165
Keterangan	Valid	Valid	Valid	Valid

Source: Research (2022)

Table 5. Information Validity Test Results

Quality Measurement	Information			
	Info1	Info2	Info3	Info4
Korelasi Pearson	0.938	0.970	0.941	0.939
Nilai R Tabel	0.165	0.165	0.165	0.165
Keterangan	Valid	Valid	Valid	Valid

Source: Research (2022)

Table 6. Service Interaction Validity Test Results

Quality Measurement	Service Interaction			
	Service1	Service2	Service3	Service4
Korelasi Pearson	0.950	0.946	0.934	0.958
Nilai R Tabel	0.165	0.165	0.165	0.165
Keterangan	Valid	Valid	Valid	Valid

Source: Research (2022)

Table 7. User Satisfaction Validity Test Results

Quality Measurement	User Satisfaction		
	User1	User2	User3
Korelasi Pearson	0.938	0.970	0.941
Nilai R Tabel	0.165	0.165	0.165
Keterangan	Valid	Valid	Valid

Source: Research (2022)

4. Reliability Testing

To find out whether the survey scores were reliable or not, the questionnaire was tested using a reliability test according to the Alpha Cronbach method.

Cronbach's Alpha Rating Range includes: (a) alpha < 0.50 classified as low reliability, (b) 0.50 < alpha < 0.70 moderate reliability, (c) alpha > 0.70 classified as sufficient reliability, (d) alpha > 0.80 classified as strong reliability, (e) alpha > 0.90 classified as perfect reliability

The smaller the alpha value indicates the more unreliable items. The standard used is alpha > 0.70 (sufficient reliability).
Example of manual calculation with the formula:

$$r_i = \left(\frac{k}{k-1}\right)\left(1 - \frac{\sum \sigma_b^2}{\sigma_t^2}\right)$$

$$r_{x1} = \left(\frac{4}{4-1}\right)\left(1 - \frac{1-(0{,}3044+0{,}3811+0{,}329+0{,}4285)}{3{,}6214}\right)$$

$$r_{x1} = \left(\frac{4}{3}\right)\left(1 - \frac{1-0{,}97325}{3{,}6214}\right)$$

$$r_{x1} = \left(\frac{4}{3}\right)(1 - 0{,}26875)$$

$$r_{x1} = \left(\frac{4}{3}\right)(0{,}73125)$$

$r_{x1} = 0{,}975$

It is proven that the results of manual calculations with the SPSS output results show the same number.

Table 8. Reliability Test Results

Pengukuran Kualitas	Usability	Information	Service Interaction	User Satisfaction
Nilai Cronbach Alpha	0.975	0.976	0.987	0.983
Nilai Acuan	0.7	0.7	0.7	0.7
Keterangan	Reliabel	Reliabel	Reliabel	Reliabel

Source: Research (2022)

5. Calculation of the Value of Each Dimension

Here the researcher presents the calculation of the average (mean) of each dimension in the form of a percentage with an average mean value of 94.7% which indicates the quality of the BNI Mobile Banking application is very satisfactory.
Example of manual calculation with the formula:

$$\bar{x} = \frac{\sum x_i}{n}$$

$$\bar{x}_i = \frac{377{,}4}{4}$$

$$\bar{x}_i = 94{,}35$$

6. Correlation Coefficient Calculation

This analysis was conducted to find out whether the relationship between the independent variables has a strong and positive relationship with the dependent variable and whether the variable is acceptable or not. The formula used at this stage is the same as the formula in the previous validity test.
Example of manual calculation with the formula:

$$r = \frac{\sum(x_i - \bar{x})(y_i - \bar{y})}{\sum(x_i - \bar{x})^2 \sum(y_i - \bar{y})^2}$$

Pada Usability:
$\bar{x} = 4{,}71$
$\bar{y} = 71{,}02$

$$\sum(x - \bar{x})^2 = 48,77$$
$$\sum(y - \bar{y})^2 = 11735,96$$
$$\sum(x - \bar{x})(y - \bar{y}) = 722,58$$
$$r = \frac{722,58}{\sqrt{(48,77 \times 11735,96)}} = 0,955$$

It is proven that the results of manual calculations with the SPSS output results show the same number.

Table 10. Pearson Correlation Coefficient Calculation Results

Pengukuran Kualitas	Usability	Information	Service Interaction
Korelasi Pearson	0.955	0.953	0.920
Dalam %	95.5	95.3	92
Sig (2-tailed)	<0.001	<0.001	<0.001

Source: Research (2022)

The value of r table for significance of 5% and n = 100 is 0.195. It means:

The Usability variable (X1) has a value of 0.955 and because 0.955 > 0.195 and the sig (2-tailed) value is less than 0.05, the usability variable has a relationship or correlation with the User Satisfaction (Y) variable.

The Information variable (X2) has a value of 0.953 and because 0.953 > 0.195 and the sig (2-tailed) value is less than 0.05, the information variable has a relationship or correlation with the User Satisfaction (Y) variable.

The Service Interaction variable (X3) has a value of 0.920 and because 0.920 > 0.195 and the sig (2-tailed) value is less than 0.05, the service information variable has a relationship or correlation with the User Satisfaction (Y) variable.

7. Calculation of Multiple Linear Regression Test
This analysis was conducted to determine the direction of the relationship between the independent variable and the dependent variable, whether each independent variable is positively or negatively related and predicts the value of the dependent variable if the value of the independent variable increases or decreases.

Example of manual calculation with the formula:

$$A = \begin{bmatrix} N & \sum x_1 & \sum x_2 & \sum x_3 \\ \sum x_1 & \sum(x_1 x_1) & \sum(x_1 x_2) & \sum(x_1 x_2) \\ \sum x_2 & \sum(x_2 x_1) & \sum(x_2 x_2) & \sum(x_1 x_2) \\ \sum x_3 & \sum(x_3 x_1) & \sum(x_3 x_2) & \sum(x_1 x_2) \end{bmatrix}$$

Number of rows or respondents = 100
|A| = 100 * K₁ - ∑x₁ * K₂ + ∑x₂ * K₃ - ∑x₃ * K4
Value b0 (Beta 0) = |A1| / |A|, b0 = 0,920

It is proven that the results of manual calculations with the SPSS output results show the same number.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.959ᵃ	.920	.917	.19499

a. Predictors: (Constant), MeanInteraction, MeanInformation, MeanUsability

Source: Research (2022)

Figure 15. *Model Summary*

The "Model Summary" table provides information about the value of the coefficient of determination, namely the contribution or contribution of the influence of variable X to variable Y. Based on the data above, it shows that the value of the coefficient of determination or R square is 0.920 or equal to 92%. This means that the variables Usability (X1), Information (X2) and Service Interaction (X3) simultaneously or together influence the User Satisfaction (Y) variable by 92%. While the rest (100% - 92% = 8%) is influenced by other variables outside the regression equation or variables not examined.

8. Calculation of the T Test
The t statistical test basically shows how far the influence of one independent variable partially or individually affects the dependent variable.
t_i=β_i/(SE(β_i))
t_(x_i)=0.327/0.146=2.240

It is proven that the results of manual calculations with the SPSS output results show the same number.

$$t_i = \frac{\beta_i}{SE(\beta_i)}$$
$$t_{x_i} = \frac{0,327}{0,146} = 2,240$$

It is proven that the results of manual calculations with the SPSS output results show the same number.

Coefficientsᵃ

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	.620	.129		4.818	<.001
	MeanUsability	.376	.168	.410	2.240	.027
	MeanInformation	.366	.157	.395	2.331	.022
	MeanInteraction	.140	.074	.165	1.900	.060

a. Dependent Variable: MeanSatisfaction

Source: Research (2022)

Figure 16. T Test Calculation Coefficient

T table value for 0.05/2; 96 (Residual Value) or equal to (0.025; 96)) is 1.988.
To carry out the T test, there are two references that the authors can use as a basis for making decisions, first by looking at the significance value (Sig), and secondly by comparing the calculated t value with the t table.

Based on Significance Value (Sig.): (1) If the value is Significance (Sig). < Probability 0.05, so there is an influence of the independent variable (X) on the dependent variable (Y) so that the hypothesis is accepted.

(2) If the value is Significance (Sig). > Probability 0.05, so there is no effect of the independent variable (X) on the dependent variable (Y) so the hypothesis is rejected.

Based on a comparison of the value of t count with t table: (1) If the value of t count > t table, then there is an influence of the independent variable (X) on the dependent variable (Y) so that the hypothesis is accepted. (2) If the value of t count < t table then there is no effect of the independent variable (X) on the dependent variable (Y) so that the hypothesis is rejected.

Based on the SPSS "Coefficients" output table above, it is known that the Significance (Sig) value of the Usability variable (X1) is 0.027. Because the value of Sig. 0.027 <probability of 0.05, it can be concluded that H1 or the first hypothesis is accepted. This means that there is an effect of Usability (X1) on User Satisfaction (Y). In addition, because the t value > t table value is 2,240 > 1,988, there is an influence on Usability (X1) on User Satisfaction (Y).

Based on the SPSS "Coefficients" output table above, it is known that the Significance (Sig) value of the Information variable (X2) is 0.022. Because the value of Sig. 0.022 <probability of 0.05, it can be concluded that H2 or the second hypothesis is accepted. This means that there is an influence of Information (X2) on User Satisfaction (Y). Besides that, because the t value > t table value is 2,331 > 1,988, there is an influence of Information (X2) on User Satisfaction (Y).

Based on the SPSS "Coefficients" output table above, it is known that the Significance (Sig) value of the Interaction variable (X3) is 0.060. Because the value of Sig. 0.060 > probability 0.05, it can be concluded that H3 or the third hypothesis is rejected. This means that there is no influence of Interaction (X3) on User Satisfaction (Y). In addition, because the t value < t table value is 1,900 < 1,988, there is no effect of Interaction (X3) on User Satisfaction (Y).

9. Calculation of Test F

The F test aims to determine whether the independent variable and the dependent variable have a reciprocal effect.

$$F = \frac{MSR}{MSE}, F_{(k, n-(k+1))}$$
$$F = \frac{13,993}{0,038} = 366,443$$

It is proven that the results of manual calculations with the SPSS output results show the same number.

ANOVAᵃ

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	41.799	3	13.933	366.443	<.001ᵇ
	Residual	3.650	96	.038		
	Total	45.449	99			

a. Dependent Variable: MeanSatisfaction

b. Predictors: (Constant), MeanInteraction, MeanInformation, MeanUsability

Sumber: Pengolahan Data Penelitian (2022)

Figure 17. *Anova Test Calculations F*

The value of F table is (k; n – k) where k is the number of independent or independent variables (X) and n is the number of respondents. So the value of the F table is the value (3 ; 100 – 3), namely the value of the F table (3 ; 97) is 2.70.

The "ANOVA" table provides information about whether there is an influence of variable X on variable Y. There are two ways that the authors can use as a reference or guideline for conducting hypothesis testing in test F. The first is to compare the significance value (Sig.) or the probability value of the ANOVA output. . The second is to compare the calculated F value with the table F value.

Based on the Significance Value (Sig.) of the Anova Output: (1) If the value of Sig. <0.05, then the hypothesis is accepted, meaning that the X variable affects the Y variable. (2)If the value of Sig. > 0.05, then the hypothesis is rejected, meaning that the X variable has no effect on the Y variable.

Based on a comparison of calculated F values with F tables: (1) If the value of F count> F table, then the hypothesis is accepted, it means that variable X affects variable Y. (2) If the calculated F value <F table, then the hypothesis is rejected, it means that the X variable has no effect on the Y variable.

Based on the SPSS output table above, it is known that the Sig. is equal to < 0.001. Because the value of Sig. 0.001 <0.05, then according to the basis of decision making in the F test it can be concluded that the hypothesis is accepted or in other words usability, information and service interaction (X) simultaneously affect user satisfaction (Y).

According to the SPSS output table above, the calculated F value is 366.443. Because the calculated F value is 366.443 > F table 2.70, as the basis for decision making in the F test it can be concluded that the hypothesis is accepted or in other words usability, information and service interaction (X) simultaneously affect user satisfaction (Y).

10. Yield Potential

Based on the results of the analysis using the Webqual 4.0 method with the help of calculations using SPSS, several potential results are obtained, including:

Usability variables (X1) and information (X2) have an influence on user satisfaction (Y). Meanwhile, the service interaction variable (X3) has no effect on user satisfaction (Y). In addition, the information variable contributes the greatest influence to user satisfaction when compared to usability. Therefore, it is also necessary to improve in terms of appearance (user interface) so that the value of user satisfaction increases.

Based on the previous data analysis, the variable data that has the lowest value is variable X3 (Service Interaction). Therefore, it is necessary to increase this section, especially in the data security section of the account owner and the need for feature updates and convenience for BNI customers to communicate with Customer Service through the BNI Mobile Banking application.

CONCLUSION

Based on the results of the quality analysis of the BNI Mobile Banking application, it can be concluded that the application of the WebQual 4.0 method has an impact on the quality of the application for BNI KCU Bogor customers to further improve the quality of the BNI Mobile Banking application. Following are some conclusions on the percentage of scores obtained, namely: (1) The application usability variable (Usability) has a value of 94.35% with a very good quality value, (2) The information quality variable in the application (Information Quality) has a value of 94.75% with a very good quality value, (3) The variable quality of service information (Service Interaction Quality) has a value of 94.2% with a value of very good quality. (4) The Customer satisfaction variable (Service User Satisfaction) has a value of 95.73% with a very good quality value.

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