

The Effect of Service Innovation and Self Service Technology on Customer Satisfaction PT Bank Negara Indonesia (Persero) Tbk Kc Medan

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Keywords: Service Innovation, Self Service Technology, E-Satisfaction.

Abstract: This study aims to identify and analyze service innovation and self service technology on e-satisfaction at PT Bank Negara Indonesia (Persero) Tbk during February to April 2022. Currently, the banking industry is competing to develop technology-based products and services. In order to compete, survive, and thrive, the banking industry must make new innovations to provide convenience to customers in meeting customer needs. Innovation in the banking industry can be done by adopting various self service technologies (SST). Service innovations such as service concept, customer interface, service development and delivery, and technological options are taken into consideration in measuring customer satisfaction. Self service technology such as functionality, enjoyment, security/privacy, design, convenience, customization, and assurance are also considered in measuring customer satisfaction. This research is a quantitative research with causal associative research. The population in this study are customers of PT Bank Negara Indonesia (Persero) Tbk who have used BNI mobile banking. The sampling technique used was random sampling so that there were 100 customers who were the samples in this study. The results showed that service innovation and self service technology had a positive and significant effect on e-satisfaction.

1 INTRODUCTION

Technological developments affect companies in carrying out their functions in order to survive in the current market. The invention of increasingly sophisticated technology is intended to provide positive benefits for life while simplifying human work. Almost all daily human activities are supported by this technology, not least in running the business that occurs in the company, including in the banking sector. Currently, the banking industry is competing to develop both technology-based products and services. In order to compete, survive, and thrive, the banking industry must make new innovations to provide convenience to customers in meeting customer needs. This is in line with what Lovelock (2012) stated that the service sector is the sector that experiences the biggest changes due to the rapid changes experienced by other factors such as technological changes which directly increase the competitive climate in the banking industry.

The banking industry needs to innovate in combining digital technology with customer

interaction, in this case the findings of these new technologies must make it easier and provide convenience for customers in accessing banking services. According to Kotler & Keller (2009) innovation is related to new things that are created as a form of breakthrough to products, services, ideas, and perceptions from someone which can be in the form of new products, development of new products, design changes, technical innovations, and so on. new business ideas or new processes. Innovation in the banking industry can be done by adopting various kinds of self service technologies (SST) (Orel and Kara, 2013). Meuter et al (2000) define self service technologies as technological interfaces that allow consumers to produce a service independently of the direct involvement of company employees. Self service technologies are expected to provide customer satisfaction through information technology-based services such as performance, information, security and sensation in using e-banking.

According to Kotler and Keller (2009) satisfaction is a person's feelings of pleasure or

disappointment arising from comparing the perceived performance of the product (or outcome) against their expectations.

The digitalization trend that demands speed and convenience makes PT Bank Negara Indonesia (Persero) Tbk continue to innovate to meet the needs of its customers. Especially in services through self-service technology which is expected to be easier, faster, and more reliable to use in transactions. In order to meet the different needs of each customer, PT Bank Negara Indonesia (Persero) Tbk always makes efforts to improve customer mobile banking transactions. The following is a table of BNI mobile banking users from January to March 2022 in Medan City.

Table 1: Number of BNI Mobile Banking Users in Medan City January – March 2022.

Month	Number of Users
January	83%
February	19%
March	63%

Source: <https://trends.google.com>.

Table 1. shows that BNI mobile banking users from January to March 2022 in Medan City fluctuated. This indicates customer.

Previous research conducted by Sakun Boon Itt (2015) showed that self-service technology positively affects e-satisfaction. Meanwhile, research by Evan Setiawan (2016) reveals that self-service technology leads to reduced interactions between company employees and customers to create results from services. According to McCollough in Evan Setiawan (2016) the relationship between service failure and customer satisfaction can be explained by looking at initial disconfirmation and recovery disconfirmation. Previous research on the effect of service innovation on e-satisfaction was conducted by Rew (2020) which showed that innovation in service companies positively affects customer satisfaction. Research conducted by Simon (2020) found that not all dimensions of innovation affect satisfaction.

Based on the description above, in connection with the importance of knowing the effect of service innovation and self service technology in increasing customer satisfaction, the authors are interested in conducting research with the title:

"The Influence of Service Innovation and Self Service Technology on Customer Satisfaction of PT Bank Negara Indonesia (Persero) Tbk KC Medan".

2 LITERATURE REVIEW

2.1 Service Innovation

According to Drucker (2012), innovation is a specific tool for companies where innovation can explore or take advantage of changes that occur as an opportunity to run a different business. Innovation is related to new things that are created as a form of breakthrough to products, services, ideas, and perceptions from someone which can be in the form of new products, development of new products, design changes, technical innovations, to new business ideas or new processes. (Kotler & Keller, 2009). According to (Delafrouz et al, 2013) service innovation can make consumers very satisfied with the services provided. With this innovation, there will be continuous quality improvement so that consumers will feel more satisfied and reluctant to switch to other products or companies:

Hertog (2010) defines service innovation in a four-dimensional model as follows:

1. Service Concept
Creation of new concepts in services in specific markets.
2. Customer Interface
Refers to the process of interface interaction between service providers and consumers because this process is included in the process of creating services and value. The interface can be face-to-face, or through electronic media.
3. Service Development and Delivery
Service development and delivery. These activities involve infrastructure, processes, and employees to produce and deliver services to consumers.
4. Technological Options
Choice of technology used, especially information technology. This is important for services because it allows for greater efficiency and effectiveness.

2.2 Self Service Technology (SST)

The term "SST" was first used by Meuter et al (2000). SST is defined as a technology interface that allows consumers to produce a service independently from the direct involvement of company employees. Continuous progress from traditional service delivery to modern SST is essential for all service industries. Moreover, many customers turn to internet-based services because they find it easy to use, fun, and convenient (Meuter et al., 2000).

According to Hsieh et al (2006) there are seven dimensions of self-service technology (SST) quality, namely:

1. **Functionality**
This dimension represents the functional characteristics of self-service technology (SST), namely:
 - a. **Reliability (reliability)**
Is the power to provide guaranteed services reliably and on target.
 - b. **Responsiveness (responsiveness)**
Is the ability of SST devices to respond to commands entered into the system by customers.
 - c. **Simple and easy to use**
Is the SST device can be operated easily and requires little effort.
 - d. **Respond to requests quickly**
Is the service on the SST device can be completed in a short time.
2. **Enjoyment**
It is the perception of pleasure and interest that the user encounters while using and after using the SST device.
3. **Security/Privacy**
Refers to freedom from risk or doubt that the user will feel. The facilities provided by the SST device in building a sense of security and comfort for consumers in their operation.
4. **Design**
Covers the overall look of the SST, which gives it a good aesthetic appearance. The beauty of the shape and arrangement of the SST device to create an attractive appearance for the user.
5. **Assurance**
Describing confidence because of the reputation and competence of the SST device that prioritizes trust because of the reputation and competence of the SST provider. Assurance can create a sense of security for its consumers.
6. **Convenience Dimension of convenience**
Describes the accessibility of SST services, with the ease and convenience of SST services to use.
7. **Customization**
This is the dimension in which SST devices can be changed to suit consumer preferences and desires. Aims to understand and meet user needs without being fixated on the structure of the system.

2.3 *E-Satisfaction*

The word satisfaction comes from the Latin "satis" (meaning good enough, adequate and "facio" to do or

make). Satisfaction, according to Oliver (1997) is "a summary of the psychological states that result when emotions around unconfirmed expectations are combined with consumers' prior feelings about the consumer experience." From his point of view, "satisfaction is perhaps best understood as the ongoing evaluation of the surprise inherent in the product acquisition and/or consumption experience."

The dimensions of satisfaction by Hawkins and Looney in Tjiptono (2011) are reviewed from 6 aspects as follows:

1. **Overall Customer Satisfaction (Overall Customer Satisfaction)**
Considering the level of customer satisfaction of the company's services and compare them with competitors' services as a whole.
2. **Dimensions of Customer Satisfaction**
By identifying the dimensions that are the core of customer satisfaction based on specific items that most influence overall customer satisfaction .
3. **Conformance of Expectations (Confirmation of Expectation)**
Obtained on the basis of conformity or discrepancy between customer expectations regarding the quality of products or services from the company.
4. **Repurchase Intent (Repurchase Intent)**
Customer satisfaction or not is obtained from seeing whether there will be a repeat purchase of a product from the same customer .
2. **Willingness to Recommend (Willingness to Recommend)**
Here can be seen customer loyalty to promote either directly or indirectly the company's services to others.
3. **Customer Dissatisfaction (Customer Dissatisfaction)**
Aims to re-examine what aspects of customer dissatisfaction.
In this study, to evaluate customer satisfaction, the indicators used according to Tjiptono (2014) are as follows:
 1. Conformance of expectations
 2. Interest in visiting or repurchasing
 3. Willingness to recommend

2.4 **Relationship of Service Innovation to *E-Satisfaction***

E-Satisfaction is a measuring tool for companies to survive in a competitive market environment. In the research of Rew, et al. (2020) explains that customer satisfaction can be generated from the customer's experience in using the service, besides the system

used by consumers in running the service can increase consumer satisfaction. So with service innovation, it can encourage customers to play an active role in the service process. Innovation explicitly increases the company's opportunities to meet very high customer needs, so companies can easily create customer satisfaction. In the banking sector, service innovation measures the effectiveness provided to customers and can create customer satisfaction and loyalty. Thus, the hypotheses related to service innovation on e-satisfaction are as follows:

H1: Service Innovation has a positive effect on E-Satisfaction

2.5 Relationship of Self Service to E- Satisfaction

Self service technology is defined as an interface technology that allows consumers to produce a service independently of the direct involvement of company employees (Meuter et al, 2000). Sakun Boon Itt's research (2015) shows that self-service technology positively affects e-satisfaction. E-Satisfaction comes from customer expectations, in this case self service technology will meet customer expectations in its service. Manual service sometimes creates problems, given the inevitably long queues. So it appears, there is a gap between expectations and the reality of the service received by customers. Self service technology actually fills this gap. Customers who want fast and accurate service will greatly benefit from responding to the application of technology. So that self-service technology will have a positive effect on e-satisfaction. So the hypothesis related to self service technology on e-satisfaction is as follows:

H2: Service Innovation has a positive effect on E-Satisfaction

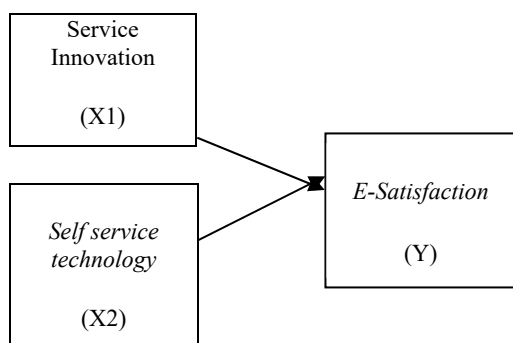


Figure 1. Conceptual Framework.

3 RESEARCH METHOD

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The copyright form is located on the authors' reserved area.

The form should be completed and signed by one author on behalf of all the other authors.

3.1 Types of Research

The type of research used in this study is causal which aims to analyze how one variable affects other variables. This study was to analyze the effect of service innovation and self service technology on e-satisfaction. This research was conducted at PT Bank Negara Indonesia (Persero) Tbk starting from February to April 2022.

3.2 Population and Sample

The population in this study are people who have used BNI mobile banking. The sampling technique in this study used a random sampling technique, namely a sampling technique in which all individuals in the population either individually or together are given the same opportunity to be selected as sample members.

In determining the sample, if the population is large and the number is unknown, then according to Widiyanto (2008:35) the formula is used:

H2: Service Innovation has a positive effect on E-Satisfaction

$$n = \frac{Z^2}{4 (Moe)^2}$$

Information :

n = number of samples

Z = Z value with 95% confidence level

then the value of Z = 1.96 (distribution table normal)

Moe = margin of error or maximum error

is 10%. By using a margin of error of 10%, the minimum number of samples that can be taken is:

$$n = 1.962 / 4 (0.10)^2$$

$$n = 96.04 \text{ which is rounded to } 97$$

In order for this study to be more fit, in this study a sample of 100 people was taken. The reason the sample is rounded up to 100 people is because if one

of the questionnaires contains data that is not valid, it can use the more filling in the questionnaire. The number of respondents as many as 100 people is considered representative because it is greater than the minimum sample limit.

4 RESULTS AND DISCUSSION

4.1 Validity and Reliability Test

4.1.1 Validity Test

The validity test was carried out with the aim of testing the validity of each question item on the questionnaire that had been designed. A question item is said to be valid if the correlation value (R h count) of the question item > R table (0.361) . Table 4. 1 presents the results of the validity test for each question item from the questionnaire.

Table 4.1 Validity Test of Questionnaire Question Item

P	R Count	R Table	Results
Y11	0.769	0.361	Valid (R Count > R Table)
Y12	0.618	0.361	Valid (R Count > R Table)
Y13	0.78	0.361	Valid (R Count > R Table)
Y14	0.863	0.361	Valid (R Count > R Table)
X11	0.815	0.361	Valid (R Count > R Table)
X12	0.877	0.361	Valid (R Count > R Table)
X13	0.888	0.361	Valid (R Count > R Table)
X14	0.763	0.361	Valid (R Count > R Table)
X15	0.849	0.361	Valid (R Count > R Table)
X16	0.877	0.361	Valid (R Count > R Table)
X17	0.855	0.361	Valid (R Count > R Table)
X18	0.882	0.361	Valid (R Count > R Table)
X21	0.762	0.361	Valid (R Count > R Table)
X22	0.761	0.361	Valid (R Count > R Table)
X23	0.65	0.361	Valid (R Count > R Table)
X24	0.804	0.361	Valid (R Count > R Table)

A question is said to be valid if the value of R count > 0.3 61 (R table) . It is known that all calculated R values are > 0.3 61 (R table) . So it can be concluded that all of the questionnaires are valid.

4.1.2 Reliability Test

Reliability testing must be done only on questions that already have or meet the validity test, so if it doesn't meet the validity test requirements then it doesn't need to be continued for reliability testing . The following are the results of the reliability test on valid question items.

Table 4.2 Reliability Test

Variable	Cronbach's Alpha	Results
E-Satisfaction (Y)	0.882	Reliable
Self Service (X1)	0.959	Reliable
Service Innovation (X2)	0.88	Reliable

If the value of Cronbach's Alpha greater than 0.6, then the research questionnaire is reliable. It is known that the questionnaire is reliable, because all values of Cronbach's Alpha greater than 0.6.

4.2 Descriptive Statistical Analysis

In the descriptive analysis section, the minimum, maximum, average and standard deviation values are presented based on e-satisfaction, self service technology and service innovation.

Table 4.3 Descriptive Statistics

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
E-Satisfaction (Y)	100	2.75	4.75	3.8075	.45762
Self Service (X1)	100	1.38	5.00	3.7300	.70526
M-Payment(X2) Innovation	100	1.25	5.00	3.5950	.66646
Valid N (listwise)	100				

Based on Table 4.3, it is known that the minimum value of e-satisfaction is 2.75, while the maximum value of e-satisfaction is 4.75. The average e-satisfaction is 3.8075, with a standard deviation of 0.45762. It is known that the minimum value of self-service is 1.38, while the maximum value of self-service is 5. The average value of self-service is 3.7300, with a standard deviation 0.70526. It is known that the minimum value of m-payment innovation is 1.25, while the maximum value of m-payment innovation is 5. The average value of m-payment innovation is 3.5950, with a standard deviation of 0.66646.

4.3 Classical Assumption Test

4.3.1 Normality Test

The normality test aims to test whether in the regression model, the confounding or residual variables have a normal distribution. Test and assume that the residual value follows a normal distribution. In this study, the normality test of the residuals using the Kolmogorov-Smirnov test. The level of significance used is $\alpha=0,05$. The basis for making decisions is to look at the probability numbers p, with the following conditions. the probability value is $p \geq 0.05$, then the assumption of normality is met. If the probability < 0.05 then the assumption of normality is not met.

Table 4.4 Normality Test

One-Sample Kolmogorov-Smirnov Test			Unstandardized Residual
N			100
Normal Parameters ^{a, b}	mean		.0000000
	Std. Deviation		.39233875
Most Extreme Differences	Absolute		.046
	Positive		.045
	negative		-.046
Kolmogorov-Smirnov Z			.459
asympt. Sig. (2-tailed)			.984

- a. Test distribution is Normal.
- b. Calculated from data.

Note that based on Table 4.4, the probability value for Asymp. Sig. (2-tailed) of 0.984. Due to the probability value p, which is 0.984, greater than the level of significance, which is 0.05. This means that the data is normally distributed.

4.3.2 Multicollinearity Test

To check whether there is multicollinearity or not, it can be seen from the value of the variance inflation factor (VIF). A VIF value that is more than 10 indicates that an independent variable has multicollinearity (Ghozali, 2013).

Table 4.5 Multicollinearity Test

Model	Collinearity Statistics	
	Tolerance	VIF
1 (Constant)		
Self Service (X1)	.998	1.002
Service Innovation (X2)	.998	1.002

Note that based on Table 4.5, it is known that the VIF value of self service technology is 1.002, while the maximum value of service innovation is 1.002. Because all VIF values < 10 , it is concluded that there is no multicollinearity.

4.3.3 Heteroscedasticity Test

Detection of the presence or absence of heteroscedasticity can be done by looking at the presence or absence of certain patterns on the scatter plot graph between SRESID on the Y axis, and ZPRED on the X axis (Ghozali, 2013). Ghozali (2013) states that the basis of the analysis is that if there is a certain pattern, such as the points that form a certain regular pattern, it indicates that heteroscedasticity has occurred. If there is no clear pattern, and the points spread above and below the number 0 on the Y axis, then there is no heteroscedasticity.

4.4 Hypothesis Test

4.4.1 Simultaneous Significance Test (F Test)

The F test aims to test the effect of the independent variables together or simultaneously on the dependent variable e-satisfaction.

Table 4.6 Simultaneous Effect Test (F Test)

ANOVA^b

Model	Sum of Squares	Df	Mean Square	F	Sig.
1 Regression	5.493	2	2,746	17,482	.000 ^a
Residual	15,239	97	.157		
Total	20.732	99			

a. Predictors: (Constant), Service Innovation(X2), *Self Service Technology* (X1)

b. Dependent Variable: E-Satisfaction (Y)

Based on Table 4.6, it is known that the calculated F value is 18.966 and the Sig value. is 0.000. It is known that the calculated F value is 17,482 > F table 3,09 and the Sig value is 0.000 < 0,05, then self service technology and service innovation together or simultaneously have a significant effect on e-satisfaction.

4.4.2 Test of Partial Significance (t Test)

Statistical t test was used to determine the level of significance of the effect of each independent variable on the dependent variable. Table 4.7 presents the value of the regression coefficient, as well as the value of the t statistic for partial effect testing.

Table 4.7 Test of Significance of Partial Influence (Test t)

Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
1 (Constant)	2008	.311		6.459	.000		
Self Service (X1)	.200	.057	.308	3537	.001	.998	1.002
Service Innovation (X2)	.293	.060	.427	4.899	.000	.998	1.002

a. Dependent Variable: E-Satisfaction (Y)

Based on the results in Table 4.7, the following regression equation is obtained.

$$Y = 2.008 + 0.200X1 + 0.293X2 + e$$

Based on the results in Table 4.7:

1. Self service technology has a positive effect on e-satisfaction, with a regression coefficient value of 0.200, and significant, with a t-value = 3.537 > 1.98 and a Sig value. = 0.001 < 0.05. So it can be concluded that self service technology has a positive and significant effect on e-satisfaction.
2. Service innovation has a positive effect on e-satisfaction, with a regression coefficient value of 0.293, and is significant, with a t-count value = 4.899 > 1.98 and a Sig value. = 0.000 < 0.05. So it can be concluded that service innovation has a positive and significant effect on e-satisfaction.

4.4.3 Analysis of the Coefficient of Determination

The coefficient of determination (R²) is a value (the value of the proportion) that measures how much the ability of the independent variables used in the regression equation to explain the variation of the dependent variable.

Table 4.8 Coefficient of Determination

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.515 ^a	.265	.250	.39636

a. Predictors: (Constant), Service Innovation(X2), *Self Service Technology*(X1)

b. Dependent Variable: E-Satisfaction (Y)

Based on Table 4.8, it is known that the coefficient of determination (R-Square) is 0.265. This value can be interpreted that the variable of self service technology and service innovation is able to influence e-satisfaction by 26.5%, the remaining 100% - 26.5% = 73.5% is explained by other variables or factors.

5 CONCLUSIONS

Based on the results of the study, it can be concluded that:

1. Self service technology and service innovation are able to influence e-satisfaction by 26.5%, the remaining 100% - 26.5% = 73.5% is explained by other variables or factors.
2. Self service technology and service innovation together or simultaneously have a significant effect on e-satisfaction.

3. Self service technology has a positive effect on e-satisfaction , with a regression coefficient value of 0.200, and significant, with a t-count value = 3.537 > 1.98 and a Sig value. = 0.001 < 0.05. So it can be concluded that self service technology has a positive and significant effect on e-satisfaction.
4. Service innovation has a positive effect on e-satisfaction , with a regression coefficient value of 0.293, and is significant, with a t-count value = 4.899 > 1.98 and a Sig value. = 0.000 < 0.05. So it can be concluded that service innovation has a positive and significant effect on e-satisfaction.

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