The Role of digitalization in Moderating the Influence of Self-Service Technology on Customer Satisfaction at Bank Sumut Syariah Branch Tebing Tinggi

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Abstract

The purpose of this study is to determine how self-service technology services at Bank The purpose of this study is to determine how self-service technology services at Bank Sumut Syariah Tebing Tinggi Branch affect customer satisfaction, influenced by digitization as a moderating variable. This study is quantitative in nature. Customers of Bank Sumut Syariah Tebing Tinggi Branch were involved in this study. The sample size was 100 individuals, selected using the Slovin formula for random sampling. Data quality, classical assumptions, moderation regression, model fit (R^2), hypotheses, and the coefficient of determination are some of the methods used in data processing and analysis in this study. The results of this study indicate that digitalization positively influences self-service technology on the customer satisfaction variable.

Keywords: self service technology, customer satisfaction, digitalization, Bank

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INTRODUCTION

Islamic banks are financial institutions whose role is as a liaison institution that connects people who have excess funds with those who need funds. Islamic banks are one of the concrete proofs of the implementation of Islamic teachings in the field of economics, which in practice are in accordance with the principles of Islamic economics (Tuti Anggraini, 2021). Along with the development of the banking industry, especially Islamic banking today, not only does it experience challenges such as competition between banks, it must also face the flow of digitalization. With digitalization, banking institutions must provide flexible services while protecting customers. In the banking sector, customers have used types of services, such as ATMs and mobile banking, among others. Thanks to technology and information, banks can easily secure and retrieve customer data. This helps them maintain good relationships with customers, handle complaints, and adjust the types of products that customers need.

To support digital transformation in the banking sector, the Financial Services Authority (OJK) issued OJK Regulation No.12/POJK.03/2018 concerning the Implementation of Digital Banking Services by Commercial Banks. The regulation states that "digital banking services include electronic banking that is enhanced by maximizing customer data in order to provide responsive and easily understood services, in line with what customers need. The banking sector is currently competing

to innovate technology in every service to customers. They strive to provide convenience and the best service experience. In the business world, especially in the service sector, the demand for customer satisfaction is very important. The level of customer satisfaction is proportional to the quality of service. Currently, SST (Self Service Technology) has been widely utilized by every member of society in conducting financial transactions in the Islamic financial industry, due to adequate facilities and extensive networks, as well as the widespread use of smartphones throughout society. Therefore, a poor understanding of Islamic financial products and services can affect consumer interest and participation in using these services.

Bank Sumut Digital Service Disruption Causes Customer Disappointment, reported by DR Berita.id " *Seriously, Customers Disappointed Bank Sumut's Online System is Inactive Approaching the End of the Year* " (Artam , Monday, December 30, 2024 19:28 WIB) The Bank Sumut online system that is inactive is ATM and Mobile Banking. Reported by Nawasenanews.com "Even though their balances have been deducted, several customers of Bank Sumut Pematang Siantar Branch failed to transfer funds via ATM. One customer expressed disappointment because the funds transferred had not yet entered the family in great need, especially ahead of the Eid holiday. The bank acknowledged the system problem, saying that the funds would be returned within one twenty-four hours to a maximum of twelve working days (April 5, 2024).

From the news it shows that, although banking digitalization offers convenience and efficiency, customer dissatisfaction can be caused by technical issues that disrupt digital services. Therefore, it is very important to examine how digitalization plays a role in moderating the influence of SST on customer satisfaction, especially at Bank Sumut Syariah Tebing Tinggi Branch. From the existing infrastructure, have they provided maximum service to customers from this phenomenon, do customers still feel the maximum self-service technology service, therefore the researcher wants to further examine how self-service technology impacts customer satisfaction who use self-service services with digital marketing as a moderating variable. Of course, this is a phenomenon that must be studied, whether banking customers will continue to use SST services with self-service technology provided by Bank Sumut Syariah Tebing Tinggi branch.
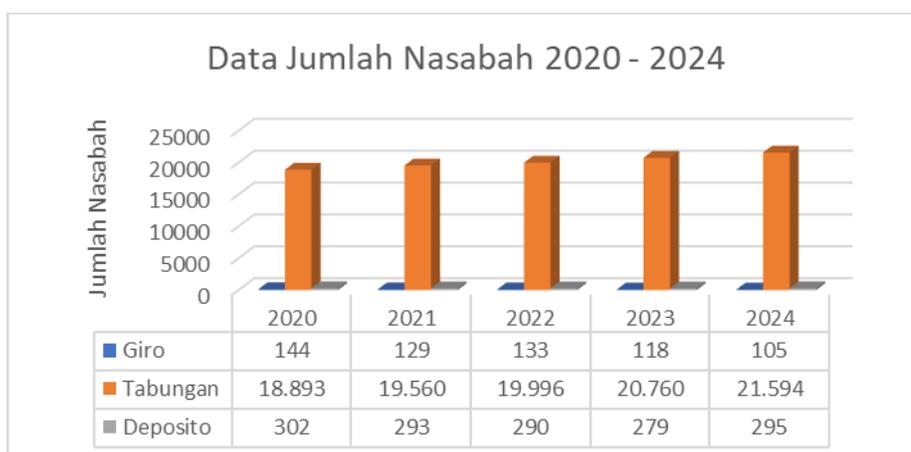
Data Jumlah Nasabah 2020 - 2024

Jumlah Nasabah	2020	2021	2022	2023	2024
Giro	144	129	133	118	105
Tabungan	18.893	19.560	19.996	20.760	21.594
Deposito	302	293	290	279	295

Figure 1. Number of DPK Customers

Source: Bank Sumut Syariah Tebing Tinggi

The figure above shows the number of Bank Sumut Syariah Customers in the last 5 years. Although overall DPK has increased, there are differences in several types of DPK, especially the decline in Giro and Deposits. Therefore, research is needed on how digitalization contributes to SST moderation towards customer satisfaction at Bank Sumut Syariah, Tebing Tinggi branch.

Digitalization of Banking

Digital banking is similar to the term having a bank in your pocket, because everything can be done online without having to go to a branch. One of the advantages of digital banking is that customers do not need to have a bank account to be able to obtain information, make cash deposits, or open accounts. make transactions, and transfer funds. Customers can also access bank products such as checking, investment, and operational banking; they can view related information and make related transactions.

According to Davis (1989), the Technology Acceptance Model (TAM) is a type that is widely used in research on the acceptance of information technology by users. According to research conducted by Setianingrum and Putra (2019), the Theory of Reasoned Action, a social psychology theory, is the basis of the Technology Adoption Model (TAM), which provides a solid framework for identifying elements that influence the adoption of information technology. According to this model, two main constructs, perceived ease of use and perceived usefulness, have the potential to influence how users view technology. The following factors can be used to determine the following factors: (1) ease of learning, (2) ease of operation, (3) clarity and ease of understanding, and (4) ease of becoming skilled (Davis, 1989).

Self Service Technology

Mobile banking is usually based on mobile phones or electronic devices that use self-service technology (SST), such as online systems, which allow customers to make transactions or services independently just like bank employees directly (Meuter et al., 2000). Banks apply ATMs (Automatic Teller Machines) to protect and satisfy customers and provide competitive advantages over other banks. Of course, to measure and estimate service quality, methods and systems that meet public service standards, known as the "Servqual" method, are needed (Huggest 1994). By using this questionnaire, we can determine how big the gap is between customer perceptions and their expectations of a service company.

Servqual is based on the comparison of two main components: customers' views of the actual service provided by the service provider to them. The fact that the service is more than expected by the customer indicates that the service is of quality. Conversely, if the reality is less than desired by the customer, the service is considered to be of poor quality (Pasuraman, 1990). There are five methods, according to

The Role of digitalization in Moderating the Influence of Self-Service...

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Parasuraman, Zeithaml, and Berry (Parasuraman, 1990): 1) tangible (physical evidence), 2) reliability (reliability), 3) responsiveness (responsiveness), 4) assurance (confidence), and 5) empathy.

a. Mobile banking

is a banking service where customers can make banking transactions, view account information, and perform various financial activities through mobile devices such as smartphones and tablets. to make various transactions, such as money transfers, bill payments, monitoring accounts, purchasing goods or facilities, and investments, all of which can be done on the Bank's mobile application Banking Services. (Inayah, 2023)

b. Automatic Teller Machine / ATM

Bank customers can withdraw money and check their savings accounts with an electronic device called an Automatic Teller Machine (ATM). (Vyctoria, 2013: 7).

Customer Satisfaction

According to Kotler and Keller (2009), satisfaction is an expression of joy or dissatisfaction that arises from a comparison between the performance or results of a product and service with what is expected. Customers can feel very happy or satisfied when their needs or expectations are met through interactions between the company and the customer, but they feel dissatisfied when performance does not meet expectations. Customers can feel satisfied when their desires are met according to their expectations. "When services are obtained or enjoyed according to expectations, the quality of service is considered good and satisfying". (Novita Sari, M Syahbudi, 2022).

According to Irawan (2008), there are several factors that influence the level of customer satisfaction, including (1) feelings of satisfaction (in the sense of being satisfied with the product and its services), if a service or product is said to be good if the customer is satisfied with the service provided shown by the company. (2) Buying products non-stop, which means that customers will not stop buying products until they reach their goals. (3) Giving recommendations to others, which means that customers who are satisfied with a product or service will tell others about it and may also recommend the company to others. (4) Meeting customer expectations after purchasing a product, which means that the quality of the product meets or does not meet customer expectations.

RESEARCH METHODS

This study uses a quantitative approach to determine how digitalization (M) acts as a moderator variable, self-service technology (X) as an independent variable, and customer satisfaction of Bank Sumut Syariah (Y) as a dependent variable. This study was conducted at the Bank Sumut Syariah Tebing Tinggi branch, which has a total population of 21,994. A sample size of 100 respondents was selected using the Slovin

The Role of digitalization in Moderating the Influence of Self-Service...

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formula. Both primary and secondary data sources were used in this study. Questionnaires and documents were collected to obtain research results. Data processing methods used include instrument testing, classical assumption testing, MRA testing, coefficient of determination (R^2) testing, F testing, and t testing. The analysis tool used is SPSS version 27.
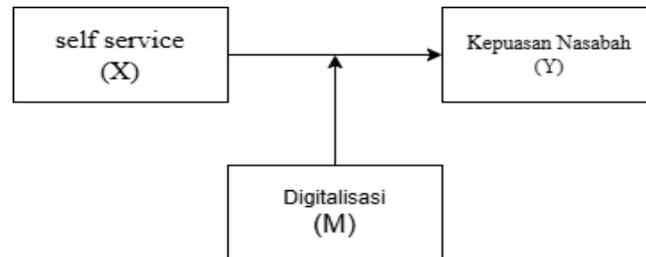

Figure 1. Research Model

RESULTS AND DISCUSSION

Data Quality Test

Table 1 Validity and Reliability Test

Indicator	Sig.(2-tailed)	Information	Cronbach Alpha	Information
	0,000	Valid	0.8 43	**Reliable**
Self Service Technology (X)	0,000	Valid		
	0,000	Valid		
	0,000	Valid		
	0,000	Valid		
	0,000	Valid	0.8 93	**Reliable**
	0,000	Valid		
Customer Satisfaction (Y)	0,000	Valid		
	0,000	Valid	0 ,870	**Reliable**
Digitalization (M)	0,000	Valid		
	0,000	Valid		
	0,000	Valid		

From table 1 As can be seen, all indicators of significance are less than 0.05 (<0.05) based on data quality test and convergent validity test. This indicates that the claim of the research instrument is reliable and applicable, and the Cronbach Alpha value in the reliability test is greater than 0.60 (>0.60) indicates strong convergent validity. Based on the discriminant validity test, the statistical value of each construct is higher than the correlation between the constructs, indicating good validity.

Classical Assumption Test

Regression analysis should begin with classical assumption tests to ensure that the sample data being analyzed accurately represent the population as a whole. This includes the following tests for heteroscedasticity, normality, and multicollinearity:

Table 2 Normality Test

	Unstandardized Residual	**Information**
N	100	
Kolmogorov Smirnov Z	0.54	**Normally Distributed**
Asymp. Sig. (2-tailed)	0.200	

From table 2 If the Asymp.Sig (2-tailed) value is greater than 0.05 (>0.05), then it is said to have a normal distribution. Table 2 shows that the Asymp.Sig (2-tailed) value of the tested equation model is 0.200 which is greater than 0.05. This indicates that the data used in this study has a normal distribution.

Table 3 Multicollinearity Test

Variables	Collinearity Statistics		Information
	Tolerance	VIF	
SST	0.343	2,919	Free from Multicollinearity
Digitalization	0.343	2,919	Free from Multicollinearity

From table 3 SPSS test results show that there is no correlation between independent variables in the regression model. Each independent variable has a tolerance value greater than 0.1 (> 0.1) and a VIF value less than 10 (< 10). Thus, it can be said that multicollinearity does not exist in this regression model.

Table 4 Heteroscedasticity Test

Variables	Sig.	Information

SST	0.665	No Heteroscedasticity Occurs
Digitalization	0.128	No Heteroscedasticity Occurs

Source: Data processed 2025

From table 4, it can be seen that the level of significance (>0.05) exceeds the level of confidence. Therefore, it can be concluded that the regression model does not show any signs of heteroscedasticity.

MODERED REGRESSION ANALYSIS (MRA) TEST
Table 5 First Equation Test

Model	Coefficient	t-count	Sig.
SST	0.865	17,087	**0,000**
F count		**291,974**	**0,000**
R Square			**0.749**

Source: Data processed 2025

From table 5, Based on the significance value of the SST variable of 0.000 (<0.05), it can be concluded that the SST variable significantly affects the Customer Satisfaction variable. The SST variable contributes 74.9% to the Customer Satisfaction variable, while the remaining other variables not examined in this study affect 25.1%, based on the R Square value of 0.749.

Table 6 Second equation test

Model	Coefficient	t-count	Sig.
SST	0.226	1,723	**0.088**
SST*Digitalization	0.680	5.185	**0,000**
F count		197,989	**0,000**
R Square			**0.803**

Source: Data processed 2025

From table 6 of the MRA test results obtained, the following equation can be made.

$$Y=\beta 0 + \beta 1\ X + \beta 2\ (\ X \times Z)$$

$$Y=5.012+0.198(X)+0.021(X \times Z)$$

The Role of digitalization in Moderating the Influence of Self-Service...

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It is known that the significance value of the interaction variable between SST and Digitalization is 0.000 (<0.05), so it can be concluded that the Digitalization variable is able to moderate the influence of the SST variable on Customer Satisfaction.

From table 6, the influence of the SST variable on the Customer Satisfaction variable, after the moderator variable (Digitalization), is 80.3%, based on the R Square value of 0.803, this has increased, thus it can be concluded that the influence of the SST variable on the Customer Satisfaction variable is strengthened after the moderator variable (Digitalization).

Table 7 Hypothesis Testing

Model		T	t table	Sig.	Information
1	Partial Test				
	Self Service Technology	17,087	1,984	0,000	**Significantly Influential**
	SST*Digitalization	5,185	1,984	0,000	**Significantly Influential**
	Digitalization	16.193	1,984	0,000	**Significantly Influential**
2	Simultaneous Test	F	F table		
	F-test	291,974	**2.70**	0,000	**Significantly Influential**
	R Square	**0.749**			**74.9% SST, Significant Influence on Customer Satisfaction**

Source: Data processed 2025

Based on Table 7, the H1 test (SST has a significant effect on customer satisfaction), according to the H $_{1\text{ test}}$ of Hypothesis One (H1). The table above shows that the significance value of X1 is 0.000 which is smaller than (<0.05), which indicates that the variable has a positive effect (H1 is accepted). The H2 test (Digitalization has a significant effect and moderates the effect of self-service technology on customer satisfaction) is part of Hypothesis 2 (H2). This indicates that digitalization significantly moderates the effect of self-service technology on customer satisfaction. Table 7 shows that the significance value of X*M is 0.000 (<0.05), which indicates that the variable has a positive effect (H2 is accepted). The H3 test (digitalization has a positive and significant impact on customer satisfaction), according to the H3 test of Hypothesis Three (H3). The table above shows that the significance value of M1 is 0.000 which is

The Role of digitalization in Moderating the Influence of Self-Service...

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lower than 0.05 (<0.05), indicating that the variable has a positive effect (H3 is accepted).

The calculated F value of 291.974 and the significance level of F of 0.000, which is lower than the value of $\alpha = 0.05$, indicate that the moderate regression analysis (MRA) model is the right analysis tool for this study. With the R Square (R2) coefficient of 0.749 (74.9%), it can be concluded that the impact of self-service technology on customer satisfaction is 0.749 (74.9%). Other variables not related to the independent variables account for 25.1% of the total.

DETERMINATION COEFFICIENT TEST (R2)

From table 8, Considering the coefficient value of R Square (R2) of 0.749 (74.9%), we can say that the major influence of Self Service Technology (SST) on customer satisfaction is 0.749, or 74.9%. Other variables besides the independent variables contribute 25.1% of the total.

Table 8. Test of Determination Coefficient (R2)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.865	0.749	0.746	1.70976

Source: Data processed 2025

DISCUSSION

According to the analysis results, the SST variable has a significant impact on customer satisfaction at Bank Sumut Syariah Tebing Tinggi Branch. The sig value of this variable is 0.000, which means it is less than 0.05 (<0.05). In other words, the level of customer satisfaction increases with Self Service Technology services at Bank Sumut Syariah Tebing Tinggi Branch. The magnitude of the influence of SST before and after digitalization moderation is also shown by the results of the regression test: The R Square value before entering the moderation variable (Digitization) is 0.749, which indicates that Self Service Technology can provide 74.9% in customer satisfaction. The R Square value increased to 0.803 or 80.3%, after the Digitalization variable as a moderating variable. With an increase in the R Square value of 5.4% from 74.9% to 80.3%, digitalization increases the influence of SST on customer satisfaction at Bank Sumut Syariah Tebing Tinggi Branch. In other words, the higher the digitalization owned by the bank (such as ease of access, system security, use of responsive applications, and integration of digital services), the greater the impact of SST on customer satisfaction in using the services, the greater the impact of customer satisfaction in using the self-service services provided.

The role of digitalization as a moderation shows that it not only has a direct influence on customer satisfaction, but also strengthens the relationship between SST and customer satisfaction. This shows that customers who are accustomed and

The Role of digitalization in Moderating the Influence of Self-Service...

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comfortable with digitalization will feel more benefits from the available SST. For Bank Sumut, Tebing Tinggi Syariah Branch, effective implementation of digitalization enables better SST services and fulfills customer desires more efficiently.

Therefore, the findings of this study are in line with previous studies (Siti Fatimah, ema 2024). Students at the Faculty of Islamic Economics and Business UIN Alauddin Makassar believe that the use of self-service technology to save at BSI will have a positive impact because this technology can make it easier for students to transact at BSI. This study shows Bank Sumut management that investment in self-service technology alone is not enough. It must be balanced with improving the quality of digitalization, such as ease of use, customer training, and improving digital features. The level of customer satisfaction can be significantly increased if both parties go hand in hand and work together, so that customer satisfaction continues to increase with the self-service technology provided.

CONCLUSION

The results of the study indicate that (1) SST has an impact on customer satisfaction, with a significance value of X1 of 0.000 (<0.05), which indicates that the variable has a positive effect (H1 is accepted). (2) The significance value of X*M of 0.000, which is smaller than 0.05 (<0.05), indicates that digitalization significantly moderates the effect of Self Service on customer satisfaction. This shows that people who have smartphones can access self-service technology such as Mobile Banking. With a sig value of M1 of 0.000, which is smaller than 0.05 (<0.05), digitalization has shown a positive effect on customer satisfaction. This shows that digitalization via mobile phones can make it easier for customers to make transactions at Bank Sumut, Tebing Tinggi Syariah Branch.

SST has a significant effect on customer satisfaction of Bank Sumut Syariah Tebing Tinggi. The effect of SST on customer satisfaction is strengthened by digitalization as a moderating variable. The effect of SST on customer satisfaction of Bank Sumut Syariah Tebing Tinggi Branch increases along with the level of digitalization applied.

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