Banking Digitalization Through Self-Service Technology toward Customer Behavior at Bank Syariah Indonesia (BSI) Yogyakarta City

Ahmad Fadhil Imran1*, Basri Bado2, Ismi Solikhatun3
1 Department of Islamic Economics, STAI DDI Pangkep
2 Faculty of Economics, Makassar State University
3 SMA Pradita Dirgantara
*Email correspondence: ahmadfadhil0346@gmail.com

Abstract
Banking sector digitization has gained significant attention towards addressing the challenges of an advancing era. Self-Service Technology, as a form of digitalization, empowers public access to banking services is an aspect that needs to be explored. This research employs a quantitative approach with a descriptive method. The population of this study are all customers registered in Bank Syariah Indonesia (BSI) in the city of Yogyakarta. Purposive Sampling is used as a sampling technique. There are 141 BSI users in Yogyakarta who use BSI. The results indicate that there is a positive influence of ATM on Customer Behavior, a positive influence of Mobile Banking on Customer Behavior, and a negative influence of Internet Banking on Customer Behavior. The research also demonstrates that the impact of Self-Service Technology (SST), as observed through the variables of ATM, Mobile Banking, and Internet Banking, collectively affects the variable of Customer Behavior. These findings suggest that the banking digitalization through self-service technology indeed influences customer behavior in decision-making at Bank Syariah Indonesia (BSI) in Yogyakarta. The extent of self-service technology offered has a proportional impact on customer behavior.

Keywords: Banking Digitization, Self-Service Technology, Customer Behaviour, Bank Syariah Indonesia

INTRODUCTION

In advanced technology era, human activities are directed towards adapting to digital sophistication, especially in facing the crises caused by the COVID-19 pandemic. All sectors of the economy eagerly welcome these innovations in the hope of facilitating...
and accelerating economic turnover, one of which is the banking sector. Digitization gain lot of attention as a strategic step in driving economic recovery amidst the crisis and meeting the challenges of an advancing era. This is further emphasized by the increasing strength of supply and demand, which requires the banking sector to strive to meet customer needs more quickly (Eriksson et al., 2020). Additionally, competitive pressure is also a driving factor for banking companies to promptly undergo digital transformation (Forcadell et al., 2020). In line with what was presented by Zouari & Abdelhedi (2021), it is emphasized that the banking industry is needed to promptly integrate its services with digital technology in response to market changes and customer needs.

Given the rapid pace of technology and information within the Indonesian community, banking companies must step in to navigate the changes. Indonesians mostly prefer things that are instant, require minimal time, and are accompanied by quick, affordable, and reliable services (Mustika & Puspita, 2021). However, many customers consider the risk factors associated with the presence of digital banking. Among these customers, there is a significant concern about unscrupulous individuals who frequently misuse customer privacy. Customer distrust can undoubtably lead to anxiety when using mobile banking, potentially resulting in losses for the company (Bada & Karupiah, 2021; Huang et al., 2021; Suarka & Setena, 2021). Therefore, it is crucial to ensure the highest level of security and, ideally, establish regulations as an effort to protect customers (Valverde & Fernandez, 2020).

An important element in the banking industry is trust. Once trust is established, customers will remain committed to doing business with the provider of goods and services for an extended period of time (Wahyoedi & Winoto, 2018). Gaining trust from a banking customer also requires attention to several aspects, including cognitive, emotional, and behavioral dimensions of the customer (Punyatoya, 2019). In the banking sector, it is important to pay attention to customer behavior during providing service facilities. Specifically, according to Zouari & Abdelhedi (2021), Islamic bank managers need to understand the criteria that customers use to evaluate the system and form of banking services in line with the changing of consumer behavior patterns due to the current digital trend. This effort is necessary given that traditional banks have also kept their customer information for themselves without showing all the market options they have (Svatoš, 2021). A study conducted by Rossanty et al. (2018) on consumer behavior towards companies emphasized that service and product companies should pay attention to customer needs, behavior, decisions, and post-use of services and facilities from the company. All of these aspects must be evaluated for the sustainability and continuity of banking.

Based on those phenomena, banking institutions are required to seek new strategies in attracting customers in order to retain the use of banking facilities (Wandira et al., 2022). The availability of new facilities that facilitate the use of technology and information accessibility should rightfully be offered to the public to maintain the comfort and trust of customers in online transactions (Febrian et al., 2021; Siska, 2022). Hence, other benefits can also be obtained by banking companies because by adopting technology through digitization, they can expand the bank's market without the need for additional branch openings, and this is expected to minimize costs (Alisjahbana et al., 2020). According to Ginantra et al. (2020), banking digitization is a manifestation of digital innovation development in banking services to facilitate consumers in obtaining information, conducting banking transactions such as account opening and closing registration, as well as fund transfers and e-commerce transactions.

In order to facilitating consumers in every transaction, several studies also indicate interesting facts related to banking digitization, where there is an influence of banking digitization on trust (Marwanah, 2021; Ubaidillah et al., 2021), as well as on consumer behavior (Dehnert & Schumann, 2022; Poustchi & Dehnert, 2018). However, specifically in Islamic banking, in this case, Bank Syariah Indonesia, it is not deeply understood. According to Utama (2021), the use of digital Islamic banking in Indonesia is not yet optimal. The low level of inclusiveness of sharia finance in Indonesia compared to conventional finance indicates that many Indonesians still prefer to access conventional banking services (Sukmawati et al., 2021). This can be seen from the level of utilization and sustainable use of Islamic mobile banking, which still faces many limitations and challenges.

On a broader scale, Islamic banking also seems to have difficulty moving away from the traditional system, so the products and services tend to reflect less
of digital transformation (Zouari & Abdelhedi, 2021). Therefore, this study seeks to further investigate how the influence of banking digitization through self-service technology (SST) affects customer behavior in decision-making at Bank Syariah Indonesia (BSI) in Yogyakarta City.

This research was conducted in Yogyakarta because the potential for customers to use Bank Syariah Indonesia is quite large as a city of Education and Culture, with a Muslim population of 92% of the total population of Yogyakarta (Kristanto, 2022).

2. RESEARCH METHODS

This type of research is a case study using a quantitative approach, which aims to obtain objective data involving the collection and analysis of quantitative data, and employs statistical testing methods (Sugiyono, 2019). This quantitative research utilizes a descriptive method to describe the gathered data with the aim of understanding the influence of banking digitization through self-service technology (SST) consisting of ATM ($X_1$), Mobile Banking ($X_2$), and Internet Banking ($X_3$) as independent variables, with customer behavior ($Y$) as the dependent variable.

The population under study comprises all registered customers of Bank Syariah Indonesia (BSI) in the city of Yogyakarta. The sampling technique employed in this research is non-probability sampling, specifically purposive sampling, which involves selecting respondents based on specific considerations. In this case, the respondents are individuals who are registered as users of Bank Syariah Indonesia (BSI) in Yogyakarta and actively conduct transactions through ATM, mobile banking, and internet banking at Bank Syariah Indonesia (BSI) in the city of Yogyakarta. Since the population size is unknown, the sample size is determined using an unknown population approach. The total number of respondents in this study is 141 BSI users in Yogyakarta.

3. RESULTS AND DISCUSSION

3.1. Research Results

3.1.1. Classic assumption test

Classical assumption tests are conducted as prerequisites before hypothesis testing. These tests include normality test, multicollinearity test, heteroskedasticity test, and autocorrelation test.

3.1.1.1. Normality test

The normality test in table 1 is performed to determine whether the distribution of data in a variable group follows a normal distribution or not. The result of the normality test shows a significance value of 0.200 (>0.05), indicating that the collected data has a normal distribution.

```
Table 1. Normality test results

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Unstandardized Residual</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>141</td>
</tr>
<tr>
<td>Normal Mean</td>
<td>.0000000</td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>2.9598497</td>
</tr>
<tr>
<td>Most Extreme Absolute</td>
<td>.062</td>
</tr>
<tr>
<td>Differences Positive</td>
<td>.061</td>
</tr>
<tr>
<td>Negative</td>
<td>- .062</td>
</tr>
<tr>
<td>Test Statistic</td>
<td>.062</td>
</tr>
<tr>
<td>Asymp. Sig. (2-tailed)</td>
<td>.200^d</td>
</tr>
</tbody>
</table>

Source: data processed via SPSS, 2023
```

The normality test in table 1 is performed to determine whether the distribution of data in a variable group follows a normal distribution or not. The result of the normality test shows a significance value of 0.200 (>0.05), indicating that the collected data has a normal distribution.

3.1.1.2. Multicollinearity test

```
Table 2. Multicollinearity Test Result

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>Collinearity Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
</tr>
<tr>
<td>1 (Constant)</td>
<td>4.561</td>
<td>3.108</td>
<td>-</td>
</tr>
<tr>
<td>ATM</td>
<td>.507</td>
<td>.078</td>
<td>.428</td>
</tr>
<tr>
<td>Mobile_Banking</td>
<td>.437</td>
<td>.074</td>
<td>.390</td>
</tr>
<tr>
<td>Internet_Banking</td>
<td>-.084</td>
<td>.040</td>
<td>-.126</td>
</tr>
</tbody>
</table>

Source: data processed via SPSS, 2023
```
The multicollinearity test in table 2 is used to assess the independent variables. The results of the multicollinearity test indicate that the VIF (Variance Inflation Factor) for the ATM variable is 1.244 (<10), for the mobile banking variable is 1.232 (<10), and for the internet banking variable is 1.019 (<10). This suggests that there is no multicollinearity or no significant relationship among the independent variables.

3.1.1.3. Heteroscedasticity test

Heteroscedasticity test in figure 1 indicates whether there is inequality in the variance of residuals from one observation to another in a regression model. The results of this heteroscedasticity test are that there is no specific pattern and the points spread above and below zero on the Y axis, suggesting that both of these variables demonstrate no signs of heteroskedasticity.

3.1.2. Hypothesis test

3.1.2.1. T-test

The t-test is used to determine the significance of the variable, and the results obtained from the regression can be explained by the relationship. The results of the t-test in this research are shown in the following table:

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>1 (Constant)</td>
<td>4.561</td>
<td>3.108</td>
<td>1.467</td>
<td>.145</td>
</tr>
<tr>
<td>ATM</td>
<td>.507</td>
<td>.078</td>
<td>.428</td>
<td>6.477 .000</td>
</tr>
<tr>
<td>Mobile_Banking</td>
<td>.437</td>
<td>.074</td>
<td>.390</td>
<td>5.937 .000</td>
</tr>
<tr>
<td>Internet_Banking</td>
<td>-.084</td>
<td>.040</td>
<td>-.126</td>
<td>-2.114 .036</td>
</tr>
</tbody>
</table>

Source: data processed via SPSS, 2023

Table 3 presents the results of the T-test. In H1, it shows the value of Sig. for the effect of X1 on Y is worth 0.000 <0.05 and the t_count value is 6.477 > t_table 1.977, so it can be concluded that H1 is accepted which means there is a positive influence X1 on Y. The test results on H2 show the value of Sig. for the effect of X2 on Y is worth 0.000 <0.05 and the t_count value is 5.937 > t_table 1.977, so it can be concluded that H2 is accepted which means there is a positive influence X2 on Y. The results of the T test on H3 show the value of Sig. for the effect of X3 on Y is worth 0.03 <0.05 and the t_count is -2.114 <t_table 1.977, so it can be concluded that H3 is accepted which means there is a negative effect of X3 on Y.

3.1.2.2. F-test

The F-test is used to test the assumption about the appropriateness of the regression model applied to empirical data or observational results. The F-test is used to determine whether all independent variables collectively have an effect on the dependent variable. The results of the F-test are shown below.

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>1324.070</td>
<td>3</td>
<td>441.357</td>
<td>49.300</td>
<td>.000</td>
</tr>
<tr>
<td>Residual</td>
<td>1226.497</td>
<td>137</td>
<td>8.953</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>2550.567</td>
<td>140</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: data processed via SPSS, 2023
Table 4 presents the results of the F-test which shows that the significance value for the effect of $X_1$, $X_2$, and $X_3$ simultaneously on $Y$ is 0.000 <0.05 and the $F_{(2,27)}$ value is 49.300 >2.67, so it can be concluded that $H_0$ is accepted which means there is an influence of $X_1$, $X_2$, and $X_3$ simultaneously to $Y$.

3.2.1.3. $R^2$-test (Coefficient of Determination)

**Table 5. Test results for the coefficient of determination**

<table>
<thead>
<tr>
<th>Mode</th>
<th>$R^2$</th>
<th>Adjusted $R^2$</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.721</td>
<td>.519</td>
<td>2.99208</td>
</tr>
</tbody>
</table>

Source: data processed via SPSS, 2023

Table 5 presents the results of the $R^2$ test which was conducted to measure how far the model's ability to explain variations in the dependent variable. The results of the $R^2$ test show that the value of $R$ Square is 0.519, this means that the influence of variables $X_1$, $X_2$, and $X_3$ simultaneously on variable $Y$ is 51.9%.

3.2. Discussion

Digitization and technological evolution have increased the use of wireless devices, especially post the COVID-19 pandemic (Akram et al., 2021). The rapid technological advancement has led to changes in customer behavior patterns. Solomon et al. (2013) state that customer behavior in decision-making is the processes that occur when individuals or groups choose, use, or discontinue the use of products and services that they expect to satisfy specific needs and desires. With digitization, consumers tend to prefer shopping to meet their needs through online platforms that are safer, easier, and more convenient to use (Akram et al., 2021).

Technology brings about significant transformations, resulting in new products and services for both personal and professional needs, as well as enhancing interactions between machines and humans (Sima et al., 2020). One form of technological advancement is the increasing digitization in human activities, including in banking. Digitization in banking encompasses electronic banking, online banking, and internet banking (Alkhwaiter, 2020). This facilitates users in conducting various financial transactions more quickly, easily, and securely. Banking digitization is continuously progressing over time. The rapid pace of digitization, especially in the banking sector, is driven by customer satisfaction through various banking services offered (Jünger & Mietzner, 2020).

Banking digitization is not only limited to conventional banks but also applies to Islamic banks. Indonesia, with the largest population of Muslims, presents unique opportunities for the development of Islamic banking. In this study, the Shariah bank is Bank BSI. Digitization transforms banking activities, allowing them to be conducted anywhere and anytime (Joshi & Parihar, 2017) and can be done independently. The public's independent access to this technology is referred to as Self-Service Technology. Meuter et al. (2000) define Self-Service Technology as an interface technology that enables customers to generate services independently without the involvement of service personnel. The Self-Service Technology provided by Shariah banks includes ATM (Automatic Teller Machine), internet banking, and mobile banking.

The results of the first study show that there is a positive influence of ATM ($X_1$) on Customer Behavior ($Y$). The positive influence shows that improving the quality and features of the ATM can improve customer behavior using Bank BSI. The results of this study are in line with research conducted by Khawaja & Manarvi (2009), namely an increase in the number of ATMs will increase consumer convenience in using ATM technology and ultimately increase customer behavior. Consumers view the use of ATMs as part of the Self-Service Technology at BSI Bank as facilitating cash withdrawals, transfers, top-ups, internet payments, insurance, electricity payments, and even registration for BSI Bank's E-channel.

Second, the results of the study show that mobile banking ($X_2$) has a positive effect on customer behavior ($Y$). The positive effect shows that the increasing quality and convenience obtained by customers in accessing mobile banking will increase customer behavior. Customer behavior refers to customer behavior in searching for, buying, using or stopping the use of products and services that are expected to increase customer needs (Schiffman & Wisenblit, 2015). Jamal & Al-Marri (2007) also explained that customer behavior is influenced by the suitability of the customer's self-image with the products and services offered, in this case the suitability of mobile banking features with the needs and self-image of customers.

Third, the results of the study show that there is a negative effect of Internet Banking ($X_3$) on Customer Behavior ($Y$). The results of this study indicate that improving the quality and convenience of internet...
banking does not increase customer behavior. Research conducted by Almohaimmeed (2012) shows that individual acceptance of internet banking is largely determined by their beliefs and attitudes towards the use of this technology and the extent to which the functionality of internet banking websites assists internet banking users in performing their banking services.

Banking digitization poses a challenge to the banking industry, given the numerous financial applications that have emerged, providing users with various advantages such as points and cashback. Banks are required to continue innovating, especially in providing services to the public, one of which is through Self-Service Technology. This research measures Self-Service Technology using variables ATM, Mobile Banking, and Internet Banking. Finally, the results of this study indicate that the effect of Self-Service Technology (SST) as seen from the ATM, Mobile Banking and Internet Banking variables has a simultaneous influence on the Customer Behavior variable. These results are in line with research conducted by Huraniyah (2023) which explains that ATM, Mobile Banking and Internet Banking have a significant influence on customer satisfaction. Research conducted by Rosalia (2022) also concluded that ATM, Mobile Banking and Internet Banking have a significant influence on customer satisfaction in sharia banks. This customer satisfaction will influence the decisions and attitudes of customers in using BSI bank or what is called customer behavior. These results indicate that banking digitization through self-service technology has an impact on customer behavior in decision-making at Bank Syariah Indonesia (BSI) in Yogyakarta City. BSI Bank customers base their actions, attitudes, and decisions in using BSI Bank on digitization through Self-Service Technology (SST). The greater the self-service technology offered, the more it will influence customer behavior.

4. CONCLUSION

Indonesia, with its substantial Muslim population, presents distinct opportunities for the advancement of Sharia banking. The ongoing digitization of banking poses a challenge to the industry, given the proliferation of financial applications that have streamlined user experience, along with various perks like rewards and cash back. The banking sector must maintain a commitment to innovation, particularly in catering to the needs of the public, including the implementation of Self-Service Technology.

The study's findings indicate that there is a positive impact of ATM usage on Customer Behavior, as well as a positive influence of Mobile banking on Customer Behavior. Conversely, Internet Banking has a negative effect on Customer Behavior. Additionally, the study shows that the combined influence of Self-Service Technology, as observed through variables such as ATM, Mobile Banking, and Internet Banking, collectively impacts Customer Behavior.

These results underscore the influence of banking digitization through self-service technology on customer behavior in decision-making processes at BSI in Yogyakarta City. This research provides valuable insights for assessing the effectiveness of banking digitization, particularly in enhancing service quality for each BSI customer. This includes actions, attitudes, and decisions closely tied to the utilization of digitalization through Self Service Technology. With the increasing availability of self-service technology, it can significantly shape the behavior of every customer.

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