Falahiya: Research Journal of Islamic Banking and Finance
P-ISSN 2964-9811, E-ISSN 2964-8130
Volume 5 Issue 1, January - June 2026
https://ejournal.iainponorogo.ac.id/index.php/falahiya

THE INFLUENCE OF SECURITY AND CONVENIENCE ON *BYOND BY* BSI USER LOYALTY WITH SATISFACTION AS A MEDIATING VARIABLE

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Article Info

Article history:
Received May 7, 2026
Revised May 30, 2026
Accepted June 14, 2026

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Keywords:
Security, Ease of Use, Customer Satisfaction, Loyalty, Islamic Bank

Abstract

Introduction: This study examines the effects of security and ease of use on user loyalty toward the BYOND by BSI application, with customer satisfaction as a mediating variable. The study aims to analyze both the direct and indirect effects of security and ease of use on user loyalty. **Research Methods:** A quantitative approach was employed involving 100 active *BYOND by* BSI users at BSI KCP Ponorogo. Data were collected through questionnaires using purposive sampling and analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM). **Results:** The results show that security, ease of use, and customer satisfaction have positive and significant effects on user loyalty. Security and ease of use also positively and significantly influence customer satisfaction. Furthermore, customer satisfaction significantly mediates the effects of security and ease of use on user loyalty. **Conclusion:** Security and ease of use are important factors in enhancing user loyalty, both directly and through customer satisfaction. These findings suggest that improving system security and application usability can strengthen customer satisfaction and foster long-term loyalty in digital banking services.

DOI: https://doi.org/10.21154/a5vm7524
Page: 121-130

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INTRODUCTION

Loyalty is defined as a consumer's commitment to continually repurchase a service or product on a regular basis, where this commitment remains strong despite temptations or factors that could change their purchasing behavior (Adam, 2015). Customer loyalty represents a customer's consistency in repeating transactions for a company's products or services, as well as maintaining their steadfastness in not switching to competitors (Griffin, 2005). According to Oliver, loyalty is defined as consistent repeat purchases based on a deep commitment. This creates a stable pattern of purchasing behavior, where consumers are not easily influenced by competitors' marketing appeals or other external factors. This concept shows that loyalty has a strong psychological dimension, where customers have an emotional attachment to the service provider (Oliver, 1999).

According to Ribbink et al., there are five main factors that play a role in customer loyalty, namely trust, satisfaction, perceived value, security, and convenience (Ribbink, 2004). Researchers chose the security variable because, theoretically, security serves as a deterrent to transaction risks (Casaló et al., 2007). The second variable is convenience, as ease of use plays a role in accelerating technology adoption (Davis, 1989). The synergy of these two aspects will create customer satisfaction, which, according to Ribbink et al., is the main foundation for maintaining customer retention and dominating the digital banking market (Ribbink, 2004).

The synergy between these three variables confirms that customer loyalty is the result of a gradual evaluation process of system security and operational ease, which collectively builds user satisfaction (Amin, 2016). As emphasized in research by Novia et al., digital service quality plays a crucial role in building sustainable user loyalty (Novia & dkk, 2023). However, this is contradicted by Zakiya's findings, which reveal that feature satisfaction alone is insufficient, as customers are still susceptible to switching platforms if competing banks offer greater incentives (Zakiya, 2023). Other research shows that loyalty is indirectly influenced by service quality through satisfaction, so satisfaction plays an important but not always the sole determining factor in customer loyalty (Triyanti et al., 2021).

When conducting transactions, security is the most important and crucial aspect of any information technology system. Security in digital banking services can be measured through confidentiality, integrity, availability, and authentication (Hartono, 2018) Information security theory also emphasizes data confidentiality, integrity, and availability (Jogiyanto, 1990). Research by Salisbury et al. shows that confidence in system security can increase transaction intention and customer loyalty (Salisbury, 2001). Conversely, Kirlappos, Beautement, and Sasse state that overly stringent technical protection can actually be a barrier to users (Kirlappos et al., 2013).

Ease of use is a critical factor in the adoption of digital applications. According to Venkatesh and Davis, ease of use relates to the belief that a system can be used without excessive effort (Venkatesh & Davis, 2000). Within the Technology Acceptance Model (TAM) framework, ease of use occurs when users believe the system can be operated practically and efficiently (Davis, 1989). Davis argues that user-friendly systems will increase user adoption

and loyalty (Davis, 1989). However, Gefen and Straub found that ease of use alone is not enough to retain customers without a sense of security (Gefen & Straub, 2000). Furthermore, Zeithaml, Parasuraman, and Malhotra explain that users may switch to another platform if the underlying service quality is inadequate (Zeithaml, 2000).

Customer satisfaction acts as a mediating variable that bridges the relationship between security and convenience and loyalty. Satisfaction transforms users' cognitive evaluations of service quality into actual loyalty behavior (Caruana, 2002). Theoretically, satisfaction is a person's feeling of pleasure or disappointment after comparing product performance with their expectations (Kotler & Keller, 2016). Mowen and Minor define satisfaction as the overall attitude expressed by users toward goods or services they have used (Mowen & Minor, 2002). Anderson and Srinivasan state that satisfaction is the key bridge that transforms service experience into long-term loyalty (Anderson & Srinivasan, 2003). However, Reichheld points out the satisfaction paradox, namely that satisfied customers still have the potential to switch to another provider if they receive a more attractive offer.

RESEARCH METHOD

A. Research Design

This research uses a quantitative approach, a research method based on the positivist paradigm. This approach was chosen because it possesses scientific characteristics that are objective, systematic, measurable, and empirical. Furthermore, quantitative research allows researchers to test theories through numerical data analyzed using statistical techniques (Sugiyono, 2021).

Quantitative methods are used when researchers want to test hypotheses, determine the relationship or influence between variables, and obtain information that can be measured objectively so as to minimize subjectivity in drawing conclusions (Sugiyono, 2021).

B. Research Variables and Operational Definitions

Research variables are anything determined by the researcher to be studied to obtain information that can be used to draw conclusions (Sugiyono, 2021). In this study, there are three types of variables:

1. Independent Variable

An independent variable is a variable that influences or causes changes in another variable (Ulfa, 2021). The independent variables in this study consist of:

a. Security (X1)
b. Convenience (X2)

2. Dependent Variable

The dependent variable is a variable influenced by the independent variable and is usually denoted by the symbol Y (Ulfa, 2021). In this study, customer loyalty is designated as the dependent variable (Y).

3. Mediating Variable (*Intervening Variable*)

A mediating variable is a variable that functions as an intermediary between the independent variable and the dependent variable, so that the resulting influence is indirect (Sugiyono, 2016). In this study, customer satisfaction acts as the mediating variable (Z).

Table 1. Operational Research Variables

Research Variables	Operational Definition	Indicator	Source
Security (X1)	Security is a conscious effort to protect information to prevent damage or misuse by irresponsible parties.	a. *Confidentiality* b. *Integrity* c. *Availability* d. *Authentication*	Hartono M Jogiyanto
Convenience (X2)	Ease is a confidence in the process of making decisions.	a. Time efficiency b. Ability to make transactions c. Ease of operation d. Flexible use	Davis, *"Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology"*
Customer Loyalty (Y)	Customer loyalty is defined as the tendency of consumers to remain loyal to a particular product through regular transactions without being influenced by offers from competing parties.	a. Make repeat purchases regularly b. Purchase between product or service lines c. Recommend the fish to others d. Not easily influenced by competitors from other similar products.	Fandi Tjiptono, "Service Management"
Customer Satisfaction (Z)	Customer satisfaction is the overall attitude shown by consumers, customers or clients towards the products and services they have obtained and used.	a. Product Performance b. Repurchase c. Needs d. Hope	Kotler and Keller

C. Research Location

This research was conducted at Bank Syariah Indonesia (BSI) Ponorogo Branch Office, located at Jalan Soekarno Hatta No. 2B, Bangunsari, Ponorogo District, Ponorogo Regency, East Java. The research location was chosen because it has a large number of *BYOND by* BSI application users and is active in developing digital banking services.

According to Nasution (2003), the research location is a social environment consisting of actors, places, and activities observed by the researcher.

D. Population and Sample

1. Population

A population is a generalized area consisting of objects or subjects with certain characteristics determined by the researcher to be studied and then conclusions drawn(Sugiyono, 2016). The population in this study was all users of the *BYOND by* BSI application at PT Bank Syariah Indonesia. Based on the BSI Annual Report for 2025, the number of *BYOND by* BSI application users reached 5,888,638 users (BSI, 2025).

2. Sample

A sample is a portion of a population that possesses certain characteristics and is considered capable of representing the research population. The sampling technique used is *non-probability sampling* with a *purposive sampling approach* , namely selecting respondents based on certain criteria determined by the researcher.

The respondent criteria in this study are:

a. Active customers of BSI KCP Ponorogo.
b. Using the BYOND by BSI application for at least the last 3 months.
c. Make transactions at least twice in the last month.

The number of samples was determined using the Slovin formula (Prasetyo, 2008):

$$n = N / (1 + Ne^2)$$

With a population of 5,888,638 users and an error rate of 10%, a sample size of 99.99 was obtained, which was then rounded up to 100 respondents. Data collection was carried out using *incidental sampling techniques* , namely determining respondents based on anyone the researcher happened to meet and who met the research criteria (Prasetyo, 2008).

E. Data Types and Sources

This study used quantitative data in the form of primary data obtained directly from respondents through questionnaire distribution (Siregar, 2017). Primary data was chosen because it can provide information that meets the research needs directly from the primary source (Bungin, 2017).

F. Method of collecting data

BYOND by BSI customers. A questionnaire is a data collection technique that involves providing a set of written questions to respondents to answer based on their own circumstances (Herlina, 2019). Questionnaires were distributed in person and through online media such as WhatsApp and Instagram.

G. Research Instruments

A research instrument is a tool used to measure the phenomena observed in a study (Sugiyono, 2021). The instrument used was a questionnaire with a four-level Likert scale: Strongly Agree (SAS), Agree (SAS), Disagree (SAS), and Strongly Disagree (SAS).

Table 2. Likert Scale

Statement	Score Weight
Strongly Agree (SS)	4
Agree (S)	3
Disagree (TS)	2
Strongly Disagree (STS)	1

The use of a four-point Likert scale aims to eliminate neutral options so that respondents can show attitudinal tendencies more clearly (Sugiyono, 2021; Sujalu et al., 2021).

H. Validity and Reliability of Instruments

1. Validity Test

Validity indicates an instrument's ability to measure what it is supposed to measure (Sugiyono, 2013). This study used convergent validity *and* discriminant validity *tests*. The required outer loading value is >0.70, while *the Average Variance Extracted* (AVE) value must be >0.50 (Sarstedt et al., 2021). In addition, discriminant validity was evaluated using *the Heterotrait-Monotrait Ratio* (HTMT) method, with the recommended HTMT value being below 0.85 or a maximum of 0.90 (Henseler et al., 2015).

2. Reliability Test

Reliability indicates the level of consistency of an instrument in producing stable and reliable data (Kusuma, 2023). An instrument is considered reliable if *the Cronbach's Alpha* and *Composite Reliability values* are greater than 0.70 (Hair et al., 2019).

3. Data Processing and Analysis Techniques

Data analysis is the process of grouping, presenting, and processing data to answer the problem formulation and test the research hypothesis (Sugiyono, 2013). This study used descriptive statistical analysis and *Partial Least Squares Structural Analysis. Equation Modeling* (PLS-SEM) with the help of SmartPLS software version 4. The PLS method was chosen because it can analyze relationships between latent variables without requiring a multivariate normal distribution and is more flexible regarding sample size (Ghozali & Latan, 2012). PLS analysis consists of evaluating the measurement model (outer model) and the structural model (inner model) (Rahadi, 2023)

RESULTS AND DISCUSSION

1. *BYOND* User Loyalty by BSI

   Based on the results of the structural model testing using SmartPLS, the security variable was proven to have a positive and significant effect on *BYOND by* BSI user loyalty. This is indicated by a positive path coefficient with a t-statistic greater than 1.96 and a p-value *less* than 0.05. Thus, the hypothesis that security influences user loyalty is accepted.

   The research results show that security is a crucial factor in shaping user loyalty among the *BYOND by* BSI app. The higher the perceived level of security, the higher their loyalty to the app. Security provides customers with confidence that their personal data and transactions are securely protected. These findings align with the relationship marketing theory proposed by Morgan and Hunt (1994), which explains that trust is a key factor in building long-term relationships between companies and customers. These findings also support research by Amalia and Wusko (2025), who found that security has a positive effect on mobile banking user loyalty.

2. The Effect of Convenience on User Loyalty *BYOND by* BSI

   The analysis results show that ease of use has a positive and significant effect on *BYOND by* BSI user loyalty. The path coefficient value indicates a positive relationship with a significance value that meets the hypothesis testing criteria.

   Ease of use is one of the factors that encourages users to continue using the *BYOND by* BSI app. An app that's easy to understand, simple to operate, and able to speed up the transaction process will increase user convenience, thus fostering loyalty. These results align with the Technology Acceptance Model (TAM) developed by Davis (1989), which states that perceived ease of use is a critical factor influencing user acceptance of technology. These findings also support research by Dewi (2023) and Hafizh, Rahma, and Jannah (2023), who found that ease of use positively impacts *mobile banking customer loyalty*.

3. *BYOND by* BSI User Loyalty

   Test results show that customer satisfaction has a positive and significant impact on *BYOND by* BSI user loyalty. Therefore, the higher the level of satisfaction perceived by users, the higher their loyalty to the app.

   The satisfaction felt by users after using the application will encourage them to continue using the same service and recommend it to others. Satisfied users tend to have long-term relationships with service providers. This finding is in accordance with Oliver's (1999) theory which explains that satisfaction is the basis for forming customer loyalty. The results of this study are also in line with the research of Febiola and Fasa (2024) which states that customer satisfaction has a significant influence on the loyalty of *mobile banking service users*.

4. The Effect of Security on User Satisfaction *BYOND by* BSI

   The results of the hypothesis testing show that security has a positive and significant effect on *BYOND by* BSI user satisfaction. Good security provides users with a sense of security when conducting digital transactions. Personal data protection, account

security, and robust authentication systems can enhance the user experience and create satisfaction. These findings support the information systems success model developed by DeLone and McLean (2003), which explains that system quality is a factor influencing user satisfaction. These findings also support research by Amalia and Wusko (2025), who found that security has a positive effect on *mobile banking user satisfaction*.

5. *BYOND by* BSI User Satisfaction

BYOND by BSI user satisfaction. Ease of accessing features, understanding app menus, and quickly completing transactions can enhance the user experience. These positive experiences will lead to higher levels of satisfaction. These findings align with Davis's (1989) TAM theory, which states that ease of use plays a crucial role in shaping positive perceptions of technology. These findings also support Sari and Oswari's (2023) study, which found that ease of use significantly influences user satisfaction with digital services.

6. The Influence of Security on Loyalty through User Satisfaction

The results of the mediation test indicate that satisfaction mediates the influence of security on *BYOND by* BSI user loyalty. This is evidenced by the significant *indirect effect value.*

Table 3. Results of Indirect Influence

		Original sample (O)	Sample Mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV)	P value
Security -> Satisfaction -> Loyalty		0.161	0.160	0.056	2,853	0.004
Convenience -> Satisfaction -> Loyalty		0.149	0.150	0.057	2,641	0.008

Source: Primary data processed in 2026

Variables

Security → Satisfaction → Loyalty

These results indicate that security not only directly impacts loyalty but also through increased user satisfaction. When users feel secure in their transactions, they are more satisfied and ultimately become more loyal to the app. Research which explains that satisfaction acts as a mediator between service quality and customer loyalty (Caruana, 2002).

7. The Influence of Convenience on Loyalty through User Satisfaction

indirect effect test show that satisfaction is able to mediate the influence of convenience on *BYOND by BSI* user loyalty.

Variables

Convenience → Satisfaction → Loyalty

Perceived user ease of use will increase satisfaction, and this satisfaction then drives loyalty. Thus, satisfaction is an important mechanism explaining the relationship

between ease of use and app user loyalty. The results of this study support Davis's theory (1989) and Caruana's research (2002) which states that satisfaction plays a role as a mediating variable in the relationship between service quality and customer loyalty.

CONCLUSION

Based on the research results, the security variable was proven to have a positive and significant influence on *BYOND by* BSI customer loyalty. This indicates that the higher the level of security perceived by users, the higher their loyalty to the service. The convenience variable also has a positive and significant impact on customer loyalty. Ease of use of the application creates a sense of comfort for users, thus increasing loyalty to *BYOND by* BSI services. Customer satisfaction has been shown to have a positive and significant impact on loyalty. This indicates that the higher the level of user satisfaction, the greater their commitment to continuing to use the service in the long term. Besides influencing loyalty, security also has a positive and significant impact on customer satisfaction. This means that a secure system can increase user trust and comfort, which in turn increases satisfaction.

Ease of use also has a positive and significant effect on customer satisfaction. The easier a system is to use, the higher the level of user satisfaction with *BYOND by* BSI services. Security has been shown to have an indirect effect on customer loyalty through satisfaction as a mediating variable. This suggests that good security will initially increase satisfaction, which then drives user loyalty. Convenience also has an indirect impact on customer loyalty through satisfaction. In other words, ease of use increases user satisfaction, which ultimately strengthens customer loyalty to *BYOND by* BSI.

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