



How cybercrime sentiment shapes mobile banking adoption in Islamic banking

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Abstract

Purpose – This study aims to identify the factors influencing the adoption of mobile banking in the context of cybercrime issues in digital banking services by focusing on a case study of Bank Syariah Indonesia (BSI) customers.

Methodology – This study examined five independent variables as mediators: cybercrime issue sentiment, security perceptions, convenience, digital literacy, cybersecurity awareness, and trust. It involves 100 BSI customer respondents and is analyzed using the SEM-PLS method.

Findings – The findings indicate that Cybercrime issue sentiment and perceived security positively impact trust. However, this trust does not influence mobile banking adoption, suggesting that other factors may dominate adoption decision-making. Convenience and cybersecurity awareness affect mobile banking adoption, whereas digital literacy does not.

Implications – Cybercrime is a crucial aspect of mobile banking usage, making customer awareness essential. To increase customer trust, BSI needs to strengthen and enhance digital security and educate customers about cybersecurity risks. Improving the convenience of mobile banking services is crucial to attracting more users. Cybersecurity awareness is also essential; therefore, BSI needs to conduct educational programs and campaigns to improve digital literacy and reduce the negative impact of cybercrime.

Originality – The implications provide insights for banks, especially BSI, in maintaining customer trust and increasing mobile banking adoption. The results are expected to assist customers and BSI in focusing on cybersecurity, protecting personal data, and enhancing user convenience. Understanding the factors influencing mobile banking adoption in the continually evolving digital banking environment can help banks take relevant action and focus on customer needs.

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Introduction

The development of information technology has brought significant changes to the banking sector, including the innovation of digital banking services, such as mobile banking (Aboobucker & Bao, 2018). Mobile banking enables customers to conduct various banking transactions online, thus enhancing the availability and speed of banking services (Fadlan & Dewantara, 2018). It offers flexibility for transactions anytime and anywhere, making perceived ease of use crucial in shaping customers' attitudes towards online banking (Abdul Sathar et al., 2023). Public interest in mobile

banking is growing, as evidenced by Bank Indonesia's data showing an increase in the value of digital banking transactions from IDR 39.841 trillion in 2021 to IDR 52.545 trillion in 2022. However, the use of mobile banking remains challenging.

In practice, the use of mobile banking requires a certain level of skill and understanding of its features and functionalities to enhance ease of use (Majumdar & Pujari, 2022). Therefore, digital literacy is crucial for the effective use of mobile devices. However, according to data published by the Ministry of Communication and Informatics in 2022, the level of digital literacy in Indonesia is still in the medium category, with a score of 3.54 out of 5 points. Additionally, only approximately 12% of the Indonesian population has adequate information and communication technology (ICT) skills, as recorded in a report released by *We Are Social and Hootsuite* (2021). Consequently, improving digital literacy is urgent and requires further enhancement. Digital literacy is deemed important as it can assist and facilitate the use of technology.

However, in practice, cybercrime is a major challenge for digital banking today, as banks manage large amounts of financial data and other sensitive information, making them prime targets for cybercriminals (Lessambo, 2023). According to data from National Cyber and Crypto Agency (Badan Siber dan Sandi Negara, BSSN), Indonesia experienced 976,429,996 cyberattacks and traffic anomalies in 2022, after facing 1.65 billion attacks in 2021. Additionally, from 2015 to 2020, the Directorate General of the Cyber Crime Republic of Indonesia received 22,564 reports related to cybercrime, with total losses reaching an IDR of 5.03 trillion. The rapid spread of information through social media has exacerbated negative perceptions and concerns regarding cybercrime among the public. With 167 million social media users in Indonesia (*We Are Social and Hootsuite, 2023*), negative sentiments related to cybercrime can spread quickly, increasing public panic.

As banking transforms into digital channels, cybercriminals target banks and financial institutions as primary targets for various types of cybercrime, including phishing, social engineering, and malware (Lessambo, 2023). In Indonesia alone, phishing caused 164,131 cases by 2022, with significant data breaches affecting 12.7 million accounts (Surfshark, 2022). The rapid development of Indonesia's digital economy has made it crucial for banks to enhance security measures and public trust in digital banking services (Komulainen & Saraniemi, 2019). Additionally, security and trust have been found to be key determinants of behavioral intention to adopt mobile banking; therefore, adequate security and management of customer security concerns are essential, as these two factors significantly influence the use of mobile banking (Merhi et al., 2019).

Nevertheless, BSI faced negative sentiments related to cybercrime on May 8, 2023, when it experienced a ransomware attack that shocked the Indonesian public, particularly its customers. As one of the leading Islamic banks in Indonesia, BSI is used by various groups seeking to implement Islamic principles, with approximately 5.18 million BSI mobile banking users across Indonesia. This attack disrupted transaction processes for nearly a week and seriously affected economic activities. Negative sentiments spread widely through social media. Furthermore, claims from hackers identifying themselves as Ransomware Lock Bit 3.0 circulated on social media, asserting that they had successfully stolen and leaked 1.5 terabytes of customer data. This incident caused panic and psychological distress among customers, resulting in a -6.98% drop in the BSI's stock price, according to stock prices on the Indonesia Stock Exchange (Bursa Efek Indonesia, IDX). Because of this incident, maintaining trust is crucial because, according to Merhi et al. (2019), certain perceptions and emotional or irrational forces influence users' trust in technology, especially mobile banking. As a result, BSI faces significant challenges in restoring customer trust and improving its reputation in the future.

The development of the digital economy and the use of digital technology in banking have increased cyber risk, triggering negative sentiments in society. Cybercrime-related sentiments in Indonesia raise doubts and reduce trust in mobile banking. Therefore, banks need to enhance their security, convenience, and education to ensure that their transactions are safe. Referring to previous studies (Elhajjar & Ouaida, 2020; Patel & Patel, 2018), digital literacy, security, and convenience are key determinants of users' intention to use internet banking services. Additionally, a previous study by Aboobucker and Bao (2018) found that perceived trust and convenience are factors considered by users when adopting internet banking. However, in their study, perceived security

and perceived risk were not significantly influential on IB adoption of internet banking. Therefore, this study aims to delve deeper into, develop, and explore the influence of cybercrime sentiment on digital banking services, digital literacy, cybersecurity awareness, perceived security, and transaction convenience on the adoption of mobile banking, especially among BSI customers who were affected by the cyberattack issue that allegedly caused service disruptions at BSI in mid-May 2023. This research is important because understanding cybercrime sentiment in digital banking services, service security, cybersecurity awareness, and digital literacy is crucial because these sentiments are suspected to affect trust, which is essential for maintaining banking stability in Indonesia. It is hoped that the findings from this research can make a significant contribution to designing banking policies and developing more efficient strategies for mobile banking services to benefit customers.

Literature Review

Theory of Planned, Consumer and Economics Behavior

The Theory of Planned Behavior (TPB) highlight three main factors influencing individual actions: attitude toward behavior, subjective norms, and perceived behavioral control (Ajzen, 2005). Previous studies have underscored the significant impact of individual behavior on decision-making (Andam & Osman, 2019; Fauzi et al., 2022; Rahmafitria et al., 2021). Applying TPB in this research is crucial for understanding users' intentions and behaviors in using mobile banking services (Tucker et al., 2020), including exploratory tendencies and responses to the platform features of mobile banking technology (Avornyo et al., 2024). By examining these factors, we can gain deeper insights into how personal attitudes and social influences shape users' adoption of mobile banking, and how their perceived control affects their engagement with these services.

Regarding consumer behavior, Mowen and Minor (2001) discuss consumer decision-making processes, from product acceptance to usage. Kotler et al., (2016) define consumer behavior as a process of considering, choosing, purchasing, using, and evaluating products to meet individual needs. This theory clarifies the motivations, preferences, and perceptions related to security and convenience in mobile banking and explains how cybercrime influences adoption among BSI customers. Understanding these behavioral aspects is crucial for designing effective strategies to address security concerns and enhance user experience, thereby facilitating higher adoption rates of mobile banking services.

Keynes (2016) highlighted that psychological factors and expectations influence economic behavior. On the other hand, Kahneman and Tversky (1979) found that humans are irrational in economic decisions because of biases and judgment errors. Furthermore, Thaler and Sunstein (2012) explored how choice architecture influences economically desired outcomes. These theories elucidate how perceptions of risk and security impact decisions about financial technology services, including mobile banking adoption, among BSI customers.

Hypothesis Development

Relationship between sentiment on cybercrime issue sentiment in digital banking service and trust

According to research conducted by Akinbowale et al. (2023), cyberfraud in the banking industry has a significant impact on the reputation of several banks. Research conducted by Kaabachi et al. (2019) and Naeem (2021) showed that social influence and positive community perceptions significantly influence trust in internet banking. However, in this case, the sentiment regarding cybercrime issues in digital banking is assessed as negative information. Thus, sentiments regarding cybercrime issues in digital banking are suspected to affect trust. Additionally, the relationship between sentiment on cybercrime in digital banking and trust can be explained by the Theory of Economic Behavior. In this case, sentiment regarding cybercrime can act as a psychological factor influencing consumer behavior, that is, bank customers. The higher the negative sentiment related

to cybercrime, the higher the customers' concerns about digital transaction security and trust. The hypotheses formulated are as follows:

H₁: Cybercrime issue sentiment in digital banking service has a positive effect on trust

Relationship between security perception and trust

Perceived Security is an individual's assessment of the actions or protocols implemented to ensure that a financial transaction is secure and free of unauthorized access or fraud (Patel & Patel, 2018). The relationship between perceived security and trust can be explained using the Theory of Economic Behavior. According to this theory, security perception is one of the factors influencing consumer behavior. Therefore, security perception is considered as one of the factors believed to influence public trust in mobile banking adoption. Based on the research conducted by Abdul Sathar et al. (2023), Fan et al. (2018) and Susanto et al. (2016), security perception significantly influences trust in mobile banking. In turn, this trust plays a crucial role in customers' decisions to adopt mobile banking services. A higher perception of security leads to an increased level of trust, thereby encouraging more customers to use mobile-banking platforms. The hypotheses formulated are as follows:

H₂: Perceived security has a positive effect on trust

Relationship between trust and mobile banking adoption

Trust refers to customers' perceptions and beliefs regarding secure and reliable transactions (Aboobucker & Bao, 2018). Research conducted by Siyal et al. (2019) show that a lack of trust affects a lack of interest in adopting mobile banking. Additionally, according to research conducted by Ali et al. (2022), Chiu et al. (2017), and Koksal (2016), trust positively influences the adoption of mobile banking. Furthermore, the relationship between trust and mobile banking adoption can be explained by the theory of consumer behavior. In this theory, customers can evaluate the level of security and reliability of mobile banking, thus influencing them to adopt mobile banking. In addition, this trust may involve the belief that customer financial data will be well-protected and that customer transactions will not be misused. Consequently, building a robust security framework can enhance trust, leading to increased mobile-banking adoption. Therefore, financial institutions should prioritize security measures to foster trust and encourage widespread adoption. The hypotheses formulated are as follows:

H₃: Trust has a positive effect on mobile banking adoption

Relationship between transaction convenience and mobile banking adoption

Convenience in transactions refers to the perceived ease that includes factors such as the availability of payment methods, transaction speed, transaction efficiency, and user-interface friendliness of a platform used for conducting transactions (Jebarajakirthy & Shankar, 2021). Convenience has become a driver of mobile banking adoption; therefore, service convenience is considered important because it can affect customer adoption of mobile banking services (Jebarajakirthy & Shankar, 2021). Additionally, the relationship between transaction convenience and mobile banking adoption can be explained by the theory of consumer behavior. According to this theory, a customer can evaluate the convenience factors for mobile banking adoption. According to Deb and Agrawal (2017), and Majumdar and Pujari (2022), convenience significantly impacts the decision to adopt mobile banking. The ease of accessing financial services at anytime and anywhere significantly enhances the appeal of mobile banking. Moreover, streamlined and user-friendly interfaces contribute to positive customer experience, further encouraging the adoption of mobile banking services. The hypotheses formulated are as follows:

H₄: Convenience has a positive effect on the decision to use mobile banking

Relationship between digital literacy and mobile banking adoption

Digital literacy is an individual's ability to effectively and appropriately use technology and digital tools to access, evaluate, create, and communicate information in various digital contexts (Van

Deursen & Van Dijk, 2016). According to Andreou and Anyfantaki (2021), and Elhajjar and Ouaida (2020), digital literacy is one of the factors influencing people's use of mobile banking. Additionally, research conducted by Nikou et al. (2022) and Ullah et al. (2022) state that digital literacy can increase the adoption of mobile banking because digital literacy can improve a person's perception of ease. Furthermore, the relationship between digital literacy and mobile banking adoption can be explained using the Theory. In the Theory of Planned Behavior, the relationship between digital literacy and mobile banking adoption can be explained through the concepts of Attitude and Perceived Behavioral Control. In the case of mobile banking adoption, attitude relates to an individual's view on using this technology. Individuals with good digital literacy may have a better understanding of the benefits and ease of mobile banking. If their digital literacy allows them to see mobile banking as a useful and efficient solution, a positive attitude towards mobile banking adoption may occur. Additionally, the concept of Perceived Behavioral Control can relate to whether customers with good digital literacy are likely to have a higher level of convenience in using technology, and whether they may feel more confident in overcoming obstacles that may arise when using mobile banking. The hypotheses formulated are as follows:

H₅: Digital literacy has a positive effect on the decision to use mobile banking

Relationship between cybersecurity awareness and mobile banking adoption

Cybersecurity Awareness is an individual's knowledge, skills, and attitudes regarding the protection of information systems and data from cyberattacks (Alanazi et al., 2022; Quayyum et al., 2021). The relationship between cybersecurity awareness and mobile banking adoption can be explained by the Theory. This relationship can be explained by the aspect of Perceived Behavioral Control. Awareness of cybersecurity also affects behavioral control in terms of mobile banking adoption. If someone has a good understanding of how to protect themselves from cyber threats, they feel more confident in managing risks and security when using mobile banking. Cybersecurity awareness was assessed to increase user trust in security threats when using mobile banking. Users will be more comfortable using mobile banking services and be more active in conducting financial transactions through mobile banking. This is evidenced by research conducted by Khan et al. (2023), which shows that the tighter users exhibit cybersecurity awareness behavior, the more confident individuals are in their ability to protect themselves. Additionally, research conducted by Johri and Kumar (2023) shows that digital transformation in the banking sector provides many benefits; however, increased awareness of cyberattack activities, phishing, and hacking affects customer satisfaction and adoption of digital transactions. Based on research conducted by Krishna et al. (2022), from the perspective of financial institutions, increasing national and international cybersecurity awareness positively influences the use of digital payments. The hypotheses formulated are as follows:

H₆: Cybersecurity Awareness positively affects the decision to use mobile banking.

Research Methods

This type of research is quantitative and exploratory. This study aims to explore the influence of cybercrime sentiment issues on digital banking services, digital literacy, cybersecurity awareness, security, and transactional comfort on the adoption of mobile banking among users of the BSI. The primary data used in this research were collected using a questionnaire. The questionnaire used in this study used a Likert scale of 1-5. The target population in this study was BSI customers, and the sample used was BSI customers aged 20 and above who were employed in mobile banking (BSI Mobile). The sampling technique used in this study was purpose-sampling. To determine the research sample, Lemeshow et al (1997) was utilized because of the large and fluctuating nature of the population, as well as its homogenous characteristics. Applying this formula, the calculation for determining the sample size is as follows:

$$n = \frac{z^2 p (1 - p)}{d^2}$$

where, n represents the required sample size. In this formula, z is the standard value, set at 1.97, correspond to a 95% confidence level. The p term denotes the maximum estimate of the population proportion, which is 0.5, providing a conservative estimate for sample size calculations. Variable d represents the alpha or sampling error, which is set at 10%, indicating the allowable margin of error for the sample estimate.

According to the calculation using this formula, a minimum of 96 respondents was required, rounded up to 100 respondents. Therefore, this research will involve a sample size of 100 respondents who meet the specified criteria. Additionally, according to [Krejcie and Morgan \(1970\)](#), in research involving very large populations, it is often not feasible to access the entire population owing to time and budget constraints. Therefore, they suggested using a representative sample of the population to obtain results that can be generalized.

The analysis method applied to analyze the data involved the use of the SEM-PLS analysis technique. Data from the questionnaire were processed using the SEM-PLS analysis approach supported by SMART PLS software. The reason for using the SEM-PLS method is that this research is exploratory and attempts to predict and explain latent variables rather than testing a theory. This study involved five independent variables, one mediator variable, and one dependent variable. Figure 1 shows the variables used in this research are as follows ([Figure 1](#))

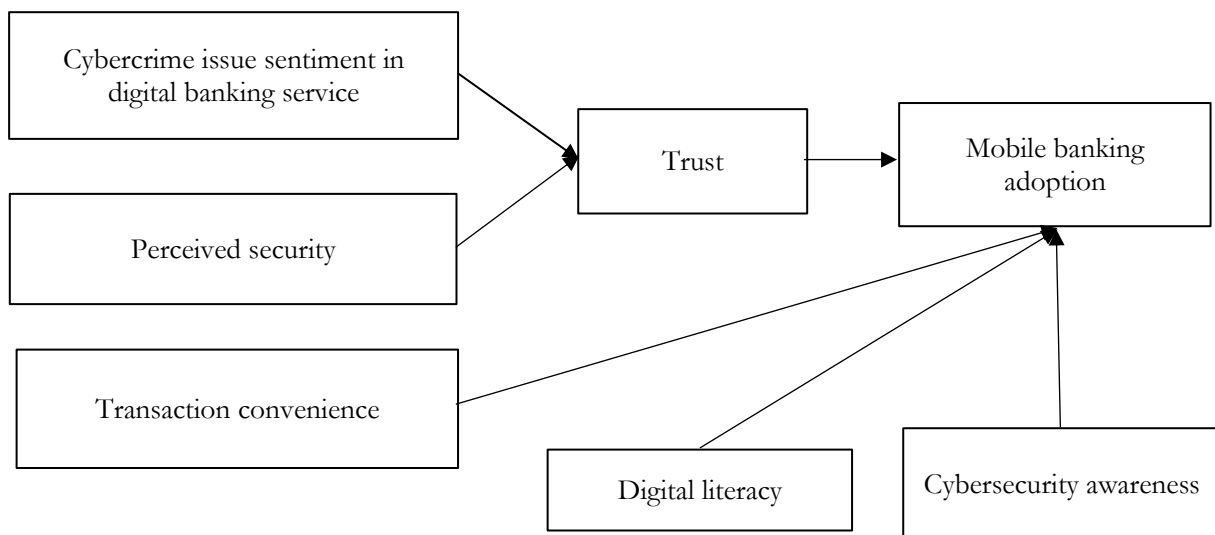


Figure 1. Model

Source: Authors' own work

Before obtaining the analysis results, several tests were conducted to ensure that the model fit the available data and to gain a better understanding of the relationships between the observed variables in the study. The tests included outer and inner model tests. The outer model test consisted of convergent validity, discriminant validity, composite reliability, and cronbach's alpha. Furthermore, the inner model test included a Path Coefficient to test the hypotheses.

Results and Discussion

In this study, most respondents were aged between 20-30 and 31-40 years, aligning with the millennial generation (born 1981-1996) and Generation Z (born 1997-2012) as defined by the Pew Research Center. This indicates that the majority of mobile banking users are from these two generations. Of the total respondents, 51% were male and 49% female. The respondents' education levels were predominantly high school graduates and bachelor's degree holders with various occupations and income levels, as detailed in [Table 1](#).

In this study, the outer model test consisted of convergent and discriminant validity, composite reliability, and Cronbach's alpha. Convergent validity is the process of measuring the extent to which the indicators used in a variable truly reflect that variable and can be measured by how well the indicators are connected to the construct being measured. An indicator is considered

to have solid validity if the outer loading value of each indicator on the respective variable is > 0.70. In this study, each indicator had outer loading values, as shown in Figure 2.

Tabel 1. Respondent characteristics

Respondent Characteristics	Category	Total
Gender	Male	51
	Female	49
Age	20-30	77
	31-40	17
	≥ 41	6
Education	Junior High School	1
	High School	54
	Bachelor's Degree	43
	Master's Degree	2
Occupation	Entrepreneur	15
	Military	16
	Civil Servant	14
	Private Employee	21
	Teacher	3
	Freelancer	14
Income	Student	17
	Rp 500.000 – Rp 2.500.000	32
	> Rp 2.500.000 – Rp 5.000.000	39
	> Rp 5.000.000 – Rp. 7.500.000	14
	> Rp 7.500.000 – Rp 10.000.000	10
	> Rp 10.000.000	5

Source: Data processing

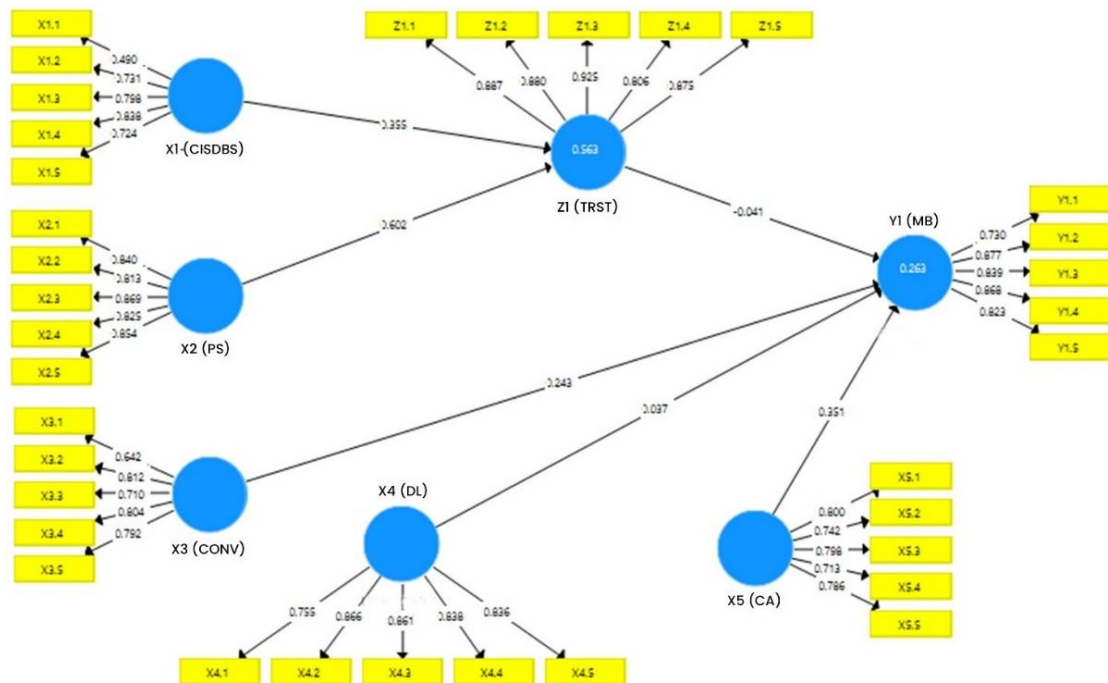


Figure 2. Estimation
Source: Data processing

The outer loading values for indicators X1.1 and X3.1 are < 0.70, with values of 0.490 and 0.642, respectively, indicating that these indicators are not solid for use. Therefore, it was necessary to eliminate these indicators. The results of outer loading from the model after elimination are listed in Table 2.

Table 2. Validity and reliability test

Variable	Indicator	Outer Loading	Cronbach's alpha	Composite reliability	AVE
Cybercrime issue sentiment in digital banking service (X1)	X1.2	0,730	0,801	0,870	0,626
	X1.3	0,811			
	X1.4	0,870			
	X1.5	0,747			
Perceived security (X2)	X2.1	0,840	0,896	0,923	0,613
	X2.2	0,813			
	X2.3	0,869			
	X2.4	0,825			
	X2.5	0,854			
Convenience (X3)	X3.2	0,823	0,790	0,863	0,613
	X3.3	0,703			
	X3.4	0,815			
	X3.5	0,787			
Digital literacy (X4)	X4.1	0,823	0,889	0,918	0,693
	X4.2	0,703			
	X4.3	0,815			
	X4.4	0,787			
	X4.5	0,823			
Cybersecurity awareness (X5)	X5.1	0,755	0,829	0,878	0,591
	X5.2	0,866			
	X5.3	0,861			
	X5.4	0,838			
	X5.5	0,836			
Trust (Z1)	Z1.1	0,886	0,923	0,942	0,766
	Z1.2	0,879			
	Z1.3	0,926			
	Z1.4	0,807			
	Z1.5	0,875			
Mobile banking adoption (Y1)	Y1.1	0,731	0,885	0,916	0,688
	Y1.2	0,878			
	Y1.3	0,839			
	Y1.4	0,868			
	Y1.5	0,822			

Source: Data processing

Then, a check for discriminant validity was conducted to measure the extent to which the two-factor constructs or latent variables measured by different indicators were significantly different from each other. discriminant validity can be checked by examining the value of average variance extracted (AVE), which measures the extent to which the variation is explained by the factor constructs or latent variables on the indicators used to measure them. AVE values considered good are usually 0.50 or higher, indicating that the construct explains more than half of the indicator variance (Hair et al., 2016). In this study, the AVE values for each variable were > 0.50, as shown in Table 4, indicating that the variability explained by the indicators used to measure these constructs was relatively large. Subsequently, a check for composite reliability values, which is a measure of the internal reliability of factor constructs consisting of several indicators or items, was conducted. The composite reliability value illustrates how well the indicators correlate with each other and measures the same factor construct (Hair et al., 2016). The composite reliability value was greater than 0.70. In this study, all variables obtained composite reliability values > 0.70, as seen in Table 4. Finally, Cronbach's alpha values, which measure the extent to which items in the scale correlate with each other and measure the same construct, were examined. A good Cronbach's alpha value was obtained when it was greater than 0.70. In this study, the Cronbach's alpha values can be seen in Table 2, indicating that the value is > 0.70, which means it is sufficiently good.

The inner model is a structural model used to connect latent variables with path coefficients, aiming to analyze the influence of latent variables, as explained by Ghazali (2014). In the inner model testing phase, the steps to be taken involve estimating the path coefficients, which assist in measuring the strength and direction of the relationships between variables in the model. In this study, the SmartPLS application was used to process the data, and the estimated path coefficient results were obtained from the analysis. In the path coefficient table, we can observe the t-value (T-statistics) and p-value (P-value). For this study, the t-table value was set to 1.984. The estimation results obtained from this analysis are as follows:

Tabel 3. Path coefficients

Hypothesis	Relationship	Original sample	Sample mean	STDEV	T Statistics	P Value
H1	Cybercrime Issue Sentiment in Digital Banking Service (X1) → Trust (Z1)	0,341	0,348	0,078	4,381	0,000
H2	Perceived Security (X2) → Trust (Z1)	0,607	0,604	0,065	9,262	0,000
H3	Trust (Z1) → Mobile Banking Adoption (Y1)	-0,058	-0,055	0,135	0,431	0,667
H4	Convenience (X3) → Mobile Banking Adoption (Y1)	0,278	0,281	0,115	2,426	0,015
H5	Digital Literacy (X4) → Mobile Banking Adoption (Y1)	0,019	0,045	0,216	0,087	0,931
H6	Cybersecurity Awareness (X5) → Mobile Banking Adoption (Y1)	0,360	0,357	0,146	2,457	0,014

Source: Data processing

Based on the output estimation results in Table 3, several hypotheses are supported. H1, regarding the sentiment of cybercrime issues in digital banking, demonstrates a positive and significant influence on trust, as indicated by a t-statistic of 4.381 ($p < 0.05$). Similarly, H2, concerning security perception, showed a positive and significant impact on trust, with a t-statistic of 9.262 ($p < 0.05$). Conversely, H3, related to trust, exhibits a negative correlation and an insignificant impact on mobile banking adoption, with a t-statistic of 0.431 ($p > 0.05$), leading to its rejection. H4, regarding convenience, demonstrated a positive and significant influence on trust, with a t-statistic of 2.426 ($p < 0.05$). H5, concerning digital literacy, shows no significant impact on mobile banking adoption, with a t-statistic of 0.087 ($p > 0.05$), resulting in rejection. Finally, H6, concerning cybersecurity awareness, displays a positive and significant influence on trust, supported by a t-statistic of 2.457 ($p < 0.05$). These findings underscore the importance of cybersecurity awareness and perceptions in fostering trust and the adoption of mobile banking services.

The research findings show that cybercrime issue sentiment in digital banking services has a positive and significant impact on trust. This finding is in line with previously established hypotheses and is consistent with previous research studies (Adiningtyas & Auliani, 2024; Bigné et al., 2023; Han et al., 2019; Niu et al., 2020), which indicate that negative sentiments and news can influence public trust. Additionally, cybercrime issue sentiment in digital banking services is a negative sentiment that affects trust. Other studies (Kaabachi et al., 2019; Naeem, 2021) mention that social influence and positive perceptions significantly affect trust in internet banking. However, in this study, the negative information received by the public reduced trust. This cybercrime sentiment aligns with the theory of economic behavior, which states that psychological factors can influence individual behavior.

The cybercrime sentiment in digital banking services has serious implications for trust. The negative nature of this sentiment can trigger panic among the public, such as transferring funds to other banks or mass withdrawals (rush money). According to Suarka and Setena (2021), threats to fund withdrawals arise when public trust in financial institutions decreases. Cybercrime sentiment has the potential to affect the stability of the banking sector and financial performance, as banks rely heavily on high levels of customer trust. To maintain trust, BSI must take proactive steps to mitigate cybercrime sentiment. Educating and actively protecting customer trust are crucial.

Additionally, to minimize negative sentiments from hoax news or unreliable sources, banks must provide information services that the public can use to confirm the truth of such issues. Increasing education on cybercrime issues, data security, and better use of mobile banking also needs to be emphasized.

Statistical analysis indicates that security perception positively and significantly influences trust, consistent with the hypotheses and previous research (Chov & Ou, 2022; Fan et al., 2018; Li & Wang, 2020; Spadaro et al., 2020). This factor is crucial in decision making regarding mobile banking adoption, aligning with economic behavior theories, highlighting the role of psychological factors. Customers perceive security perception as crucial, expecting strong protection of personal data and transactions from BSI (Abdul Sathar et al., 2023). Sentiment on cybercrime issues adds urgency for banks to ensure security, because failure in this aspect can reduce customer trust (Krishna et al., 2022). Therefore, banks need to play an active role in maintaining security perceptions to ensure that customers feel safe using mobile banking services.

Based on the statistical analysis results of this study, trust does not have an influence on the adoption of mobile banking. This finding contradicts the initial hypothesis and does not align with the theory of consumer behavior, which suggests that customers evaluate the security and reliability of mobile banking to build trust and encourage adoption. According to this theory, trust encompasses the belief that customers' financial data will be well protected and transactions will not be misused. However, this study shows that the level of trust does not affect mobile-banking adoption.

Several factors might have influenced this finding. First, the convenience of using mobile banking offers ease and flexibility, allowing transactions to be made anytime and anywhere (Bankuoru Egala et al., 2021; Pal et al., 2021). Therefore, BSI needs to maintain convenience to ensure that customers continue using mobile banking services (BSI Mobile). Second, the values and principles of sharia offered by BSI are important factors. BSI, one of the largest sharia banks in Indonesia with 19 million customers, offers sharia principles that avoid usury in line with Islamic teachings. This is particularly relevant, as Indonesia has one of the largest Muslim populations worldwide. This religious attribute affects consumer attitudes toward products and economic shopping behavior (Agarwala et al., 2019), with information about halal being a crucial factor in purchase decisions (Kornitasari & Faidah, 2022). Research by Suhartanto et al. (2020) and Raza et al. (2019) shows that religiosity and sharia values influence mobile banking adoption, especially in sharia banks.

Third, high cybersecurity awareness enables customers to anticipate cyber threats and continue to use mobile banking. Addae et al. (2019), Simonet and Teufel (2019), and Wang et al. (2022) state that cybersecurity awareness affects individual behavior in adopting new technologies. Individuals with a good understanding of security are more confident in their ability to recognize and deal with threats, and are proactive in safeguarding their personal data. Therefore, educating customers on how to secure personal data and avoid cybercrime is crucial.

In conclusion, trust is not the main factor in mobile-banking adoption. The development of information technology has made mobile banking essential because of its flexibility, convenience, and ease of use. Research by (Chov & Ou, 2022 and Tsai et al., 2022) supports the idea that the usability and mobility of mobile banking applications influence adoption. Negative sentiments related to cybercrime issues, especially claims of data breaches at BSI, may affect customer trust levels. However, despite a decrease in trust, customers still adopt mobile banking because of other factors, such as ease of use and flexibility.

The research results indicate that convenience has a significant and positive influence on mobile banking adoption, consistent with the hypotheses and previous research findings (Bankuoru Egala et al., 2021; Pal et al., 2021). Other studies also note that inconvenience can be a barrier to mobile banking adoption (Saxena et al., 2022), aligning with the theory of consumer behavior, which emphasizes the evaluation of comfort levels in decision-making (Saxena et al., 2022). Convenience is considered important because it provides ease, time efficiency, and flexibility for users to conduct transactions (Bankuoru Egala et al., 2021; Pal et al., 2021). Diverse transaction features also enhance the attractiveness of mobile banking services, thereby replacing the need for

direct visits to branch offices. Therefore, BSI needs to continue innovating and improving its services to ensure user convenience in mobile banking.

Statistical analysis indicates that digital literacy does not influence mobile banking adoption, contrary to the initial hypotheses and the theory of planned behavior, which emphasizes attitudes and perceived behavioral control (Attitude and perceived behavioral control). Digital literacy should provide a better understanding of the benefits and ease of using mobile banking, although the research findings suggest otherwise.

This may be because of user comfort, which allows people with varying levels of digital literacy to adopt mobile banking. User-friendly interfaces and ease of application can enhance adoption, regardless of individual digital literacy levels (Huang & Benyoucef, 2022). Millennials and Generation Z, who are the most respondents, tend to have high digital literacy because they have grown up with technological advancements (Khulwa & Luthfia, 2023; Windiarti et al., 2020). Comfort, security, flexibility, and other factors are likely to have a more significant influence on mobile banking adoption than digital literacy, especially among millennials and Generation Z.

Based on the results of the statistical analysis, it was found that cybersecurity awareness has a positive and significant impact on mobile banking adoption, consistent with the hypotheses and Theory of Planned Behavior. This finding is also supported by previous research (Addae et al., 2019; Simonet & Teufel, 2019; Wang et al., 2022), which indicates that individuals with cybersecurity awareness tend to be more confident in facing cyber risks and proactive in protecting their personal data.

Cybersecurity awareness is crucial in shaping individuals' confidence in their ability to identify and mitigate cyber threats when using digital banking services. Moreover, individuals who are aware of cybersecurity tend to take preventive actions and have a better understanding of digital security issues. Therefore, enhancing cybersecurity awareness is vital to increasing trust in adopting technology, particularly in digital banking. In practice, BSI and other financial institutions are expected to continue educating customers on the importance of data security and preventive measures against cyber-attacks. Concrete efforts are needed to enhance cybersecurity awareness among customers, where BSI should integrate digital security education into its digital banking application, providing practical tips and regular notifications about security threats directly to users.

Conclusion

This study highlights various factors that influence the adoption of mobile banking by customers with BSI. The findings indicate that cybercrime issue sentiment in digital banking services and the perception of security significantly impact customers' trust in adopting mobile banking. Additionally, aspects of convenience and cybersecurity awareness have been shown to influence customers' decisions to use mobile banking. However, this study also found that digital literacy and the level of trust do not directly have a significant impact on mobile banking adoption. This suggests that although customers have good digital literacy, convenience and security perceptions play a more crucial role in their decision to use these services. Therefore, BSI must focus on enhancing the security and convenience of mobile banking services to maintain and increase customer trust. Furthermore, raising cybersecurity awareness among customers will help them better manage security risks and maintain digital safety when using mobile-banking services.

To increase customer trust, BSI needs to strengthen and enhance digital security and educate customers about cybersecurity risks. Improving the convenience of mobile banking services is also essential for attracting more users. Cybersecurity awareness is crucial; therefore, BSI should conduct educational programs and campaigns to increase digital literacy and reduce the negative impacts of cybercrime. This study provides a foundation for BSI to develop more effective strategies to increase mobile banking adoption and strengthen trust relationships with customers. The results of this study are also expected to contribute to the development of better banking policies, especially in addressing negative sentiments related to cybercrime. The factors of religiosity and user demand specifically influence mobile-banking adoption. As the largest sharia bank in Indonesia, BSI needs to leverage sharia values to attract more users and tailor services to meet the demands of modern users who seek ease and flexibility in transactions.

Although this study provides an understanding of the factors influencing mobile banking adoption related to cybercrime, further research with a larger sample and specific geographical variations is needed. Future research should also consider factors such as age, infrastructure quality, device performance, consumer behavior, and perceived usage costs.

Author contributions

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