ANALYSIS OF THE EFFECT OF PERCEIVED RISK, SERVICE QUALITY AND CUSTOMER TRUST TOWARD CUSTOMER LOYALTY AFTER A CYBER ATTACK (STUDY IN BANK SHARIA INDONESIA)

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Abstract: *This research aims to analyze the influence of perceived risk, service quality, and customer trust on customer loyalty after a cyberattack on Bank Syariah Indonesia (BSI). The research method used is quantitative, conducted at Bank Syariah Indonesia. The study attempts to address four research questions: how perceived risk, service quality, and customer trust affect customer loyalty after a cyberattack on BSI; to what extent perceived risk affects customer loyalty; how service quality plays a role in influencing customer loyalty; and whether customer trust affects customer loyalty after a cyberattack on BSI. The variables examined include perceived risk, service quality, customer trust, and customer loyalty. The findings of this research are expected to provide a better understanding of the impact of these factors on customer loyalty after a cyberattack on BSI. The benefits of this research include theoretical contribution, business strategy guidelines, customer protection, and improved banking security. The results of this study are expected to benefit practitioners in the banking industry, especially BSI, as well as academics and researchers in the fields of management, finance, and cyber security.*

Keywords: *Perceived Risk, Service Quality, Customer Trust, Customer Loyalty, Cyberattack, Bank Syariah Indonesia.*

Abstraksi: Penelitian ini bertujuan untuk menganalisis pengaruh risiko yang dirasakan, kualitas layanan, dan kepercayaan pelanggan terhadap loyalitas pelanggan setelah terjadinya serangan cyber pada Bank Syariah Indonesia (BSI). Metode penelitian yang digunakan adalah kuantitatif dengan mengambil lokasi penelitian di Bank Syariah Indonesia. Penelitian ini mencoba menjawab empat rumusan masalah, yaitu bagaimana risiko yang dirasakan, kualitas layanan, dan kepercayaan pelanggan mempengaruhi loyalitas pelanggan setelah terjadi serangan cyber pada BSI, sejauh mana risiko yang dirasakan mempengaruhi loyalitas pelanggan, bagaimana kualitas layanan berperan dalam memengaruhi loyalitas pelanggan, dan apakah kepercayaan pelanggan memengaruhi loyalitas pelanggan setelah terjadi serangan cyber pada BSI. Variabel yang diteliti meliputi risiko yang dirasakan, kualitas layanan, kepercayaan pelanggan, dan loyalitas pelanggan. Temuan dari penelitian ini diharapkan dapat memberikan pemahaman yang lebih baik tentang dampak faktor-faktor tersebut terhadap loyalitas pelanggan setelah terjadinya serangan cyber pada BSI. Manfaat dari penelitian ini meliputi kontribusi teoritis, panduan strategi bisnis, perlindungan pelanggan, dan peningkatan keamanan perbankan. Hasil penelitian ini diharapkan dapat memberikan manfaat bagi praktisi di industri perbankan, terutama BSI, serta bagi akademisi dan peneliti di bidang manajemen, keuangan, dan keamanan cyber.

Kata Kunci: Risiko yang Dirasakan, Kualitas Layanan, Kepercayaan Pelanggan, Loyalitas Pelanggan, Serangan Cyber, Bank Syariah Indonesia.

Introduction

In an increasingly advanced digital age, cyberattacks have become a serious threat to organizations and individuals. Cyberattacks can result in huge losses, both financially and reputationally. In Indonesia, cyberattacks are also on the rise with reports of a significant number of attacks. According to a CNN Indonesia report (CNNIndonesia.com, 2022), Indonesia is reported to have experienced around 700 million cyberattacks in 2022. These attacks come from various modes, including the increasingly dominant mode of extortion. This shows that cyberattacks have become a serious threat to digital infrastructure in Indonesia.

In the context of banking, cyber-attacks can threat the security of customer data and personal information. Events such as data leaks caused by cyberattacks can have a detrimental impact on customers and the image of the bank itself. Therefore, it is important for banks to understand the impact of cyberattacks and develop effective strategies to protect customers and maintain their trust. Cyberattacks have become an increasingly real and complex threat in the banking world and the financial sector at large. Financial institutions, including banks, are prime targets for cyberattacks seeking to steal sensitive data, damage system infrastructure, or disrupt banking services. Cyberattacks can have a significant impact on a bank's reputation, customer trust, and customer loyalty. One of the banks that suffered a cyber-attack was Bank Syariah Indonesia (BSI), which is one of the largest Islamic banks in Indonesia.

The cyberattack on Bank Syariah Indonesia (BSI) reflects the challenges faced by the banking sector in maintaining customer security and trust in the digital era. The incident of the cyberattack on BSI disclosed through references provided highlights the complexity of the cyber threats faced by banks as well as their impact on customers and the banking industry as a whole. In addition, the discovery of thousands of cyber threats in 2022 by BSI confirms the complexity and escalation of cyberattacks occurring in the banking industry. Although customer data is claimed to remain secure, this illustrates that cyberattacks are not only a potential threat, but have also had a real impact on banks

Tabel 1. Threats of Cybercrime against BSI Customer 2022

No	Segments	Cases
1	Social Engine	1.767
2	Scam in ATM Prima	232
3	Scam in ATM Bersama	64

Source: katadata.com, 2023

In 2022, BSI found 1,767 phishing/social engineering attempts against its customers. Phishing is sending fake website addresses to customers to steal personal information. Social engineering is part of phishing, where perpetrators direct customers to open certain websites. During that year, BSI also detected 232 cases of suspected skimming in the ATM Prima network and 64 cases in the ATM Bersama network. Skimming is the theft of ATM card data that can be done with a hidden camera in an ATM machine or a special tool to copy card data.

Theoretical Studies

Consumer Behaviour

Consumer behaviour encompasses a multifaceted process involving various stages from searching and selecting to buying, using, and evaluating products or services to fulfill individual needs and desires. As described by Schiffman and Kanuk (2006), it's the actions exhibited by consumers as they navigate through these stages in pursuit of satisfaction. Kotler and Keller (2008) broaden this definition, emphasizing the study of how individuals, groups, or organizations engage in selecting, purchasing, using, and disposing of goods or services to fulfill needs, often influenced by ideas or experiences. This intricate process, as highlighted by various experts, is shaped by both environmental and individual factors, as articulated by Mulyana (2019). Environmental factors such as culture, social class, family dynamics, values, and societal norms interplay with individual factors to shape consumer behaviour.

Perceived Risk

In the context of banking, perceived risk is an individual's perception of potential losses or uncertainties that may occur in a transaction or interaction with an organization. Perceived risk in banking can include the risk of loss of funds, the risk of personal information security, the risk of quality of service, and the risk of the reputation of the organization. Previous research has shown that perceived risk has a significant influence on consumer behavior, including consumer loyalty (Hennig-Thurau, Gwinner, & Gremler, 2002).

Service Quality

Service quality, as defined, serves as a metric for evaluating how effectively service providers meet customers' expectations throughout their interactions. This encompasses various dimensions, including responsiveness, reliability, security, empathy, and tangible evidence of service. Extensive research has highlighted the substantial positive impact of service quality on consumer loyalty (Cronin & Taylor, 1992; Parasuraman, Zeithaml, & Berry, 1988).

Customer Trust

Customer trust is fundamental in fostering enduring relationships between businesses and consumers, representing the confidence or faith consumers have in a business or product. It serves as a cornerstone for developing long-term connections. Previous research has consistently demonstrated the significant positive impact of customer trust on customer loyalty (Morgan & Hunt, 1994; Sirdeshmukh, Singh, & Sabol, 2002).

Customer Loyalty

Customer loyalty is a crucial aspect of consumer behavior, often measured using the Loyalty scale developed by Yoon and Suh (2003). This scale encompasses various statements designed to gauge the degree of consumers' inclination to continue purchasing products or utilizing services from a specific organization, predicated on their past experiences. The statements in this scale encapsulate aspects such as repeat purchase intent, recommendations to others, and commitment to the organization.

Research Hypothesis
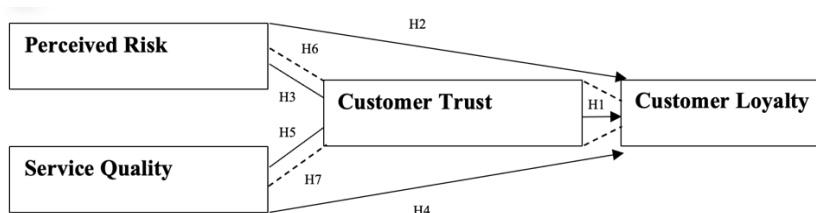
Figure 1. Hypothesis Model

In this study, seven hypotheses will be tested to understand the relationships among the variables under investigation.

H1: Posits that customer trust is influenced by perceived risk and service quality.
H2: Assumes that perceived risk affects customer loyalty.
H3: Focuses on the impact of service quality on customer loyalty.
H4: Asserts that customer trust significantly positively impacts customer loyalty.

H5: Suggests that customer trust mediates the relationship between perceived risk and service quality with customer loyalty.

H6: Emphasizes that perceived risk has a direct impact on customer trust.

H7: Examines the mediating effect of service quality in the relationship between service quality and customer loyalty.

Research Methods

This study used a type of quantitative research. This type of quantitative research aims to collect numerically measurable data and apply statistical analysis methods to test hypotheses and answer research questions. In conducting this research, researchers will use a sampling technique in the form of non-probability sampling. This non-probability sampling is a sampling technique where each member in a population does not have the same opportunity as the other members (Saptutyningsi & Setyaningrum, 2019). Quantitative data in this study was sourced from the results of questionnaires that had been answered by respondents totaling 100 respondents and processed with Smart PLS version 3.

Results and Discussion

Table 1. Outer Loading Result

	Perceived Risk	Service Quality	Customer Trust	Customer Loyalty
X1.1	0.923			
X1.2	0.895			
X1.3	0.874			
X1.4	0.911			
X1.5	0.912			
X1.6	0.875			
X2.1		0.881		
X2.2		0.896		
X2.3		0.899		
X2.4		0.866		
X2.5		0.813		
Z1.1			0.859	
Z1.2			0.872	
Z1.3			0.804	
Z1.4			0.876	
Z1.5			0.756	
Z1.6			0.720	
Y1.1				0.924
Y1.2				0.834
Y1.3				0.862
Y1.4				0.871
Y1.5				0.807
Y1.6				0.797

Source: Processed primary data, 2024

Table 1 provides a thorough examination of validity testing, specifically focusing on outer loading scores, crucial for assessing convergent validity in research studies, particularly in fields like psychology, sociology, and business. These scores reflect the strength of the relationship between each indicator and its corresponding latent variable. All outer loading scores for Perceived Risk, Service Quality, Customer Trust, and Customer Loyalty exceed the 0.70 threshold, indicating robust correlations. For example, indicators related to Perceived Risk, Service Quality, Customer Trust, and Customer Loyalty consistently demonstrate high outer loading scores, affirming convergent validity. Such validation underscores the reliability of the

measurement instrument used, ensuring accurate data collection and laying a strong foundation for subsequent analyses and interpretations. Ultimately, the findings validate the effectiveness of the measurement instrument in capturing intended constructs and highlight the importance of rigorous validation procedures in research.

Table 2. Average Variance Extracted Result

	Average Variance Extracted (AVE)
Perceived Risk	0.808
Service Quality	0.760
Customer Trust	0.667
Customer Loyalty	0.723

Source: Processed primary data, 2024

Table 2 outlines the results of the Average Variance Extracted (AVE) analysis for four key variables: Perceived Risk, Service Quality, Customer Trust, and Customer Loyalty, crucial in assessing convergent validity in structural equation modelling (SEM) or confirmatory factor analysis (CFA). According to Fornell and Larcker (1981), a variable is deemed valid if its AVE score surpasses 0.5, indicating that over half of the variance in the indicators relates to the latent construct. The table displays AVE values of 0.808 for Perceived Risk, 0.760 for Service Quality, 0.667 for Customer Trust, and 0.723 for Customer Loyalty, all exceeding the threshold. These scores signify that each variable effectively captures a substantial portion of variance from its indicators, validating their representation of the constructs they intend to measure. For instance, the AVE score of 0.808 for Perceived Risk implies that approximately 80.8% of the variance in its indicators is attributed to the latent construct. Similarly, the AVE scores for Service Quality, Customer Trust, and Customer Loyalty also surpass 0.5, affirming their validity. Overall, these findings support the suitability of the data for further analysis, bolstering confidence in the reliability and accuracy of the study's outcomes.

Table 3. Discriminant Validity

	Customer Loyalty	Customer Trust	Perceived Risk	Service Quality
Customer Loyalty	**0.850**			
Customer Trust	0.718	**0.817**		
Perceived Risk	0.627	0.689	**0.899**	
Service Quality	0.563	0.612	0.488	**0.872**

Source: Processed primary data, 2024

Table 3 showcases the Fornell-Larcker criterion for discriminant validity in structural equation modelling (SEM) or confirmatory factor analysis (CFA), crucial for validating measurement models. It presents the squared root of the average variance extracted (AVE) for each construct alongside the correlations between constructs. The criterion suggests that discriminant validity is established when the AVE root exceeds the correlation coefficients between a construct and others. In this table, the AVE roots for Customer Loyalty, Customer Trust, Perceived Risk, and Service Quality surpass their respective correlation coefficients with other constructs, affirming discriminant validity. These results indicate that the latent constructs are distinct and effectively measure separate dimensions. Establishing discriminant validity

through this criterion complements other methods like cross-loadings. Overall, the findings support the validity and reliability of the constructs assessed, contributing to advancing knowledge in the field of study.

Table 4. Cross Loading Result

	Perceived Risk	Service Quality	Customer Trust	Customer Loyalty
X1.1	**0.923**	0.455	0.632	0.613
X1.2	**0.895**	0.458	0.653	0.536
X1.3	**0.874**	0.392	0.626	0.552
X1.4	**0.911**	0.439	0.567	0.507
X1.5	**0.912**	0.451	0.665	0.607
X1.6	**0.875**	0.435	0.563	0.556
X2.1	0.416	**0.881**	0.556	0.482
X2.2	0.501	**0.896**	0.535	0.493
X2.3	0.431	**0.899**	0.545	0.512
X2.4	0.418	**0.866**	0.538	0.517
X2.5	0.357	**0.813**	0.492	0.446
Z1.1	0.642	0.511	**0.859**	0.619
Z1.2	0.626	0.589	**0.872**	0.669
Z1.3	0.492	0.536	**0.804**	0.593
Z1.4	0.597	0.541	**0.876**	0.588
Z1.5	0.559	0.401	**0.756**	0.573
Z1.6	0.434	0.395	**0.720**	0.451
Y1.1	0.626	0.544	0.645	**0.924**
Y1.2	0.541	0.514	0.659	**0.834**
Y1.3	0.590	0.513	0.573	**0.862**
Y1.4	0.544	0.539	0.645	**0.871**
Y1.5	0.440	0.342	0.616	**0.807**
Y1.6	0.431	0.389	0.512	**0.797**

Source: Processed primary data, 2024

The table displays cross-loading results, revealing correlations between observed variables and latent constructs. It assesses whether observed variables predominantly relate to their intended constructs or exhibit potential cross-loadings. Discriminant validity is affirmed as cross-loading scores for observed variables do not exceed the 0.7 threshold. These results offer insights into construct relationships, aiding in measurement model refinement and strengthening the study's validity and reliability.

Table 5. Composite Reliability Result

	Cronbach's Alpha	Composite Reliability
Perceived Risk	0.952	0.962
Service Quality	0.921	0.941
Customer Trust	0.899	0.923
Customer Loyalty	0.923	0.940

Source: Processed primary data, 2024

Table 5 presents composite reliability measures, including Cronbach's Alpha and Composite Reliability, for four constructs: Perceived Risk, Service Quality, Customer Trust, and

Customer Loyalty. All constructs exhibit high reliability, with Cronbach's Alpha and Composite Reliability scores exceeding 0.7, indicating strong internal consistency. Perceived Risk and Service Quality demonstrate exceptionally high reliability, while Customer Trust and Customer Loyalty show slightly lower but still substantial reliability. These results affirm the reliability of the measurement items and reinforce the validity of the study's instruments.

Table 6. R-Square Calculation Result

Variable	R Square
Customer Trust	0.575
Customer Loyalty	0.568

Source: Processed primary data, 2024

The results of the R-Square calculation in the table above show how much variability in a variable can be explained by the model or factors being observed. R-Square is commonly used in the context of regression analysis to provide information about how well a statistical model can account for variations in observed data. In this case, there are two variables, namely Customer Loyalty and Customer Trust, with R-Square values of 0.568 and 0.575 respectively.

Table 7. F-Square Calculation Result

Variable	Customer Loyalty	Customer Trust	Perceived Risk	Service Quality
Customer Loyalty				
Customer Trust	0.203			
Perceived Risk	0.063	0.472		
Service Quality	0.043	0.235		

Source: Processed primary data, 2024

The provided F-Square table presents the results of calculations aimed at assessing the strength of relationships among various variables examined in a research or analysis. Each cell in the table represents an F-Square value indicating how much variability in one variable can be explained by variability in another variable. In the context of this table, there are four observed variables: Customer Loyalty, Customer Trust, Perceived Risk, and Service Quality.

Table 8. Hypothesis Calculation Result

Variable	Path Coefficient	T-Statistic	P-Values	Conclusion
Customer Trust > Customer Loyalty	0.454	2.811	0.005	H1 Accepted
Perceived Risk > Customer Loyalty	0.229	2.806	0.005	H2 Accepted
Perceived Risk > Customer Trust	0.513	3.329	0.001	H3 Accepted
Service Quality > Customer Loyalty	0.173	1.194	0.233	H4 Rejected
Service Quality > Customer Trust	0.362	2.360	0.019	H5 Accepted
Perceived Risk > Customer Trust > Customer Loyalty	0.233	2.024	0.043	H6 Accepted
Service Quality > Customer Trust > Customer Loyalty	0.164	2.209	0.028	H7 Accepted

Source: Processed primary data, 2024

The analysis of factors affecting customer loyalty after a cyber attack on Bank Syariah Indonesia (BSI) is closely related to the issues and research background that have been raised previously. The findings show that there is a positive and significant influence between the risk perceived by customers and customer loyalty. This suggests that the higher the level of risk perceived by customers after a cyberattack, the lower the likelihood of them remaining loyal to BSI. In addition, the findings also show a positive and significant influence between customer trust in the bank and customer loyalty. The higher the level of trust customers have in BSI in keeping data secure and countering cyberattacks, the higher the likelihood that they will remain loyal to the bank. However, a positive and significant influence between the risks perceived by customers and customer trust in the bank was also found. These results show that the higher the level of risk perceived by customers regarding data security after a cyberattack, the lower their level of trust in BSI. Meanwhile, the effect of service quality on customer loyalty is not significant. While high service quality is important for improving customer satisfaction, the results suggest that in the context of cyberattacks, other factors such as risk perception and customer trust may have a more dominant influence on customer loyalty. In terms of customer trust, the provision of high-quality services by BSI can increase the level of customer confidence in the bank's ability to handle cyber attacks and keep their information safe. The findings also show that the risk perceived by customers not only directly affects customer loyalty, but also indirectly through its influence on customer trust in the bank. Similarly, the quality of service not only directly affects customer loyalty, but also through its influence on customer trust in the bank. Overall, the findings support the assumption that risk perception, service quality, and customer trust are important factors in influencing customer loyalty after a cyberattack on Bank Syariah Indonesia. With a better understanding of the relationship between these factors, BSI can develop more effective strategies to reduce risk, increase customer satisfaction, and strengthen relationships with their customers in the aftermath of cyberattacks.

Conclusion

Analysis of factors affecting customer loyalty after the cyber attack on Bank Syariah Indonesia (BSI) yielded several important conclusions. First, research confirms a positive and significant relationship between perceived risk and customer loyalty. This suggests that a high perception of risk after a cyberattack can reduce customer loyalty to BSI. Second, there is a significant positive relationship between customer trust and loyalty. This suggests that a high level of trust in BSI's ability to protect data and address cyber threats correlates with increased customer loyalty. Third, although expected otherwise, perceived risks after a cyberattack can increase customer trust in BSI through transparency and effective risk management strategies. Fourth, although service quality is important for customer satisfaction, the study did not find a significant effect on customer loyalty post-cyberattack. However, high quality of service can increase customer confidence in the bank. Fifth, customer trust mediates the relationship between perceived risk and customer loyalty, as well as between service quality and customer loyalty. This shows that strengthening customer trust is important to reduce the negative impact of perceived risk and increase the positive impact of service quality on loyalty. Sixth, perceived risk also mediates the relationship between service quality and customer loyalty. Therefore, effective risk management is needed to increase the positive influence of service quality on customer loyalty. In conclusion, the study emphasizes the importance of transparency, effective risk management, and service improvement to strengthen customer trust, reduce perceived risks, and ultimately increase customer loyalty after a cyberattack.

Recommendations

Bank Syariah Indonesia (BSI) can take several proactive steps to mitigate the impact of cyber-attacks and maintain customer loyalty. Firstly, prioritizing proactive risk mitigation efforts, such as investing in robust cybersecurity measures and incident response strategies, can help alleviate customer concerns and maintain trust. Continuous service improvements should also be

a focus, ensuring high-quality services that exceed customer expectations despite cybersecurity challenges. Trust-building initiatives, including transparent communication about security measures and personalized customer support, are crucial for fostering trust and loyalty. Comprehensive employee training and awareness programs can reinforce cybersecurity defenses and enhance customer trust. Collaboration and knowledge sharing with industry partners and regulatory bodies can help BSI stay ahead of emerging threats. Additionally, enhancing crisis management capabilities and prioritizing continuous customer engagement through proactive communication and feedback mechanisms are essential for maintaining customer loyalty and organizational resilience. These recommendations collectively position BSI to effectively address the challenges posed by cyber-attacks, ensuring its reputation as a trusted and resilient institution in the banking sector.

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