

**CYBER ATTACK RISK IN COMMITMENT TO USE
BANKING SERVICES: NORTHSUMATRA EVIDANCE****Desi Khofifah^{1*}, Arif Pratama Marpaung²**^{1,2}Universitas Muhammadiyah Sumatera Utara

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*Email : desikhofifah0@gmail.com**ABSTRACT**

This study aims to examine the impact of cyberattack awareness and the level of customer commitment after the cyberattack. This study integrates the trust-commitment theoretical framework for the relationship of trust and commitment to the use of online banking services. Least-squares structural equation modeling (SEM) was used to explore the relationship between customer trust, which is the result of continuous use, and customer perceptions of the bank's cybersecurity affirmative action. The data collection technique used a survey method with a questionnaire. The population of this study was all bank customers in North Sumatra Province, Indonesia, totaling 277 respondents. Regression analysis was used to test this hypothesis using the Structural Equation Modeling (SEM) approach using Smart-PLS. The results of this study indicate that there is an influence of cyber security on commitment in using banking services. Furthermore, the perception of transaction risk and online services shows the strengthening of customer commitment in using banking services. However, all the variables tested did not show a relationship on the trust variable. This study contributes to the literature by providing empirical evidence regarding cyber risk on trust and commitment to using banking services in North Sumatra Province.

Keywords: Cyber Attack, Indonesia Banks, Online Bank Usage, Transaction Risk.

INTRODUCTION

The banking sector is one of the areas most vulnerable to cyberattacks, along with the rapid growth of business and electronic transactions. Based on data from Bank Indonesia (BI), throughout 2023 the value of digital banking transactions in the country reached Rp4,264.8 trillion or nearly Rp4.3 quadrillion, which includes various digital banking transactions (Databooks, 2023). The development of financial technology in Indonesia has opened up opportunities to increase the number of financial organizations based on digital applications such as online banking, internet banking and mobile banking services, with data leakage and cyberattacks posing serious challenges. Based on a survey from the Financial Services Authority (OJK) which explains that banking losses reached IDR 246 billion due to cyberattacks, which reached 1,373 attacks on domestic banks in 2021. Then in early 2023 there were several cases of cyberattacks, one of which was the LockBit Ransomware attack

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on Bank Syariah Indonesia (BSI). The next cyberattack case was Bank Central Asia which reported that its customers lost money through Quick Response Code Indonesia Standard transactions (Galih 2020). According to previous research by (I. Bajwa, S. Ahmad, 2023) the factors that influence customer commitment in the use of banking services are the continuous use of banking services, strict cybersecurity measures taken by banks and customer perceptions of risk. If the online banking system does not provide a secure for, transactions then customers may be suspicious. Ultimately, this will weaken customer trust and commitment to the service, and usage will also be affected. Cyberattack Awareness is an event where bank customers are aware of the fact that their bank's cybersecurity has been breached. (I. Khan, Z. Hameed, 2017) in research conducted (Moh. Faqih Afghani1, 2017), and (I. Khan, Z. Hameed, 2017) on awareness shows that cyberattack awareness affects customer commitment to the use of banking services, so that financial institutions must take security measures on banking systems and quick recovery efforts in the event of an incident, strong security and transparency on the part of financial institutions can help minimize the impact of cyber awareness on commitment besides that it is necessary to communicate it to the public, especially customers either through email, web and other useful channels. In research conducted (Nakayama, 2017), (Daud et al., 2018), (M. Abuzaraida, A. Zeki, 2020) on cybersecurity Measures shows that cybersecurity measures affect customer commitment to the use of banking services based on account security and prevention of online fraud where customers rely on banks in storing their personal and financial data.

Negative assumptions from customers about the uncertainty and consequences that will be faced when someone makes an online transaction (Mauludiyah & Diana, 2018). In research conducted by (Rahim, 2017), (Daud et al., 2018), risk perception affects customer commitment in using banking services because customers tend to be committed to using banking services, 2018). Risk perception affects customer commitment to the use of banking services, because customers tend to be careful about their financial security if customers feel high security risks or feel unsafe when making transactions. This can affect customer commitment to these financial institutions. An important factor that can overcome difficulties between business partners and one of the important assets in developing long-term relationships, in this concept, customers believe that banking services are safe to use (Moh. Faqih Afghani1, 2017) in research conducted by (Halik, 2016) ,(Bajwa et al., 2023) shows that customer trust affects commitment, because to achieve customer commitment it is necessary to build strong customer trust, because the key to success in achieving customer commitment is trust, because trust is built through dimensions, namely the totality of good performance, using the correct work principles, the services provided are optimal, building a reputation and providing a sense of security to customers. This study introduces cyberattack awareness as a new factor in understanding customer behavior in online banking, thus contributing new insights to the existing literature. The study includes sections on literature review, hypothesis development, methodology, results, managerial implications, and concludes with a discussion.

METHODS

The population in this study were all banking customers in North Sumatra. The Lamshow sampling approach is used as a sample determination carried out where the sampling unit consists of one group. By using 5% and 10% alpa, the sample of this study was 100 – 385 respondents. The questionnaire was distributed 3 times using g-form (online form) for 2 months. From the questionnaires distributed to as many as 312 people and 35 who were rejected, the result was that the sample in this study had obtained as many as 277 respondents. In this study, researchers collected data by distributing questionnaires via Google Form online and offline which consisted of 3 questions for the Commitment to Banking Service Users variable (Y), 4 questions for the Cyberattack Awareness variable (X1) (Yuan et al, 2018), 3 questions for the Cybersecurity Measure (X2) variable (Chandio et al., 2017), 5 questions for the Transaction Risk Perception (X3) variable (Roy et al., 2012), 3 questions for the Online Banking Usage (X4) variable (Widanengsih, 2021). And 3 questions about the Customer Trust (Z) variable (Sekhon et al., 2010).

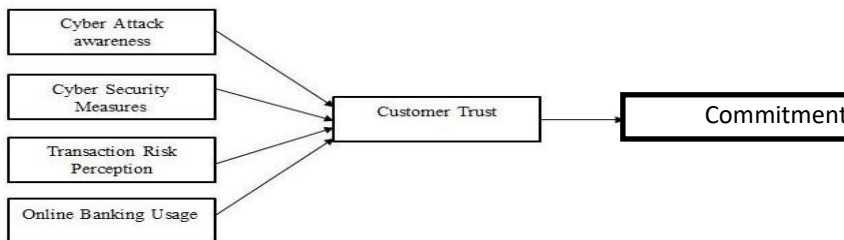
RESULTS


Figure 1 Structural Model

Respondent Characteristics Briefly describe

Based on the gender table, it shows that respondents with a male gender are 122 people (44.04%), which are dominated by female respondents as many as 150 people (55.96%). Thus, it can be concluded that the level of commitment to female banking service users in Medan City are more interested in using banking services than men. Based on age, it shows that respondents at ages 17-24 are 95 people (34.29%), ages 25- 32 are 82 people (29.6%), ages 33–40 years are 65 people (12.63%), and ages > 40 years are (12.63%). Thus, it can be concluded that people in North Sumatra with the use of banking services are dominated by ages 17–24 years. Based on education, it shows that respondents with a junior high school educational background are 40 people (14.44%), high school as many as 75 people (27.07%), S1 as many as 120 people (43.32%), S2 as many as 35 people (12.63%) and S3 as many as 7 people (2,5) Thus it can be concluded that people in North Sumatra in the use of banking services are dominated by people with S1 education level. Based on the length of use of banking services, it shows that respondents with a length of time using mobile banking <1 year were 56 people (20.21%), 1-2 years were 78 people (28.15%), 2–3 years were 85 people (30.68%), 3-4 years were 35 people (12.63%) and >5 years were 23

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people (8.3%). Thus, it can be concluded that people in North Sumatra using banking services are dominated by those who have used mobile banking for 2-3 years.

Table 1 Respondent characteristics

		Frequency	Percent
Gender	Male	122	44,04
	Famela	150	55,96
	Total	277	100
Age	17-24 Year	95	34.29
	25-32 Year	82	29.6
	33-40 Year	65	23.46
	>41 Year	35	12.63
	Total	277	100
Education	S3	7	2.52
	S2	35	12.63
	S1	120	43.32
	Senior High School	75	27.07
	Junior High School	40	14.44
	Total	277	100
Job	Student/Occupation	133	48.01
	Private Employee	47	16.96
	Civil servant	35	12.63
	Lecturer	15	5.41
	Soe Employee	47	16.96
	Total	277	100
Length of Use of Banking Services	< 1 Year	56	20.21
	1-2 Year	78	28.15
	2- 3 Year	85	30.68
	3-4 Year	35	12.63
	>5 Year	23	8.3
Total	277	100	
Bankingproducts used	ATM	130	46.93

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Mobile Banking	42	15.16
Both of them	105	37.9
Total	277	100

Source: research sources (2024)

The convergent validity test results of the instruments used in this study are seen from the factor loading and AVE values using factor analysis. In the first convergent validity test using Confirmatory Factor Analysis, it was found that several question items and dimensions did not meet the valid standards, namely having a factor loading value <0.7. Thus, all variables and dimensions that do not meet the validity criteria are not included in further testing (Hair et al., 2017). The indicators and dimensions included in further research are KLPP, CAA, CSM, TRB, and OBS. Outer model testing is again carried out using valid instruments. The result is that all question items and dimensions included in the test have a factor loading value > 0.7. This indicates that all items to be included in further testing have met convergent validity.

Table 2 Outer Loading

	Cyber Attack Awareness	Cyber Security Measure	Customers Trust	Komitmen	Online Banking Usage	Transaction Risk Perception
CAA1	0,883					
CAA2	0,819					
CAA3	0,766					
CSM1		0,927				
CSM2		0,944				
CSM3		0,762				
CT1			0,889			
CT2			0,902			
CT3			0,882			
KPPL1				0,917		
KPPL2				0,891		
KPPL3				0,936		
KPPL4				0,889		
OBU1					0,799	
OBU2					0,828	
OBU3					0,911	
TRP1						0,740
TRP2						0,875
TRP3						0,779

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TRP4	0,803
TRP5	0,891

Source: Smart PLS Data Processing Results (2024)

Based on table 4.9 Outer Loading states that each variable has a number ≥ 0.740 . Then all variables in each indicator are acceptable.

Discriminate Validity

Discriminate validity is used to test the validity of a model. To assess discriminant validity is cross-loading. You can examine cross-loadings to make this evaluation. Discriminate validity is established when the indicator load on the assigned construct is higher than all of its cross-loadings with other constructs. The standard value used for cross loading is >0.70 (Hair et al., 2017).

Tabel 3 Cross Loadings

	Customers Trust	CyberAttack Awareness	Cyber Security Measure	Komitmen	Online Banking Usage	Transaction Risk Perception
CAA1	0,817	0,883	0,599	0,714	0,677	0,768
CAA2	0,688	0,819	0,650	0,756	0,747	0,671
CAA3	0,592	0,766	0,597	0,707	0,546	0,715
CSM1	0,794	0,667	0,927	0,623	0,734	0,705
CSM2	0,858	0,818	0,944	0,801	0,802	0,905
CSM3	0,513	0,398	0,762	0,399	0,488	0,548
CT1	0,889	0,672	0,771	0,644	0,661	0,757
CT2	0,902	0,760	0,803	0,674	0,828	0,767
CT3	0,882	0,834	0,690	0,878	0,631	0,846
KPPL1	0,845	0,825	0,641	0,917	0,658	0,823
KPPL2	0,645	0,707	0,642	0,891	0,698	0,820
KPPL3	0,796	0,843	0,644	0,936	0,665	0,835
KPPL4	0,725	0,816	0,694	0,889	0,768	0,783
OBU1	0,588	0,626	0,558	0,615	0,799	0,604
OBU2	0,647	0,689	0,759	0,597	0,828	0,725
OBU3	0,761	0,717	0,685	0,725	0,911	0,805
TRP1	0,697	0,731	0,492	0,753	0,518	0,740
TRP2	0,749	0,786	0,697	0,869	0,807	0,875
TRP3	0,669	0,542	0,753	0,574	0,644	0,779
TRP4	0,700	0,729	0,720	0,762	0,798	0,803
TRP5	0,826	0,750	0,786	0,688	0,678	0,891

Source: Smart PLS Data Processing Results (2024)

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Based on the table above, it can be seen that the value of cross loadings for each indicator of each latent variable has a greater value when compared to the value of other latent variable indicators. For example, the comparison of cross loading values on all variables is > 0.70 . According to the above results, it can be seen that all latent variables already have good discriminant validity. Likewise, the other variables each correlate more strongly with the variable they measure. So it can be concluded that the discriminatory validity test has been fulfilled, and can be declared valid. Apart from using the loading factor value, the method that can be used to assess discriminant validity is to compare the square root value of the average variance extracted (AVE) of each construct with the correlation between the construct and other constructs in the model. To assess whether the construct measures discriminate well empirically. According to the Fornell-Lacker criterion, the square root of the AVE of each construct should be higher than the highest correlation of the construct with other constructs in the model (Hair et al., 2017). To see the square root value of AVE, it can be seen in the Fornell Lacker Criterion table

Tabel 4 Path Coefficient

	Original Sample (O)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values	Keterangan
Cyber Attack Awareness - >Commitment	0,397	0,080	4,954	0,651	Refused
Cyber Security Measure- >Commitment	-0,148	0,085	1,757	0,000	Received
Transaction Risk Perception>Commitment	0,634	0,090	7,070	0,000	Received
Online Banking Usage-> Commitment	-0,032	0,070	0,453	0,000	Received
Customers Trust ->Commitment	0,077	0,087	0,888	0,375	Refused
Cyber Attack Awareness - > Customers Trust -> Commitment	0,024	0,030	0,802	0,423	Refused
Cyber Security Measure-> Customers Trust -> Commitment	0,024	0,032	0,766	0,444	Refused
Online Banking	-0,002	0,007	0,252	0,801	

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Usage -> Customers Trust- >commitment	Refused
Transaction Risk Perception 0,029 0,031 0,938 0,349 -> Customers Trust -> commitment	Refused

Source: Smart PLS Data Processing Results (2024)

The first hypothesis tested in this study shows that Cyberattack Awareness has no effect on the commitment of banking services to the community in North Sumatra. It can be concluded that the first hypothesis in this study is rejected. The second hypothesis tested in this study shows that Cybersecurity Measures affect the commitment of banking services to the community in North Sumatra. It can be concluded that the second hypothesis in this study is accepted. The third hypothesis tested in this study shows that Transaction Risk Perception affects the commitment of banking services to the community in North Sumatra. It can be concluded that the hypothesis in this study is accepted. The fourth hypothesis tested in this study is to show that online banking use affects the commitment of banking services to the community in North Sumatra. It can be concluded that the hypothesis in this study is accepted. The fifth hypothesis tested in this study is to show that Customer Trust has no effect on the commitment of banking services to the community in North Sumatra. It can be concluded that the hypothesis in this study is rejected. The sixth hypothesis tested in this study is to show that Cyberattack Awareness has no effect on banking service commitment to public trust in North Sumatra. It can be concluded that the first hypothesis in this study is rejected. The seventh hypothesis tested in this study is to show that Cyber Measures Security has no effect on the commitment of banking services to the community in North Sumatra. It can be concluded that the first hypothesis in this study is rejected. The eighth hypothesis tested in this study is to show that Transaction Risk Perception has no effect on the commitment of banking services to the community in North Sumatra. It can be concluded that the first hypothesis in this study is rejected. The ninth hypothesis tested in this study is to show that Transaction Risk Perception has no effect on commitment to banking services in the community in North Sumatra. It can be concluded that the first hypothesis in this study is rejected.

DISCUSSION

Cyberattack Awareness Has No Effect on Commitment to Banking Service Users

The test results between commitment and Cyberattack Awareness obtained an original sample value of 0.397 with a t-statistic of 4.954 and a P value of 0.651. This value means that there is an influence and is not significant between Cyberattack Awareness and commitment to the community in North Sumatra. It can be proven that this hypothesis proves that cyberattack awareness is not something that makes commitment in banking services one of the factors that make people committed to using banking services. Cyberattack awareness

is not something that makes people in Medan city committed to banking services. Because people do not realize that their awareness of attacks in the online world is a real thing for us to be aware of in using mobile banking or other services. The results of this study are supported by research conducted (Daud et al., 2018). The results showed that the influence and insignificance of Cyberattack Awareness and commitment means that convenience is not a major factor in the use of banking services, even though consumers feel comfortable compared to not caring about cyberattacks that occur in banking services. Meanwhile, research conducted (Feline Cloramidine1, 2023) also examined measuring Indonesia's Cybersecurity through the Cooperation Pillar Indicators in the Global Cybersecurity Index (GCI), which stated that it had no effect. However, the results of this study are not in line with research conducted (Johri & Kumar, 2023) and (Trim & Lee, 2019). The results show that cyberattack affects the commitment of banking services.

Cybersecurity Measures Affect Commitment To Banking Service Users

The test results between commitment and Cybersecurity Measures obtained an original sample value of -0.148 with a t-statistic of 1.757 and P values of 0.000. This value means that there is an influence and significance between Cybersecurity Measures and commitment in the community in North Sumatra. Cyberattack awareness is not something that makes people in Medan city committed to banking services. Because people do not realize that their awareness of attacks in the online world is a real thing for us to realize in using mobile banking or other services. Cybersecurity measures are evidence that commitment to the use of banking services affects the commitment to the use of banking services in the community in North Sumatra. The community assesses security measures in the online world, especially in banking services, as the main thing to improve the quality of securing money for banking service products in the people of North Sumatra. The results of this study are supported by research conducted (Shyong & Lin, 2015), (Pham et al., 2021), and (M.Abuzaraida, A.Zeki, 2020). The results showed that the influence and significance between Cybersecurity Measures and commitment means that Cybersecurity measures are a major factor in the use of banking services, even though consumers feel comfortable compared to the care of cyberattacks that occur in banking services.

Transaction Risk Perception Affects Commitment To Banking Service Users

The test results between commitment and Transaction Risk Perception obtained an original sample value of 0.634 with a t-statistic of 7.070 and P values of 0.000. This value means that there is an influence and significance between Transaction Risk Perception and commitment to the community in North Sumatra. In the reception of the community in transaction risk on commitment to banking services is very influential. Because it makes people have to think about the impact or consequences that have occurred on banking services. If a bank has experienced transactional risk, people do not want to commit to the bank. From that, we can see that it is very influential on community reception in transactional

transactions at a bank, especially for people in North Sumatra. The results of this study are supported by research conducted (Rahim, 2017), (Nafisah & Dalimunte, 2023), and (Moh. Faqih Afghani1, 2017). The results showed that the influence and significance between transaction Risk, perception and commitment means that the perception of transaction risk is a major factor in the use of banking services, even though consumers feel comfortable in banking services, people know the risks of transactions in banking services.

Online Banking Usage Affects Commitment

The test results between commitment and Online Banking Usage obtained an original sample value of -0.032 with a t-statistic of 0.453 and P values of 0.000. This value means that there is an influence and significance between online banking use and commitment in the community in North Sumatra. That is, the use of services affects online use in the community in North Sumatra. Online banking usage affects the commitment of banking services. Because it can facilitate the public in transacting in these banking products. People in North Sumatra need to transact online because the transaction, if the transaction is done directly adrift, drains more time on which the average person is busy looking for his income. Therefore, using online banking makes it easier for people to use banking service products. The results of this study are supported by research conducted (Kaur & Arora, 2021), (Johri & Kumar, 2023), and (Moh. Faqih Afghani1, 2017). The results showed that there is a significant and significant influence between online banking use and commitment, which means that the ease of online transactions is a major factor in the use of banking services.

Customers Trust Has No Effect On Commitment

The test results between commitment and Customers Trust obtained an original sample value of 0.077 with a t-statistic of 0.888 and P values of 0.375. This value means that there is an influence and is not significant between Customers Trust and commitment to the community in North Sumatra. Customer trust does not necessarily make people committed to financial services. This happens because there are many things that must be considered besides public trust in the bank. Starting from the service, acceleration, and technology used to store money and customer data. So, consumer trust does not necessarily make these consumers committed to banking services. The results of this study are supported by research conducted (Nafisah & Dalimunte, 2023), (Aristyanto et al., 2019), and (Assegaff et al., 2017) customer results showed that the influence and insignificance between customer Trust and commitment means that convenience is not a major factor in the use of banking services, even though consumers believe.

Cyberattack Awareness Has No Effect On Commitment Through Customer Trust

The test results between commitment and Cyberattack Awareness through Customers Trust obtained an original sample value of 0.024 with a t-statistic of 0.802 and P values of 0.423. This value means that there is an influence and significance between

cyberattack and commitment in the community in North Sumatra. This means that the commitment of banking services to consumer confidence does not affect Cyberattack Awareness in the community in North Sumatra. The awareness of online attacks on the commitment of banking services with customer trust does not prove that people can commit to banking services. Online attack awareness is low because people do not realize that there is an online attack. If there is an online attack, the community will come to ask for banking accountability to return the funds that have been lost. Furthermore, the data that has been stolen by the community does not realize how important the data is. Public trust does not make a commitment to banking services. The results of this study are supported by research conducted (Trim & Lee, 2019). The results showed that the influence and insignificance between Cyberattack Awareness and commitment of consumer confidence means that convenience is not a major factor in the use of banking services, even though consumers feel comfortable compared to not caring about cyberattacks that occur in banking services.

Cybersecurity Awareness Does Not Affect Commitment To Banking Service Users Through Customer Trust

The test results between commitment and Cybersecurity Measures through Customer Trust obtained an original sample value of 0.024 with a t-statistic of 0.766 and P values of 0.444. This value means that there is an influence and insignificant between Cybersecurity Measures and commitment to the community in North Sumatra. This means that the commitment of banking services to consumer confidence does not affect Cybersecurity Measures in the community in North Sumatra. Public perception of online security does not break the commitment of banking services to public trust. The public perception of online security does not affect public trust or a person's commitment to using banking service products. This is because the perception of online security is less known in North Sumatra society, so public trust is not influenced by the perception of online security. The results of this study are supported by research conducted (Pham et al., 2021). The results showed that the influence and insignificance of Cybersecurity Measures and commitment to consumer confidence means that convenience is not a major factor in the use of banking services, even though consumers feel comfortable compared to not caring about cyberattacks that occur in banking services. Meanwhile, research conducted (Johri & Kumar, 2023) also examined Exploring Customer Awareness Towards Their Cybersecurity In The Kingdom Of Saudi Arabia: A Study In The Era Of Banking Digital Transformation states no effect.

Transaction Risk Perception Does Not Affect Commitment To Banking Service Users Through Customer Trust

The test results between commitment and Transaction Risk Perception through Customer Trust obtained an original sample value of 0.029 with a t-statistic of 0.938 and P values of 0.349. This value means that there is an influence and is not significant between Transaction Risk Perception and commitment to the community in North Sumatra. The risk

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in transactions in banking services in the community in North Sumatra states that it does not affect the commitment or trust of the community, and the perception of transaction risk is not considered important to the people of North Sumatra. This is due to the lack of knowledge of the risk of transactions, so this is not a factor that can affect public confidence in determining the banking services they choose. Moreover, to commit does not attach importance to the perception of transaction risk in community commitment through public trust in North Sumatra. The results of this study are supported by research conducted (Kurnianingsih & Hidayat, 2021). The results showed that the influence and insignificance between Transaction Risk Perception and commitment through consumer confidence means that ease of transaction is not a major factor in the commitment to using banking services, even though consumers feel comfortable compared to not caring about cyberattacks that occur in banking services. Meanwhile, research conducted (Rahim, 2017) also tested the Analysis of the Effect of Risk Perception and Trust on Transaction Interest of Payton Users at PT. Veritra Sentosa International stated that it had no effect.

Online Banking Usage Does Not Affect Commitment To Banking Service Users Through Customer Trust

The test results between commitment and Online Banking Usage through Customers Trust obtained an original sample value of -0.002 with a t-statistic of 0.252 and a P value of 0.801. This value means that there is an influence and an insignificant between Online Banking Usage and commitment in the community in North Sumatra. This means that the commitment of banking services to consumer confidence does not affect online banking use in the community in North Sumatra. The use of online mobile banking has been widely found in the community but cannot affect the commitment of banking services through public trust. Many other factors make people commit to and trust a product in banking services. The results of this study are supported by research conducted (Aiming & Purwantoro, 2020). The results showed that the influence and insignificance between online banking use and commitment to consumer confidence means that convenience is not a major factor in the use of banking services, even though consumers feel comfortable compared to not caring about cyberattacks that occur in banking services. Meanwhile, research conducted ((Firdous & Farooqi, 2017) also tested the Impact of Internet Banking Service Quality On Customer Satisfaction. It had no effect.

CONCLUSION

This research provides good insight into the relationship between trust and commitment in the context of banking customers in Indonesia, especially North Sumatra. By understanding the impact of cybersecurity education and communication, organizations can develop effective strategies to improve cybersecurity measures and strengthen customer relationships. The findings of this study can help organizations understand how to build and maintain trust in their customers. By emphasizing the importance of proactive

communication, transparency and robust incident response, organizations can establish themselves as trusted entities that prioritize customer information and transaction protection. Understanding the impact of cyberattack awareness on customer commitment can guide management in strengthening customer loyalty. By investing in cybersecurity measures and communicating these efforts to customers, organizations can generate confidence and encourage long-term commitment from their customer base. As banks have recently experienced cyber-attacks, it is now imperative that banks and regulators publicize the steps taken to enhance security through email, websites and other helpful channels to their customers. Governments and regulators, through coordinated efforts, should also ensure an overall improvement in customer confidence. Banks should invest in improving their corporate image. In summary, measures to improve security, privacy and the overall reputation of the institution will go a long way to restoring trust and long-term commitment. Due to privacy concerns, the bank did not disclose the identities of customers who were directly affected by the cyberattack. Although their accounts and cards were restored to their original form, they still experienced service issues for a short period of time. Therefore, if such customer data is made available in the future, and future research examines their perceptions through questionnaires, it will be a better representation of their opinions. Similarly, if detailed secondary data is made available by banks in the future, this could lead to interesting case studies regarding the analysis of cyberattacks in the financial sector. Finally, future research could expand the sample size and cover a more diversified population from all regions of the country.

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