The Effect of E-CRM on Customer Loyalty With Customer Satisfaction as a Mediation Variable
(Study of Users of BNI Direct South Sumatra)

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Abstract

This study aims to measure the effect of E-CRM on customer loyalty through customer satisfaction in 2021 by testing the variables of E-CRM, customer satisfaction, and customer loyalty using BNI Direct. The sample taken in this study amounted to 100 customers/debtors managed by BNI. Using PLS-SEM, the results show that the E-CRM variable contributes 58.7 % to BNI Direct customer satisfaction. This means that BNI Direct customer satisfaction can be explained through E-CRM activities carried out by BNI Direct. Furthermore, the variables of E-CRM and satisfaction contributed 67.6 % to BNI Direct customer loyalty substantially (powerfully). This means that BNI Direct customer loyalty can be explained through BNI Direct's E-CRM activities and the creation of customer satisfaction.

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1 Introduction

One of the significant influences of the internet network that continues to expand and develop is that companies and customers have many ways to communicate with one another; one of the industries that have had a significant impact on the change is the Ganguli banking industry (Larsson & Viitaoja, 2016).

Electronic Customer Relationship Management (E-CRM) assists banks in serving their customers and developing processes (Dehghanpouri, Soltani, & Rostamzadeh, 2015). Improvements in communication networks eliminate many problems and place electronic customer relationship management (E-CRM) is a revolutionary phenomenon in the banking

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industry. Therefore, companies use information technology (IT) based on CRM applications to help company strategy. According to Alwawan in (Al-Dmour et al., 2019).

Consumers will have a wide choice of banking products and services that may meet their needs. Customers will form expectations about the value and satisfaction of various market offerings (Kotler & Armstrong, 2017). Satisfied customers will buy again and tell others about their good experience. Dissatisfied customers often turn to competitors and disparage products to others (Kotler & Armstrong, 2017). According to Yi's research, attracting new customers is more expensive than keeping an existing one. The orientation of banks is to gain the loyalty of their customers because it is essential for business continuity with the given profit growth. Banks must satisfy the needs of their customers, Rootman (Al-Dmour, et al., 2019).

BNI carries BNI *Direct* as *internet banking* for its customers. In order to achieve customer loyalty, BNI has equipped it with features of mutation information, the printing of bank statements, transfers, *micro file uploads, multi transfers, tax payments*, Pertamina *ordering & payment solutions*, distribution of transaction authority consisting of *Maker, Approver and Releaser*, Transaction Authority Matrix and Limit Transactions, so transactions are safer.

Previous research that examined the effect of E-CRM on customer satisfaction, which was conducted (Prismantoro, 2020), showed that E-CRM had a positive and significant effect on customer loyalty. The study results (Marshellina & Prabowo, 2013) show that E-CRM does not affect customer loyalty. A business phenomenon is the increasing number of customers using BNI *Direct,* which is quite large, but the level of use decreases. This indicates that customer satisfaction of BNI *Direct users* is still not optimal, so it affects customer loyalty; besides that, there are still research gaps between one researcher and another on the effect of customer satisfaction on customer loyalty.

2   Materials and Methods

This research design is causal research that examines the cause and effect relationship between two or more variables, namely E-CRM, customer satisfaction, and loyalty. This research uses quantitative data and qualitative data. Quantitative data on the number of BNI *Direct users* and the number of customers who contact the BNI call center. At the same time, the qualitative data is the customer's perception of the performance of e-CRM, satisfaction, and loyalty.

Table 1. Variable Measurement

Variable	Indicator	Measurement Scale
e-CRM	1. Encouraging customers to share complaints 2. Customer needs are reviewed and responded to individually 3. Have personnel who support building customers utilizing technology. 4. The Bank has the right software to serve every customer 5. Customer complaints are reviewed and acted upon quickly	Semantic Differential Scale
Customer satisfaction	1. Satisfied with the services provided by the Bank 2. Satisfied with employee response and fast service online 3. Satisfied with advice in online financial services 4. The overall quality of online services provided by the Bank is excellent	Semantic Differential Scale
Customer loyalty	1. There is no intention to move to another bank. 2. Have the intention to recommend to others 3. We prefer this Bank over other banks. 4. Happy to use bank services. 5. Will use the new services offered by the Bank	Semantic Differential Scale

The population in this study were all customers using BNI *Direct* in the last three years 1,661. Therefore, a sample size of 100 customers who have used BNI *Direct services* in South Sumatra was determined based on the Slovin formula with an error margin of 10%. The *purposive sampling method* determines that only customers who have used BNI *Direct services* are eligible to be sampled.

The statements in the questionnaire are measured using a Likert measurement scale with a type of *semantic differential scale point* 5. The use of a *semantic differential scale* aims to obtain a more specific description of the responses given by the respondents.

The data analysis technique used in this research is *Partial Lease Square Structural Equation Modeling* (PLS-SEM). The PLS-SEM analysis consists of two measurement models, namely the measurement of the *outer model* (measurement model) and *the inner model* (structural model) (Hair et al., 2017). The measurement model shows how the manifest or

observed variables represent the latent variables to be measured, while the structural model shows the strength of the estimation between latent variables or constructs.

The measurement of the outer model is intended to analyze the validity and reliability of the question items in the questionnaire. Furthermore, the measurement of the inner model is intended to discuss hypothesis testing or model evaluation through the beta coefficient value, t-value, significant value, R-Square, F-Square, and Q-Square predictive relevance.

3   Results and Discussions

Characteristics of Respondents

Table 2. Characteristics of Respondents

Characteristics	Percentage
Customers from BNI branches	
King stone	6%
Great wood	7 %
Linggau	13 %
Palembang Music	27 %
Palembang	26 %
Prabumulih	21 %
Business Form	
Individual	3 %
Company	97 %
Long time using BNI Direct	
12 years old	77 %
3 – 4 years	14 %
More than four years	9 %
Using products such as BNI Direct from other banks	
Yes	91 %
No	9 %

Based on the recapitulation of the characteristics of the customers involved in the survey, it was found that the largest BNI Direct customers came from Musi Palembang (27%), Palembang (26%), and Prabumulih 21%. Average customers have a corporate form of business (97%) and have been BNI Direct customers for 1-2 years (77 %). Customers also use other products other than BNI Direct by 91%. In conclusion, even though customers have a loyal attitude towards BNI Direct services, they still use services from other banks such as Mandiri *Cash Management.*

Research Description Analysis

Table 3. Descriptive Research Variables

Statement	mean
E-CRM: Mean 4.31	
1. The Bank always encourages every customer to share their complaints	4.27
2. Each customer's needs are reviewed and responded to individually	4.36
3. The Bank has the right technical personnel to utilize computer technology to build relationships with customers	4.29
4. The Bank has the right software to serve every customer	4.32
5. Every customer complaint is reviewed and followed up quickly	4.35
Satisfaction: Mean = 4.34	
1. I am satisfied with the services provided by this Bank	4.39
2. I am satisfied with the employee response and fast service online	4.35
3. I am satisfied with the advice in online financial services	4.34

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4. Overall, the quality of online services provided by the Bank is excellent	4.31

Loyalty: Mean = 4.26

1. I have no intention of moving to another bank	4.19
2. I intend to give bank recommendations to others	4.36
3. I like this Bank more than other banks	4.22
4. I am happy to use this bank service	4.27
5. I will use every new service this Bank has to offer	4.30

Based on the table above, it is known that in all indicators on statements about E-CRM activities, customers have perceptions with an average score of more than 4. This means that most customers respond positively to the 5 statement items about E-CRM. Next, the second indicator is the highest compared to the other four indicators. This means that most customers view every need as being personally served by BNI Direct service staff. Furthermore, customers perceive all indicators on statements about satisfaction with service with an average score of more than 4. This means that most customers respond positively to the 4 statement items about satisfaction.

Furthermore, the first indicator is the highest compared to the other three indicators. This means that most customers are satisfied with the services provided by BNI Direct staff. Finally, customers perceive all indicators on the statement about loyalty with an average score of more than 4. This means that most customers respond positively to the 5 statement items about E-CRM. Next, the second indicator is the highest compared to the other four indicators. This means that most customers view every need as being personally served by BNI Direct service staff.

PLS-SEM Analisis Analysis

Outer Model Analysis

Table 4. Convergent Validity Test

Variable	Items	Loading Factor	AVE
E-COM	ECRM1	0.805	0.635
	ECRM2	0.813	
	ECRM3	0.808	
	ECRM4	0.805	
	ECRM5	0.751	
Satisfaction	KP1	0.828	0.648
	KP2	0.792	
	KP3	0.826	
	KP4	0.773	
Loyalty	LP1	0.770	0.625
	LP2	0.763	
	LP3	0855	
	LP4	0.765	
	LP5	0.794	

Based on the convergent validity test results, it is proven that all indicators in this study are declared valid. This is because all indicators produce a loading factor value greater than 0.70. Furthermore, the value of AVE (Average Variance Extracted) in each variable is more significant than 0.5. In conclusion, all convergent validity tests are met.

Furthermore, the third indicator is the most robust in explaining E-CRM activities because it has the most considerable loading factor value (0.808) of the other indicators. The first indicator reflects a strong indicator in explaining customer satisfaction having the most considerable loading factor value (0.828) of the other indicators. The third indicator is the strongest in explaining customer loyalty because it has the most considerable *loading factor value* (0.8 55) among other indicators.

Table 5. Discriminant Validity Test - Fornell-Larcker Criterion

	E-COM	Satisfaction	Loyalty
E-COM	**0.797**		
Satisfaction	0.769	**0.805**	
Loyalty	0.752	0.797	**0.790**

Based on the table above, it can be seen that the correlation value of E-CRM with its variable is more significant when it is correlated with other variables in the E-CRM column. That is, by using the Fornell-Larcker Criterion method, it is proven that all variables meet the requirements of *discriminant validity*.

Table 6. Reliability Test

	Cronbach's Alpha	Composite Reliability
E-COM	0.856	0.897
Satisfaction	0.819	0.880
Loyalty	0.849	0.892

Based on the table above, it can be seen that all the variables studied have a Cronbach Alpha value > 0.7. Likewise, the Composite Reliability value which produces a value greater than 0.7. Therefore, it can be concluded that all indicators used in the questionnaire are reliable or consistent in measuring the variables.

Inner Model

The test of the structural model or inner model aims to determine the relationship between constructs, significance value, *R-square* (R^2), *Q-square predictive relevance* (Q^2), and *f-square effect size* (f^2) from a research model. Analysis of the structural model in this study using *bootstrapping technique* in SmartPLS version 3.3 with a significance level of 0.05.

The structural model represents the relationship between the latent variables used in the study. The structural model in this study consists of 2 sub-structures. The first substructure is satisfaction E-CRM,→and the second substructure is → E-CRM → loyalty satisfaction. The following are the *algorithm* results and *bootstrapping calculations* for each variable in the structural model.
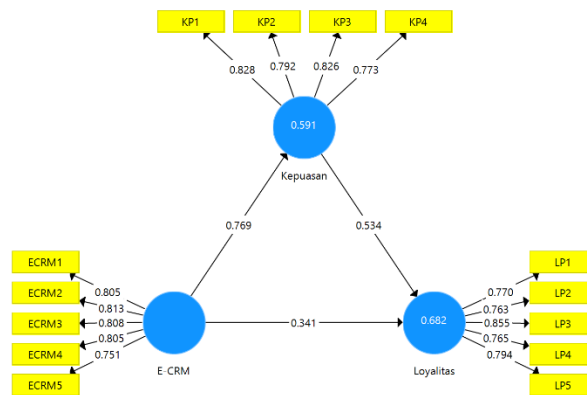

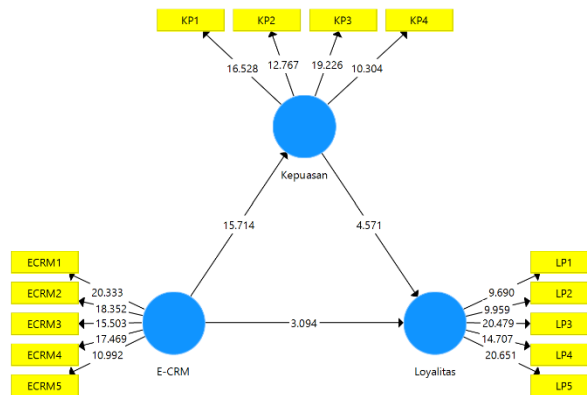**Figure 2. Results of the Full Research Model (Outer Model)**

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Figure 3. Results of the Full Research Model (Inner Model)

Based on Figure 2, it can be seen that the *R-Square value of* customer satisfaction is 0.591. E-CRM variability explains that 59.1 % of BNI Direct customer satisfaction is moderate. Furthermore, *the R-Square of* loyalty is 0.682. E-CRM variability and customer satisfaction explain 68.2 % of customer loyalty substantially (strong).

Q value two more significant than 0 (zero) indicates that the model has an excellent *predictive relevance* value. Based on the results of calculations using the blindfolding method, the *Q - Square value* of satisfaction is 0. 365, and *the Q Square* of loyalty is 0.407. The results of calculations using the blindfolding method are *predictive-relevance* values. The resulting satisfaction and loyalty are more significant than 0. Thus, the research model has an excellent *predictive relevance* value to explain satisfaction and loyalty.

The F-square value is used to determine the effect of exogenous variables on endogenous variables. Evaluation of the size of the value of $f2^{\,follows}$ the rules below

- The *f value of* $^{0.02-0.14\ is\ categorized\ as\ a\ weak\ influence\ of}$ exogenous variables at the structural level,
- The *f value of* $^{0.15-0.34\ is\ categorized\ as\ a\ moderate\ influence\ of}$ exogenous variables at the structural level,
- The *f value* of $> ^{0.35}$ is categorized as a strong influence of exogenous variables at the structural level.

Table 7. F-Square. Results

Track	F square	Effect Size
E-CRM → Satisfaction	1,448	Strong
E-CRM → Loyalty	0.150	Currently
Satisfaction → Loyalty	0.367	Strong

Based on the calculation results, it can be seen that the entire path of influence between exogenous and endogenous variables has a strong influence; only the influence of E-CRM on loyalty has a moderate influence in the structural model.

Measurement, The fit model uses the *Standardized Root Mean Square Residual* (SRMR) value, the standardized, average index between the observed correlation matrix and the hypothesis matrix. For the model to meet the model fit criteria, the SRMR value must be less than 0.8. The results of the calculation of the SRMR value in *the saturated model* of 0.07 4 < 0.8 and an NFI value of 0.807 < 0.9, meaning that the model fit criteria have been met if we look at the SRMR criteria, while the NFI value is accurate because it is < 0.9. So it can be concluded that the model fits the data.

Hypothesis test
The estimated value for the path relationship in the structural model must be significant. The *bootstrapping procedure* can obtain significant values. We see the significance of the hypothesis by referring to the parameter coefficient values and the T-statistical significance value on *bootstrapping reports*.

To find out whether it is significant or not, it can be seen from the T-table at an alpha of 0.05 (5%) = 1.96. Then the T-table is compared by T-count (T-statistics). The statistical estimation results are described as follows:

Table 4. 1 Path Coefficient Estimation Results and Statistical Test

Track	STD	Std Dev	T-stat	Sig.	Decision
E-CRM → Satisfaction	0.769	0.049	15,714	0.000	H1 Accepted
E-CRM → Loyalty	0.341	0.110	3.094	0.002	H2 Accepted
Satisfaction → Loyalty	0.534	0.117	4,571	0.000	H3 Accepted
E-CRM → Satisfaction → Loyalty	0.411	0.100	4097	0.000	H4 Accepted

Hypothesis 1 being tested is the effect of E-CRM on customer satisfaction of BNI Direct. Based on the calculation results summarized in the path coefficient estimation table and statistical tests, it can be seen that the E-CRM path coefficient on customer satisfaction is 0.769 in a positive direction. Next the value of Sig. 0.00 0 < 0.05, so the first hypothesis is accepted. E-CRM has a positive and significant effect on customer satisfaction of BNI Direct.

Hypothesis 2 being tested is the effect of E-CRM on customer loyalty BNI Direct. Based on the calculation results, it can be seen that the coefficient of the E-CRM path on customer loyalty is 0.341 in a positive direction. Next the value of Sig. 0.00 2 < 0.05, so the second hypothesis is accepted. E-CRM has a positive and significant effect on customer loyalty BNI Direct (Usman, Musa, & Jalal, 2012).

Hypothesis 3 tested is the effect of satisfaction on customer loyalty BNI Direct. Based on the calculation results, it can be seen that the path coefficient of satisfaction on customer loyalty is 0.534 in a positive direction. Next the value of Sig. 0.00 0 < 0.05, so the third hypothesis is accepted. Satisfaction has a positive and significant effect on customer loyalty to BNI Direct (Ibojo & Asabi, 2015).

Hypothesis 4 tested is the effect of E-CRM on loyalty through satisfaction BNI Direct customers. Based on the calculation results, the path coefficient value of the indirect effect of E-CRM on loyalty through satisfaction is 0.411 with a positive direction. Next the value of Sig. 0.000 < 0.05, so the fourth hypothesis is accepted. This means that satisfaction is proven to mediate the effect of E-CRM on BNI Direct customer loyalty.

Discussion of Research Results

Variable E-CRM contributed 58.7 % to BNI Direct customer satisfaction moderately. This means that BNI Direct customer satisfaction can be explained through E-CRM activities carried out by BNI Direct. Furthermore, the variables of E-CRM and satisfaction contributed 67.6 % to BNI Direct customer loyalty substantially (powerfully). This means that BNI Direct customer loyalty can be explained through BNI Direct's E-CRM activities and customer satisfaction creation.

E-CRM variable has predictions that are relevant to explaining satisfaction. Furthermore, E-CRM and satisfaction have relevant predictions to explain BNI Direct customer loyalty. Overall, the research model has good relevant predictions because the value of $Q2^{is}$ partially and simultaneously greater than 0.

Variable E-CRM has a strong influence on customer satisfaction. Meanwhile, it has a moderate effect when associated with customer loyalty. Lastly, satisfaction has a strong influence on BNI Direct customer loyalty.

Electronic Customer Relationship Management (E-CRM) uses digital communication technology to maximize sales to current customers and encourage repeat purchases through online services, including databases, personalized web messages, customer service, email, and social media marketing (Kingsnorth, 2003). 2016). E-CRM Based on the f-square (f^2) results, E-CRM strongly influences BNI Direct customer satisfaction. This explains that BNI's E-CRM will affect BNI Direct customer satisfaction in South Sumatra. This is in line with the results of research by Al-Dmour et al., (2019), which explains that E-CRM has a significant positive effect on Customer Satisfaction, as well as research conducted by Emaluta et al., (2019) where the research results also show the effect of E-CRM on customer satisfaction.

The average value for the E-CRM variable is 4.31; the highest average indicator value is found in the question "Each customer's needs are reviewed and responded to individually," with a value of 4.36; based on this, the Bank has provided optimal individual services to its customers, namely by appointing a customer manager, so that all customer needs can be met more personally.

If appropriately managed, e-CRM can provide efficient customer service, leading to more robust and intimate relationships with customers. This will increase their loyalty and reduce customer defection (Usman, Musa, & Jalal, 2012). Based on the results off-square (f^2), E-CRM has a moderate effect on customer loyalty to BNI Direct. This explains that BNI's E-CRM can affect BNI Direct customer loyalty. This is in line with Fitriana's research (2018) results, which state that E-CRM has a significant effect on E-Loyalty. This is also in line with Anuriza & Kusumawardhani's (2021) research, where E-CRM affects customer loyalty.

The average value for BNI Direct customer loyalty variable is 4,26. The highest average indicator value is found in the question "I intend to give bank recommendations to others," with a value of 4.36; for this, the Bank has given a sense of trust to its customers so that they do not hesitate to do so offer BNI Direct to others.

Ibojo & Asabi (2015) suggest that in the service industry, attention to service and customer satisfaction is considered a 'given' factor, which is expected and is a natural part of day-to-day operations. Service organizations cannot survive without satisfied customers. Customer satisfaction will pave the way. Based on the results off-square (f^2), satisfaction strongly influences customer loyalty to BNI Direct. This explains that the more satisfied BNI Direct customers are, the more loyal these customers are. This aligns with Chung et al., (2015) research that customer satisfaction positively affects customer loyalty in various sectors. As well as research conducted by Mohsan et al., (2011). The results reveal that customer satisfaction is positively correlated with customer loyalty.

The average value for the customer satisfaction variable is 4,34. The average value of the highest indicator is found in the question "I am satisfied with the services provided by this bank," for which the Bank has provided services that follow the expected value desired by customers.

Azila and Noor (2012) confirmed that the relationship between e-CRM and customer loyalty means that the more satisfied customers repurchase and spread positive word of mouth about the service provider, the higher the customer perceives a longer relationship, trust, and commitment with service providers. Based on the mediation test results, satisfaction can significantly mediate between E-CRM and BNI Direct customer loyalty. This explains that the Bank's E-

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CRM affects customer loyalty through BNI Direct customer satisfaction. This is in line with research conducted by Primantoro (2020), which explains that E-CRM affects Customer Loyalty through Customer Satisfaction as a complete mediation. Research by Ramadonna et al., (2019) shows that customer satisfaction variables can mediate Customer Relationship Management and BPR Rangkiang Aur Customer Loyalty.

4 Conclusion

Based on data processing results with PLS-SEM, it is evident that all research hypotheses are accepted. Therefore, this study concludes that: E-CRM has a positive and significant direct effect on BNI Direct customer satisfaction. E-CRM has a direct and positive effect on BNI Direct customer loyalty. Satisfaction has a positive and significant direct effect on customer loyalty BNI Direct. E-CRM has a positive and significant indirect effect on loyalty through BNI Direct customer satisfaction.

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