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Validity and Reliability of Customer Loyalty Instruments at Bank Jatim Sub-Branch Karangjati Ngawi

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Abstract

This study aims to assess the accuracy of the questionnaire measuring the customer loyalty instrument at Bank Jatim Sub-Branch Karangjati Ngawi using validity and reliability tests. The validity assessment is conducted to ascertain whether the questions on the questionnaire measure what is to be measured. The purpose of the reliability test is to gauge how trustworthy or dependable the questionnaire is. In this study, partial least squares (PLS) analysis is used to analyze data utilizing quantitative research methodologies. The study's sample used probabilty sampling using simple random sampling method as many as 46 respondents. Method of gathering data using a questionnaire. The findings indicate the validity value in the loading factor parameter in accordance with the criteria above 0.70. With AVE parameters (convergent validity) in accordance with the criteria above 0.50, and with discriminant parameters (Fornell Lacker, HTMT, cross loading) showing in accordance with the criteria below 0.90. Then the reliability value in all parameters (Croncbach's alpha and composite reliability) also shows in accordance with the criteria above 0.70. Thus this study proves that the questionnaire used to measure the level of customer loyalty at Bank Jatim Sub-Branch Karangjati Ngawi is valid and reliable.

Keywords: *Validity, Reliability, Customer Loyalty*

INTRODUCTION

The remarkable growth of Indonesian banking has caused competition between banks to become increasingly fierce, one of which is Bank Jatim. As one of the largest regional development banks, Bank Jatim realizes the importance of establishing relationships with customers. One of the key elements in the banking sector is customer loyalty. In connection with the context of customer loyalty, it is necessary to have a supportive service quality from a company. A service quality is an intangible, non-property act or performance performed by one party on behalf of another. (Supriyanto et al., 2021). In providing services, banks must fulfill at least five service quality indicators to retain customers, namely tangibles, reliability, responsiveness, assurance, empathy (Parasuraman et al, 1988).

Another factor that supports the level of customer loyalty is the application of digital banking. The purpose of digital banking services is that customers can carry out banking activities independently by utilizing electronic means (Setiawan, et al, 2020). In this digital era, banks are increasingly dependent on digital-based services (digital banking) to provide convenience and comfort for customers. High-quality service, a satisfactory digital experience, and strong customer trust in the bank are anticipated to enhance customer satisfaction, ultimately influencing their loyalty towards the bank.

These factors cannot be measured directly to respondents, however they can be measured with instruments. As a result, a validity test is required to demonstrate that each instrument accurately measures its factors, and a reliability test is required to assess how reliable the data measuring equipment is. In accordance with the preceding explanation, this study will evaluate the instrument's validity and assess the reliability of the questionnaire regarding customer loyalty at Bank Jatim Sub-Branch Karangjati Ngawi.

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The study's objective is to examine the validity and reliability of the constructs of service quality, digital banking, and trust in relation to customer loyalty, with customer satisfaction as an intervening variable at Bank Jatim Sub-Branch Karangjati Ngawi.

LITERATURE REVIEW

Service Quality

Service quality is a customer's assessment on how well a service meets their expectations. Parasuraman et al. (1988), according to the SERVQUAL framework, the aspects of service quality comprise reliability, tangibles, assurance, responsiveness and empathy. High service quality can increase customer satisfaction and ultimately has the potential to increase customer loyalty.

According to Itsnaini (2024), service quality affects customer loyalty. Meanwhile, according to Maryamah et al. (2023), customer loyalty is greatly impacted by relationship marketing, service excellence, and m-banking use all at once.

Digital Banking

Digital banking refers to banking services conducted through digital platforms, such as mobile applications, internet banking, and others. The purpose of digital banking services is that customers can carry out banking activities independently by utilizing electronic means (Setiawan, 2020). The adoption of digital has an impact on how consumers communicate with banks and may influence their loyalty and level of satisfaction. Yusuf et al. (2023) assert that digital banking exerts a substantial impact on client loyalty. Meanwhile, according to Itsnaini (2024), digital banking has an effect on customer loyalty. Meanwhile, according to Rahmawati (2024), digital banking plays a substantial role in influencing customer loyalty.

Trust

According to Kotler & Keller (2009), trust may be based on knowledge and opinion. Trust has also been demonstrated to encourage individuals to utilise a product or service by diminishing any uncertainty they may have held. Customer trust can thus be regarded as a type of emotional reflection in trade. This corresponds to the target product turnover or service utilisation rate, as well as the suitability of goals and actual results (Kotler, P. & Keller, 2009).

In the context of electronic banking, trust assumes significant importance when users have confidence in the banking institutions that support such services. The presence of trust fosters the anticipation of benefits and a sense of security during transactions, thereby encouraging users to engage with the system.

According to Fitriyah & Susana (2023), trust exerts a substantial influence on customer satisfaction. Conversely, Izzi et al. (2024) have asserted that trust exerts a favorable and noteworthy impact on client loyalty.

Customer Satisfaction

According to Kotler and Armstrong (2014), satisfaction is defined as a product or service's degree of performance that meets or exceeds expectations. If the product or service performance falls short of expectations, it can be deduced that the consumer will not be satisfied. Customer satisfaction can therefore be considered as the outcome of contrasting the actual situation with the expectations of the customer experienced by the consumer during interaction with banking services. This satisfaction thus serves as a connection between client loyalty and service quality.

According to the data, happy clients are more inclined to stick with the bank's goods and services. Customer satisfaction is shaped by the quality of service, the experience associated with using digital banking, and the level of trust in the bank. The satisfaction of a customer is frequently regarded as a fundamental determinant of customer loyalty.

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Customer Loyalty

As defined by Kotler and Keller (2016), customer loyalty refers to a strong and enduring commitment to repeatedly purchase or continue using a preferred product or service over time, despite external circumstances or marketing efforts that may encourage switching behavior. Rusdarti (2004) identifies rebuy, retention and referral as indicators in measuring customer loyalty. Singh (Rusdarti, 2004) further expands on this by including additional indicators of consumer loyalty, namely the percentage of purchases, frequency of visits, and recommendations to others.

METHOD

This study utilised primary data obtained through a questionnaire disseminated via Google Forms. The questionnaire was distributed to 46 respondents, who were customers who were registered active users of mobile banking at Bank Jatim Sub-branch Karangjati Ngawi. Sampling was conducted using probability sampling, employing the simple random sampling method.

The questionnaire is divided into five sections, namely digital banking, service quality, trust, customer loyalty and customer satisfaction. Instruments are utilised to construct part of the question description. The responses to the questionnaire are then tabulated using a Likert scale, with 1. Strongly Disagree, 2. Disagree, 3. Neutral, 4. Agree, and 5. Strongly Agree.

The data analysis is processed using the SmartPLS reflective model (Hair et al., 2019). The outer model is implemented to evaluate the model's validity and reliability. The loading factor value of the variable measuring indicator serves as the foundation for the model's validity. The model's reliability was assessed through multiple indicators, including Cronbach's Alpha, Composite Reliability, AVE, and Discriminant Validity (Fornell, Lacker, HTMT, and Cross Loadings). (Hair et al, 2019)

Table 1. Criteria Analysis

Testing	Parameter	Rule of Thumb
Validity	Outer Loading -Loading factor	> 0,70
Reliability	Croncbach's Alpha	> 0,70
	Composite Reliability	> 0,70
	AVE (Convergent Validity)	> 0,50
	Discriminant Validity Fornell Lacker HTMT Cross Loadings	 The square root of the Average Variance Extracted (AVE) for each variable exceeds the inter-variable correlations. below 0.90 all Xn variables should correlate higher with Xn variables and correlate lower than other variables

Source: Partial Least Square (Hair et al, 2019)

RESEARCH RESULTS AND DISCUSSION

Result

The findings derived from the data analysis presented are processed data obtained from the outer model test using SmartPLS 4.0. The measurement model employed in this study is reflective in nature, wherein the constructs of service quality, digital banking, trust, customer satisfaction, and customer loyalty are assessed using reflective indicators. In Hair et al (2019), The assessment of the reflective measurement model includes evaluating indicator loadings (Loading Factor > 0.70), Composite Reliability (> 0.70), Cronbach's Alpha (> 0.70), Average Variance Extracted (AVE > 0.50),

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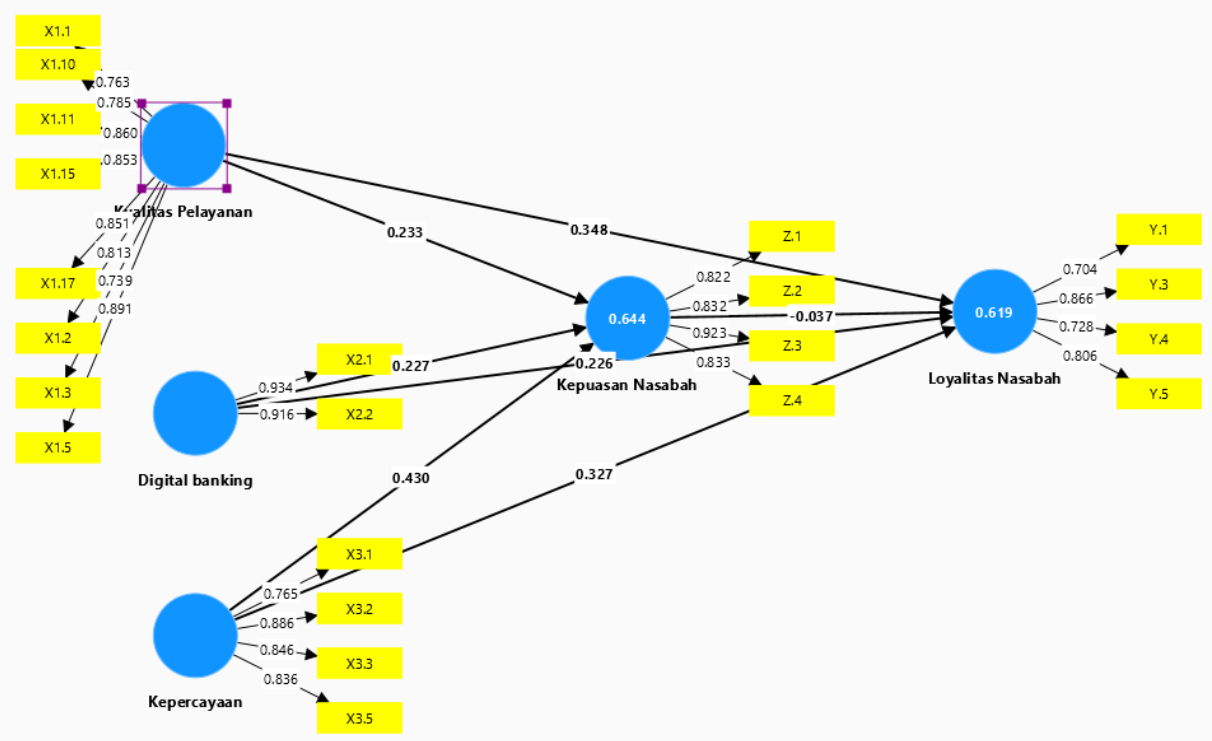
and an analysis of discriminant validity. Evaluation of discriminant validity involves the application of the Fornell-Larcker criterion, ensuring that the HTMT (Heterotrait-Monotrait Ratio) values remain below 0.90, as well as an examination of cross-loadings (all Xn variables should correlate higher with Xn variables and correlate lower than other variables) to confirm that each indicator loads more highly on its associated construct than on others.



***Source**: The result of SmartPLS 4.0 output*

Figure 1. Outer Model Test Scheme

Validity Test

Table 2. outer loadings

Outer loadings - Matrix

	Digital banking	Kepercayaan	Kepuasan Nasabah	Kualitas Pelayanan	Loyalitas Nasabah
X1.1				0.763	
X1.10				0.785	
X1.11				0.860	
X1.15				0.853	
X1.17				0.851	
X1.2				0.813	
X1.3				0.739	
X1.5				0.891	
X2.1	0.934				
X2.2	0.916				
X3.1		0.765			
X3.2		0.886			
X3.3		0.846			
X3.5		0.836			
Y.1					0.704
Y.3					0.866
Y.4					0.728
Y.5					0.806
Z.1			0.822		
Z.2			0.832		
Z.3			0.923		
Z.4			0.833		

***Source**: The result of SmartPLS 4.0 output*

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The concept of validity is founded upon the loading factor value of the measuring indicator variable. To ascertain the validity of the loading factor value on an indicator variable, a test procedure is conducted to evaluate the value above 0.7 as a threshold criteria. Subsequent to the validity analysis, it was confirmed that the outer loadings for the variables—service quality, digital banking, trust, customer satisfaction, and customer loyalty—surpassed the required threshold, thereby affirming the validity of the measurement instruments used in the study.

The Test of Reliability

Table 3. Reliability and Convergent Validity Indicators: Cronbach's Alpha, Composite Reliability, and Average Variance Extracted (AVE)

Construct reliability and validity - Overview — Copy to Excel/Word

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
Digital banking	0.832	0.840	0.922	0.856
Kepercayaan	0.853	0.858	0.901	0.696
Kepuasan Nasabah	0.876	0.887	0.915	0.729
Kualitas Pelayanan	0.930	0.934	0.943	0.674
Loyalitas Nasabah	0.785	0.813	0.860	0.607

***Source**: The result of SmartPLS 4.0 output*

In this study, the reliability of the variables is examined through the utilisation of various reliability measures. The assessment includes Cronbach's Alpha, Composite Reliability, Average Variance Extracted (AVE), as well as Discriminant Validity measures, comprising the Fornell-Larcker criterion, HTMT ratio, and Cross Loadings). The selection of these measures is guided by the criteria outlined by Hair et al. (2019), where Average Variance Extracted (AVE) must be greater than 0.5, Composite Reliability must be greater than 0.7, and Cronbach's Alpha must be greater than 0.7. The reliability analysis test is subsequently conducted, resulting in the determination of Cronbach's Alpha values higher than 0.7 for the digital banking, service quality, trust, customer loyalty, and customer satisfaction variables. Furthermore, composite reliability values exceeding 0.7 areobserved for all variables, along with AVE values that also surpassed 0.7. Consequently, it can be concluded that all instruments employed in this study are reliable.

According to the Fornell and Larcker criterion, discriminant validity is confirmed when the square root of the Average Variance Extracted (AVE) for each construct is greater than its correlations with any other construct in the model. Additionally, the HTMT (Heterotrait Monotrait Ratio) is employed, with a value below 0.90 indicating acceptable validity. Cross loadings are also considered, with the principle that all X1 variables must correlate higher with X1 and lower with other variables.

Table 4. Fornell-Larcker Criterion

Discriminant validity - Fornell-Larcker criterion

	Digital banking	Kepercayaan	Kepuasan Nasabah	Kualitas Pelayanan	Loyalitas Nasabah
Digital banking	0.925				
Kepercayaan	0.587	0.834			
Kepuasan Nasabah	0.664	0.744	0.854		
Kualitas Pelayanan	0.790	0.774	0.745	0.821	
Loyalitas Nasabah	0.668	0.701	0.615	0.752	0.779

***Source**: The result of SmartPLS 4.0 output*

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Discriminant validity should be assessed based on the guidelines proposed by Fornell and Larcker. Discriminant validity refers to a methodological evaluation designed to verify that constructs are conceptually distinct and supported by empirical evidence through rigorous statistical testing. The criterion proposed by Fornell and Larcker stipulates that the square root of the Average Variance Extracted (AVE) for each construct must be greater than its correlation with any other construct. Based on the results obtained, this condition has been met, thereby confirming that the discriminant validity of all constructs is satisfactorily established.

Table 5. HTMT

Discriminant validity - Heterotrait-monotrait ratio (HTMT) - Matrix

	Digital banking	Kepercayaan	Kepuasan Nasabah	Kualitas Pelayanan	Loyalitas Nasabah
Digital banking					
Kepercayaan	0.693				
Kepuasan Nasabah	0.761	0.851			
Kualitas Pelayanan	0.897	0.862	0.816		
Loyalitas Nasabah	0.786	0.825	0.687	0.852	

***Source**: The result of SmartPLS 4.0 output*

Hair et al. (2019) recommend discriminant validity as measured by the Heterotrait-Monotrait Ratio (HTMT), citing its superior sensitivity and accuracy in detecting such validity. Henseler et al. (2015) introduced the Heterotrait-Monotrait ratio (HTMT) as a more reliable criterion for assessing discriminant validity, asserting that a value below 0.90 indicates adequate distinction between two reflective constructs. The test results reveal that the HTMT value for the variable pair is less than 0.90, thereby demonstrating the presence of discriminant validity. This is indicated by the variable effectively dividing the variance of the measurement item, relative to that of the item which measures it, to a greater extent than it divides the variance observed in any other variable.

Table 6. discriminant validity- cross loadings

Discriminant validity - Cross loadings

	Digital banking	Kepercayaan	Kepuasan Nasabah	Kualitas Pelayanan	Loyalitas Nasabah
X1.1	0.549	0.565	0.617	0.763	0.507
X1.10	0.605	0.624	0.593	0.785	0.632
X1.11	0.767	0.563	0.648	0.860	0.660
X1.15	0.696	0.616	0.504	0.853	0.646
X1.17	0.627	0.809	0.690	0.851	0.729
X1.2	0.607	0.617	0.629	0.813	0.549
X1.3	0.618	0.512	0.547	0.739	0.542
X1.5	0.714	0.738	0.648	0.891	0.642
X2.1	0.934	0.543	0.669	0.752	0.632
X2.2	0.916	0.543	0.552	0.708	0.604
X3.1	0.481	0.765	0.590	0.674	0.489
X3.2	0.430	0.886	0.659	0.598	0.523
X3.3	0.430	0.846	0.568	0.560	0.641
X3.5	0.605	0.836	0.660	0.744	0.668
Y.1	0.434	0.395	0.282	0.576	0.704
Y.3	0.605	0.598	0.520	0.634	0.866
Y.4	0.288	0.439	0.352	0.396	0.728
Y.5	0.654	0.685	0.672	0.676	0.806
Z.1	0.600	0.662	0.822	0.664	0.685
Z.2	0.423	0.540	0.832	0.553	0.373
Z.3	0.601	0.676	0.923	0.682	0.526
Z.4	0.606	0.636	0.833	0.623	0.460

***Source**: The result of SmartPLS 4.0 output*

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As illustrated in Table 6, the service quality indicators X1.1, X1.2, X1.3, X1.5, X1.10, X1.11, X1.15, and X1.17 demonstrate stronger correlations with the overarching service quality construct than with any other constructs. This suggests that these indicators are effective and reliable measures of the service quality dimension. In contrast, the constructs related to digital banking, trust, customer loyalty, and customer satisfaction are captured with comparatively lower precision by their respective indicators. As demonstrated in the above table, discriminant validity with cross loading of all variables is achieved.

Discussion

Validity Test

Table 7. Outer Loadings, Composite Reliability dan AVE (Average Variance Extracted)

Variables	Measure-ment Items	Indicators	Outer Loadings	Cronbach's Alpha	Composite Reliability (rho_c)	AVE
Service quality	X1.1	Keeping promises	0,763	0,930	0,943	0,674
	X1.2	Delivering services right from the start	0,813			
	X1.3	Providing services in accordance with the promised time	0,739			
	X1.5	Employees are always willing to provide information	0,891			
	X1.10	brochure or account looks attractive	0,785			
	X1.11	Employees are able to answer questions	0,860			
	X1.15	Having convenient operating hours for everyone.	0,853			
	X1.17	prioritizing the interests of customers	0,851			
Digital Banking	X2.1	Internet banking menu is easy to learn and understand	0,934	0,832	0,922	0,856
	X2.2	Mobile banking supports several service features such as loans, payments, transactions (QRS, Bi Fast transfers), as well as ease of E-commerce purchases).	0,916			
Trust	X3.1	Security guarantee of the electronic banking system	0,765	0,853	0,901	0,696

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		(there is a Bank key for password verification).				
	X3.2	Receiving facilities in accordance with what the company has explained about electronic banking.	0,886			
	X3.3	Not feeling lied to about the facilities and benefits of electronic banking.	0,846			
	X3.5	Electronic banking can provide maximum benefits according to the needs	0,836			
Customer Loyalty	Y1	Repurchasing products and making transactions again	0,704	0,785	0,860	0,607
	Y3	recommending products and services to others	0,866			
	Y4	Is not interested in products offered by other banks	0,728			
	Y5	remaining a loyal customer	0,806			
Customer Satisfacti-on	Z1	satisfied with m-banking service	0,822	0,876	0,915	0,729
	Z2	satisfied with the efficiency of m-banking	0,832			
	Z3	satisfied with the effectiveness of m-banking	0,923			
	Z4	satisfied using m-banking because it is convenient	0,833			

***Source**: The result of SmartPLS 4.0 output*

The service quality construct is measured using eight validated indicators, each demonstrating satisfactory outer loading values ranging from 0.739 to 0.891. These results confirm that all eight items are valid measures of the underlying service quality construct. Furthermore, the construct's reliability is affirmed by a high Cronbach's Alpha of 0.930 and a Composite Reliability (CR) value of 0.943, both surpassing the recommended threshold of 0.70, thereby indicating strong internal consistency and measurement reliability. The model demonstrates adequate convergent validity, as evidenced by an Average Variance Extracted (AVE) value of 0.674, which exceeds the commonly accepted threshold of 0.50 (Fornell & Larcker, 1981). The cumulative variance of the measurement items contained within the variables is 67.4%.

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Among the eight measurement items, measurement items X1.5 and X1.11 have the highest outer loadings (0.891) and (0.860), which indicates that these two measurement items—related to employees always being willing to provide information and employees being able to answer questions—are performing very well at Bank Jatim Sub-Branch Karangjati Ngawi. Service quality is clearly reflected in how employees always provide the information needed by customers and are willing to answer customer questions. The SERVQUAL dimensions of service quality include tangibles, assurance, responsiveness, empathy, and dependability, which is consistent with Parasuraman et al. (1988). In this case, it refers to reliability (the bank's ability to consistently deliver promised services) and assurance (the expertise and capability of staff in providing solutions and ensuring customer security). Meanwhile, the measurement items that are performing well but still need acceleration for improvement are measurement items X1.3 (providing services within the promised time) and X1.1 (keeping promises), which have outer loadings of 0.739 and 0.763, respectively.

In this research, the digital banking construct is assessed using two validated indicators, each demonstrating strong outer loading values ranging from 0.916 to 0.934. These findings indicate a strong correlation between the two items in explaining digital banking. The reliability of the digital banking construct is considered satisfactory, supported by a Cronbach's alpha of 0.832 and a composite reliability of 0.922, both of which surpass the commonly accepted threshold of 0.70, indicating internal consistency. Convergent validity is demonstrated by an Average Variance Extracted (AVE) value of 0.856, which notably exceeds the recommended minimum threshold of 0.50, as suggested by Fornell and Larcker (1981). The digital banking menu is considered to be more straightforward to learn and understand, as indicated by X2.1 (LF = 0.934). This finding aligns with the theory that the ease of learning and use of mobile banking services directly influences customer desire to engage with them (Hadi & Novi, 2015). Additionally, Iqbal et al. (2021) assert that convenience and the availability of features significantly influence individuals' adoption and usage of mobile banking services.

The trust construct is assessed using four validated measurement items, each exhibiting outer loading values ranging from 0.765 to 0.886, indicating acceptable indicator reliability, indicating the validity of the four items in reflecting trust.The variable reliability level is considered acceptable, as evidenced by Cronbach's Alpha (0.853) and Composite Reliability (0.901), both exceeding 0.70 (reliable). An Average Variance Extracted (AVE) value of 0.696, which exceeds the benchmark of 0.50, confirms that the convergent validity of the construct is adequately established. The cumulative variance of the measurement items contained within the variables is 69.6%. Among the four measurement items, X3.2 and X3.3 have the highest outer loading (0.886) and (0.846), respectively. These findings suggest that the two measurement items, which inquire about customers' perceptions of facilities in accordance with the company's explanations of electronic banking and whether customers feel deceived by the facilities and benefits of electronic banking, have demonstrated robust performance at Bank Jatim Sub-Branch Karangjati Ngawi. This finding aligns with the findings of Steth (2004) in Rinjani (2020), which indicate that customer trust (*Y*) is measured using five indicators: security systems, honoring commitments, ensuring customers are not misled, trust, and providing benefits. Conversely, measurement item X3.1 (security guarantee of the electronic banking system) has an outer loading of 0.765, indicating that while it is satisfactory, further enhancement is necessary to optimise its performance.

The construct of customer loyalty is assessed using four validated indicators, each demonstrating outer loading values between 0.704 and 0.866. These values reflect a strong and consistent association among the items, underscoring their effectiveness in representing the underlying concept of customer loyalty. The reliability of the customer loyalty construct is deemed satisfactory, as evidenced by a Cronbach's Alpha of 0.853 and a composite reliability score of 0.901. Both metrics surpass the commonly accepted threshold of 0.70, thereby confirming the internal consistency and reliability of the measurement model. Additionally, the AVE value of 0.696 indicates convergent validity. The four valid measurement items demonstrate that customer loyalty is evident,

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particularly as reflected by Y3 (LF = 0.866), which indicates a tendency to recommend products and services to others. This finding aligns with the theory proposed by Singh (Rusdarti, 2004), which identifies recommending to others as an indicator of consumer loyalty.

Customer satisfaction is measured through four validated indicators, each exhibiting outer loading values ranging from 0.822 to 0.923. These high loading values indicate a robust correlation among the items, affirming their effectiveness in capturing the underlying construct of customer satisfaction. The reliability of the customer satisfaction construct is confirmed to be within acceptable limits, with Cronbach's Alpha at 0.876, composite reliability at 0.915, and an average variance extracted (AVE) of 0.729. These values, all exceeding the recommended thresholds, collectively demonstrate strong internal consistency, composite reliability, and convergent validity of the measurement model. Among the four validated measurement items, customer satisfaction is most prominently represented by indicator Z3, which exhibits the highest factor loading (LF = 0.923), indicating its strong contribution to the overall construct, which indicates satisfaction with the effectiveness of m-banking. This finding aligns with the theory proposed by Kotler and Kevin (2018), which asserts that customer satisfaction occurs when a customer's perception of product performance aligns with their expectations.

Reliability Test

Discriminant Validity: Fornell-Larcker Criterion

The assessment of discriminant validity involves the application of the Fornell and Larcker criterion. This form of evaluation verifies both the theoretical distinctiveness and empirical uniqueness of latent constructs, supported by statistical evidence. According to Fornell and Larcker (1981, as cited in Wong, 2013), discriminant validity is established when the square root of the Average Variance Extracted (AVE) for each construct exceeds its correlations with other constructs in the model. Satisfying this condition indicates that the constructs are sufficiently distinct, thereby affirming the discriminant validity of the measurement model. The service quality variable has an AVE root (0.821), which is greater in correlation than customer loyalty (0.752). The digital banking variable has a root AVE (0.925) which is greater in correlation than the variables of trust (0.587), customer satisfaction (0.664), service quality (0.790), and customer loyalty (0.668).

The discriminant validity of the constructs was confirmed using the Fornell-Larcker criterion. The square root of the Average Variance Extracted (AVE) for each construct exceeded its correlations with other constructs, thereby fulfilling the criterion for discriminant validity. Specifically, the trust construct demonstrated an AVE square root of 0.834, which is greater than its correlations with customer satisfaction (0.744), service quality (0.774), and customer loyalty (0.701). Similarly, customer satisfaction had an AVE square root of 0.854, exceeding its correlations with service quality (0.745) and customer loyalty (0.615). Additionally, customer loyalty reported an AVE square root of 0.779, which also surpasses its correlations with other constructs. These findings collectively confirm that all constructs exhibit satisfactory discriminant validity, indicating that each construct is empirically distinct from the others in the model.

Discriminant Validity - HTMT

Hair et al. (2019) advocate the use of the Heterotrait-Monotrait Ratio of Correlations (HTMT) as a more precise and reliable approach for assessing discriminant validity, due to its enhanced sensitivity in detecting a lack of discriminant validity. According to their recommendation, HTMT values should remain below the threshold of 0.90 to confirm acceptable discriminant validity. In this study, the HTMT values for all constructs were found to be below 0.90, thereby supporting the conclusion that discriminant validity has been adequately established across all variables.

Discriminant Validity- Cross Loadings

To make sure that the construct's correlation with the measurement items is higher than that of the other constructs, the cross loading value of each construct is assessed. Service quality

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variables X1.1, X1.2, X1.3, X1.5, X1.10, X1.11, X1.15, and X1.17 show lower connections with digital banking, trust, customer satisfaction, and customer loyalty variables and stronger correlations with the service quality variable, as seen in the above table. Service quality factors had a stronger correlation coefficient (0.763) than digital banking variables (0.549), trust (0.565), customer satisfaction (0.617), and customer loyalty (0.507). Therefore, it can be concluded that variable X1.1 is a reliable measure of service quality variables and a low measure of digital banking, trust, customer loyalty and customer satisfaction variables. This also happens to other variables. Consequently, discriminant validity with cross loading is fulfilled on an aggregate basis.

CONCLUSIONS, PROPOSALS, RECOMMENDATIONS

This study results in the validity value of all questions used in the questionnaire producing validity values in the loading factor parameter in accordance with the criteria above 0.70. With AVE parameters (convergent validity) in accordance with the criteria above 0.50 and with discriminant parameters (Fornell-Larcker, HTMT, and cross-loading) showing in accordance with the criteria below 0.90. The reliability value in all metrics, including composite reliability and Cronbach's alpha, thus likewise demonstrates compliance with the criterion above 0.70. Thus, this study proves that the questionnaire used to measure the level of customer loyalty at Bank Jatim Sub-Branch Karangjati Ngawi is valid and reliable

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