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The Effect of Service Quality and Digitalization of Betang Mobile Banking on Customer Loyalty Through Customer Satisfaction at PT. Bank Kalteng Sub-Branch of Bahaur

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Service Quality; Banking Digitalization; Customer Loyalty; Mobile Banking; Betang Mobile

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Abstract

This study aimed to examine the effect of service quality on customer loyalty and the moderating role of banking digitalization through the Betang Mobile application at PT Bank Kalteng, Bahaur Sub-Branch. The study was motivated by increasing competition in the banking industry during the digital era and inconsistent findings from previous research regarding the relationship between service quality and customer loyalty. An explanatory quantitative research design was employed. The study involved 96 customers, with the sample size determined using the Lemeshow formula and participants selected through purposive sampling. Data were collected using questionnaires and analyzed through partial least squares structural equation modeling (PLS-SEM) using SmartPLS version 4.1.1. The results indicated that service quality had a positive and statistically significant effect on customer loyalty ($\beta = 0.328$; $t = 4.439$; $p < 0.001$). Furthermore, banking digitalization positively and significantly moderated the relationship between service quality and customer loyalty (interaction coefficient $\beta = 0.098$; $t = 2.193$; $p = 0.028$), indicating that digitalization strengthened this relationship. The structural model explained 63.8% of the variance in customer loyalty ($R^2 = 0.638$). Reliability emerged as the strongest indicator of service quality, while repeat usage was the most prominent indicator of customer loyalty. These findings suggest that reliable banking services, supported by digital service innovations, can contribute to stronger customer loyalty and encourage continued use of banking services. Therefore, PT Bank Kalteng should prioritize improvements in service reliability while continuously enhancing the functionality, accessibility, and user experience of the Betang Mobile application to strengthen and sustain customer loyalty.

INTRODUCTION

The contemporary banking landscape is characterized by intensifying competition, rapid technological advancements, and increasing customer expectations regarding service delivery (Kasturi, 2023; Omarini, 2022). In the digital economy, financial institutions can no longer rely exclusively on conventional branch-based services. Instead, banks must develop seamless, responsive, and technology-driven service systems capable of meeting evolving customer needs. Digital transformation in the retail banking sector has emerged as an important strategy for enhancing customer satisfaction, strengthening brand trust, and maintaining long-term customer loyalty. Modern banking customers increasingly prefer

financial institutions that offer convenient, secure, and accessible services, including the ability to conduct transactions at any time and from any location.

National demographic data further illustrate this transition toward digital services. According to the Indonesian Internet Service Providers Association (*Asosiasi Penyelenggara Jasa Internet Indonesia* [APJII], 2024), Indonesia's internet penetration rate reached 79.5%, representing approximately 221 million internet users. Similarly, reports published by We Are Social and Meltwater (2025) indicated that Indonesia had approximately 212 million internet users, accounting for 74.6% of the population, with an annual growth rate of 8.7%. The reports also indicated that 98.7% of internet users accessed online services through mobile devices, with average daily internet usage exceeding seven hours. In the financial sector, Bank Indonesia reported substantial growth in digital banking transactions, with transaction values exceeding IDR 15,881.53 trillion, representing a year-over-year increase of 16.15%. These developments highlight the growing importance of digital banking services in supporting financial accessibility, transaction efficiency, and customer convenience (Bogers et al., 2022; Ulrich-Diener et al., 2025).

In response to this nationwide digital transformation, PT Bank Pembangunan Daerah Kalimantan Tengah (Bank Kalteng) introduced the Betang Mobile banking application. As a regional development bank, Bank Kalteng developed this digital platform to facilitate real-time banking transactions, including interbank transfers, bill payments, merchant payments, and account balance inquiries, without requiring customers to visit physical branches. For Bank Kalteng's Bahaur Sub-Branch, which serves a predominantly semi-rural and coastal area, Betang Mobile represents a strategic initiative to improve banking accessibility, enhance operational efficiency, and strengthen the bank's competitiveness against larger national commercial banks.

Nevertheless, operational challenges at the Bahaur Sub-Branch have affected the adoption and continued use of Betang Mobile. These challenges include inconsistent telecommunications connectivity, limited digital literacy among older customers and rural communities, preferences for cash-based transactions, and concerns regarding the security and reliability of digital banking services. Consequently, the bank faces the challenge of maintaining high-quality interpersonal services at its physical branch while simultaneously improving the accessibility, reliability, and functionality of its digital banking platform.

From a theoretical perspective, service quality is an important determinant of customer retention and loyalty. The SERVQUAL model developed by Parasuraman, Zeithaml, and Berry (1985) identifies five fundamental dimensions of service quality: tangibles, reliability, responsiveness, assurance, and empathy. Meanwhile, banking digitalization involves the transformation of conventional banking processes through digital technologies, innovative financial products, and technology-enabled service delivery (Kolapo et al., 2021; Pousttchi & Dehnert, 2018). Previous studies have demonstrated that higher service quality contributes positively to customer loyalty (Abror et al., 2020; Naini et al., 2022; Özkan et al., 2020; Rasool et al., 2021; Saputra et al., 2022; Seridaran & Mohd Noor, 2021). However, empirical findings remain inconsistent, as several studies have reported that conventional service quality has an insignificant or indirect effect on customer loyalty in contemporary multichannel banking environments (Akmal et al., 2022; Alzaydi, 2024; Gonu et al., 2023).

These inconsistencies highlight a research gap concerning the conditions under which service quality contributes to customer loyalty. Specifically, further investigation is needed to determine whether banking digitalization strengthens the relationship between service quality and customer loyalty, particularly within regional banking institutions operating in areas with varying levels of digital infrastructure and technological literacy.

Based on this background, the first research question was formulated as follows: Does service quality have a positive and statistically significant effect on customer loyalty at Bank Kalteng's Bahaur Sub-Branch?

The second research question was formulated as follows: Does banking digitalization positively moderate the relationship between service quality and customer loyalty at Bank Kalteng's Bahaur Sub-Branch?

Accordingly, this study aimed to empirically examine the direct effect of service quality on customer loyalty and investigate the moderating role of banking digitalization through the Betang Mobile application. Two hypotheses were proposed: H1, service quality has a positive and statistically significant effect on customer loyalty; and H2, banking digitalization positively moderates the relationship between service quality and customer loyalty, such that the relationship becomes stronger at higher levels of banking digitalization. Theoretically, this study contributes to the literature on service marketing, customer relationship management, and digital banking by examining the moderating role of mobile banking digitalization in the relationship between service quality and customer loyalty within a regional banking context. Practically, the findings provide insights for Bank Kalteng's management to improve service reliability, enhance the stability and functionality of the Betang Mobile application, optimize resource allocation, and develop customer retention strategies tailored to the characteristics and needs of regional banking customers.

METHOD

Research Design, Population, and Sampling

This study employed an explanatory quantitative research design to examine the hypothesized relationships among the latent constructs. The target population consisted of active retail customers of PT Bank Kalteng, Bahaur Sub-Branch. Because the exact population size was unknown, the minimum sample size was estimated using the Lemeshow formula, assuming a 95% confidence level, a population proportion of 0.50, and a 10% margin of error. The calculation yielded a minimum sample size of approximately 96 respondents. Participants were selected using purposive sampling based on three inclusion criteria: (1) active retail account holders at PT Bank Kalteng, Bahaur Sub-Branch; (2) individuals aged 17 years or older; and (3) customers with prior transaction experience using both branch counter services and the Betang Mobile banking application. A total of 100 structured questionnaires were distributed and returned, of which 96 were complete and suitable for statistical analysis, yielding a usable response rate of 96.0%.

Variable Operationalization and Measurement

All latent variables were operationalized through reflective indicators adapted from validated scholarly literature. Each measurement item was scored using a five-point Likert scale ranging from 1 ('Strongly Disagree') to 5 ('Strongly Agree').

Table 1. Operational Definitions, Measurement Indicators, and Theoretical Sources

Variable	Operational Definition	Measurement Indicators	Theoretical Source
Service Quality (X1)	The degree of overall excellence and consistency delivered by the bank across physical, procedural, and relational touchpoints.	1. Tangibility (X1.1) 2. Reliability (X1.2) 3. Responsiveness (X1.3) 4. Assurance (X1.4) 5. Empathy (X1.5)	Parasuraman et al. (1985); Zeithaml et al. (2002)
Banking Digitalization (Z)	The strategic deployment of mobile application technology (Betang Mobile) to provide agile, secure, and boundaryless financial services.	1. Innovative service provision (Z1.1) 2. Generation of new products (Z1.2) 3. Entrance into new markets (Z1.3) 4. Adoption of technological tools (Z1.4)	Kolapo et al. (2021); Kotler et al. (2016)
Customer Loyalty (Y)	A deeply held consumer commitment to continuously patronize, reuse, and advocate the bank's services despite competitive alternatives.	1. Repeat purchases/service reuse (Y1.1) 2. Willingness to recommend to others (Y1.2) 3. Spreading positive word-of-mouth (Y1.3)	Kotler et al. (2016)

Data Analysis Technique

Data analysis was conducted using variance-based Structural Equation Modeling–Partial Least Squares (SEM-PLS) executed via SmartPLS 4.1.1 software. SEM-PLS was selected due to its predictive orientation, robustness against non-normal empirical distributions, and suitability for complex moderation models without sacrificing statistical power. The analytical framework comprised two sequential phases:

1) **Measurement Model Assessment (Outer Model)**

Evaluated reflective constructs for indicator reliability (outer loadings >= 0.708), convergent validity (Average Variance Extracted / AVE >= 0.50), construct reliability (Cronbach's alpha >= 0.70 and Composite Reliability / rho_c >= 0.70), and discriminant validity assessed through the Fornell-Larcker criterion, Heterotrait-Monotrait ratio of correlations (HTMT < 0.90), and cross-loading matrices.

2) **Structural Model Assessment (Inner Model)**

Evaluated model fit and hypothesized pathways using the coefficient of determination (R^2), predictive relevance via Stone-Geisser's blindfolding procedure (Q^2 > 0), variance inflation factors for collinearity assessment (inner VIF < 5.0), and non-parametric bootstrapping with 5,000 resamples to determine path coefficients, t-statistics, and two-tailed p-values (alpha = 0.05).

RESULTS AND DISCUSSION

Demographic Profile of Respondents

The demographic composition of the 96 participating respondents provides critical socio-economic context for interpreting banking behavior at PT. Bank Kalteng Bahaur Sub-Branch, as detailed in Table 2.

Table 2. Demographic Profile of Survey Respondents (N = 96)

Demographic Profile	Classification Category	Frequency (n)	Percentage (%)
Gender	Male	59	61.5%
	Female	37	38.5%
Age Distribution	21 – 30 years old	12	12.5%
	31 – 40 years old	35	36.5%
	41 – 50 years old	33	34.4%
	51 – 60 years old	16	16.7%
Educational Background	Senior High / Vocational School	33	34.4%
	Diploma (D3)	9	9.4%
	Bachelor's Degree (S1)	47	49.0%
	Master's Degree (S2)	7	7.3%
Occupational Status	Civil Servants / ASN	40	41.7%
	Entrepreneurs / MSMEs	40	41.7%
	State / Regional SOE Employees	16	16.7%

The demographic profile demonstrates that the sample is predominantly male (61.5%) and heavily concentrated in economically mature and productive age brackets, with 70.9% aged between 31 and 50 years. Furthermore, 56.3% of respondents hold higher education degrees (Bachelor's and Master's), and 83.4% are either civil servants (ASN, 41.7%) or local business entrepreneurs (41.7%). These customer segments maintain frequent and routine financial transaction requirements (e.g., payroll processing, commercial supplier settlements, and fund transfers), making them highly sensitive to both branch operational reliability and mobile banking convenience.

Descriptive Analysis of Variables

The descriptive statistical distribution across the research variables is classified based on mean score thresholds: Low (1.00–2.33), Moderate (2.34–3.66), and High/Good (3.67–5.00).

Table 3. Descriptive Statistics of Research Variables and Indicators

Construct / Indicator Code	Measurement Indicator	Min	Max	Mean	Categorical Level
X1.1	Tangibility	2.00	5.00	3.95	High / Good
X1.2	Reliability	2.00	5.00	3.75	High / Good
X1.3	Responsiveness	2.00	5.00	3.98	High / Good
X1.4	Assurance	2.00	5.00	3.78	High / Good
X1.5	Empathy	1.00	5.00	3.94	High / Good
Service Quality (X1)	Overall Construct Mean	1.00	5.00	3.88	High / Good
Z1.1	Innovative service provision	1.00	5.00	3.86	High / Good
Z1.2	Generation of new products	2.00	5.00	4.06	High / Good
Z1.3	Entrance into new markets	1.00	5.00	4.01	High / Good
Z1.4	Adoption of technological tools	1.00	5.00	3.85	High / Good
Banking Digitalization (Z)	Overall Construct Mean	1.00	5.00	3.95	High / Good
Y1.1	Repeat purchases / service reuse	2.00	5.00	3.95	High / Good

Y1.2	Willingness to recommend to others	2.00	5.00	4.11	High / Good
Y1.3	Conveying positive word-of-mouth	2.00	5.00	3.90	High / Good
Customer Loyalty (Y)	Overall Construct Mean	2.00	5.00	3.99	High / Good

All three latent constructs recorded overall mean evaluations located solidly in the 'High/Good' category: Service Quality (3.88), Banking Digitalization (3.95), and Customer Loyalty (3.99). In service quality, responsiveness attained the highest individual score (3.98), whereas reliability registered the lowest (3.75), indicating an area requiring continuous managerial oversight. Within banking digitalization, new product generation was rated highest (4.06), while technology adoption scored 3.85. For customer loyalty, willingness to recommend stood out as the strongest dimension (4.1).

Measurement Model Assessment (Outer Model)

The measurement model was subjected to rigorous psychometric evaluation covering convergent validity, internal consistency reliability, and discriminant validity.

Table 4. Measurement Model Quality: Factor Loadings, Reliability, and Convergent Validity

Construct	Indicator	Outer Loading	Cronbach's Alpha	Composite Reliability (rho_c)	AVE
Service Quality (X1)	X1.1 (Tangibility)	0.728	0.862	0.898	0.640
	X1.2 (Reliability)	0.881			
	X1.3 (Responsiveness)	0.751			
	X1.4 (Assurance)	0.879			
	X1.5 (Empathy)	0.748			
Banking Digitalization (Z)	Z1.1 (Innovative Service)	0.911	0.885	0.921	0.746
	Z1.2 (New Products)	0.766			
	Z1.3 (Market Entrance)	0.864			
	Z1.4 (Tech Tools Adoption)	0.906			
Customer Loyalty (Y)	Y1.1 (Repeat Purchases)	0.861	0.758	0.861	0.674
	Y1.2 (Recommendation)	0.835			
	Y1.3 (Positive Info Sharing)	0.763			

As documented in Table 5, all individual outer loadings exceed the recommended threshold of 0.708 (ranging between 0.728 and 0.911) with statistically significant p-values ($p = 0.000$). The Average Variance Extracted (AVE) values for Service Quality (0.640), Banking Digitalization (0.746), and Customer Loyalty (0.674) substantially surpass the 0.50 benchmark, demonstrating robust convergent validity. Construct reliability is confirmed through Cronbach's alpha values (0.758 to 0.885) and Composite Reliability coefficients (0.861 to 0.921), all comfortably exceeding the established 0.70 criterion.

Discriminant validity was established via two complementary criteria: the Fornell-Larcker criterion and the Heterotrait-Monotrait (HTMT) ratio.

Table 5. Discriminant Validity Assessment: Fornell-Larcker Criterion and HTMT Matrix

Construct	Fornell-Larcker: Dig. Banking	Fornell-Larcker: Serv. Quality	Fornell-Larcker: Cust. Loyalty	HTMT Ratio
Banking Digitalization (Z)	0.864	-	-	-
Service Quality (X1)	0.037	0.800	-	HTMT (X1 <-> Z) = 0.125
Customer Loyalty (Y)	0.729	0.279	0.821	HTMT (Y <-> Z) = 0.877; HTMT (Y <-> X1) = 0.333

Under the Fornell-Larcker criterion (Table 6), the square root of the AVE for each construct (bolded diagonal elements: 0.864, 0.800, and 0.821) strictly exceeds its highest bivariate correlation with any other latent construct. Furthermore, all HTMT values (0.125, 0.333, and 0.877) satisfy the conservative threshold of HTMT < 0.90, confirming that each construct captures distinct empirical phenomena.

Structural Model Assessment (Inner Model) and Hypothesis Testing

Prior to hypothesis testing, collinearity was examined through Variance Inflation Factors (VIF). The inner VIF values for Banking Digitalization -> Customer Loyalty (1.114), Interaction Term (Z * X1) -> Customer Loyalty (1.144), and Service Quality -> Customer Loyalty (1.037) are well below the conservative ceiling of 3.0, proving the complete absence of multicollinearity.

The coefficient of determination (R^2) for Customer Loyalty is 0.638, signifying that 63.8% of the variance in customer loyalty at PT. Bank Kalteng Bahaur Sub-Branch is explained by service quality and the moderating role of banking digitalization, with the remaining 36.2% attributable to extraneous factors. The Stone-Geisser Q^2 values for the loyalty indicators range between 0.291 and 0.472, firmly exceeding zero and indicating substantial out-of-sample predictive relevance.

Table 6. Structural Model Path Coefficients and Hypothesis Testing Results

Structural Path	Original Sample (Beta)	Sample Mean (M)	Std. Deviation	T-Statistics	P-Value	Empirical Decision
Service Quality -> Customer Loyalty	0.328	0.331	0.074	4.439	0.000	H1 Supported (Sig.)
Banking Digitalization x Service Quality -> Customer Loyalty	0.098	0.102	0.045	2.193	0.028	H2 Supported (Sig.)
Banking Digitalization -> Customer Loyalty (Direct Control)	0.778	0.778	0.048	16.190	0.000	Significant Direct Effect

The bootstrapping results summarized in Table 7 support both research hypotheses:

Hypothesis 1

Service Quality demonstrates a positive, direct, and statistically significant effect on Customer Loyalty (Beta = 0.328, t = 4.439, p = 0.000 < 0.05). Thus, H1 is empirically supported.

Hypothesis 2

The interaction construct (Banking Digitalization * Service Quality) exhibits a positive and statistically significant moderating effect on Customer Loyalty (Beta = 0.098, t = 2.193, p = 0.028 < 0.05). Thus, H2 is empirically supported, demonstrating that banking digitalization acts as a quasi-moderator that magnifies the positive impact of service quality on customer loyalty.

Discussion of Empirical Findings

1) The Direct Impact of Service Quality on Customer Loyalty

The empirical confirmation of H1 (Beta = 0.328, p = 0.000) aligns with established relationship marketing theories and corroborates previous studies (Abror et al., 2020; Dhasan & Aryupong, 2019; Özkan et al., 2020; Syahril et al., 2022). Within the service quality construct, reliability emerged with the highest outer loading (0.881), while repeat purchase/reuse constituted the strongest reflection of customer loyalty (0.861). This finding indicates that customer retention in regional banking is fundamentally anchored in operational reliability namely, the bank's ability to execute financial transactions accurately, consistently, and without administrative errors. In rural operating environments like Bahaur, where branch alternatives are limited, customers prize dependability above superficial amenities.

Conversely, tangibility recorded the lowest outer loading (0.728), and conveying positive information scored lowest among loyalty dimensions (0.763). This demonstrates that while physical branch aesthetics and modern office facilities establish a professional baseline, they do not serve as decisive loyalty drivers compared to dependable service execution and empathetic staff problem-solving.

2) The Moderating Role of Banking Digitalization

The empirical validation of H2 (Beta = 0.098, p = 0.028) provides compelling evidence that banking digitalization via Betang Mobile reinforces and amplifies the positive effect of service quality on customer loyalty. This finding aligns with Kriebel and Debener (2020) and Pousttchi and Dehnert (2018), who emphasize that digital channel integration acts as a capability multiplier for retail financial institutions. Within the digitalization construct, innovative service provision recorded the highest outer loading (0.911), confirming that customers highly value practical, responsive, and adaptive mobile banking features.

When Bank Kalteng Bahaur combines reliable counter services with an accessible, stable Betang Mobile platform, customers experience frictionless multi-channel convenience. Digitalization eliminates geographical barriers and branch queuing times, enabling customers to conduct routine transactions remotely while relying on local branch personnel for complex advisory needs. This synergistic integration fosters deeper customer trust, curbs churn propensity, and transforms transactional satisfaction into enduring brand loyalty.

CONCLUSION

Based on the hypothesis testing results, service quality had a positive and statistically significant effect on customer loyalty. This finding indicated that improvements in service quality, encompassing tangibles, reliability, responsiveness, assurance, and empathy, contributed to stronger customer loyalty. High-quality banking services encouraged customers to continue using the bank's products and services, recommend them to others, and engage in positive word-of-mouth communication. Furthermore, consistent service quality could enhance customer satisfaction, strengthen trust, and foster emotional attachment to the bank, thereby supporting long-term customer loyalty.

Furthermore, banking digitalization positively and significantly moderated the relationship between service quality and customer loyalty, indicating that higher levels of digitalization strengthened the positive effect of service quality on customer loyalty. Digital service innovation, the development of new banking products, expansion into new markets, and adoption of advanced technological tools enhanced the accessibility, efficiency, and convenience of banking services. The effective integration of digital technologies, particularly through the Betang Mobile application, complemented conventional banking services and contributed to a more positive customer experience. Consequently, customers were more likely to continue using the bank's services, recommend them to others, and promote a favorable institutional image through positive word-of-mouth communication.

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CONFLICT OF INTEREST

The author states that there are no conflicts of interest, whether personal, commercial, or financial, that can affect the implementation and results of this study.

AUTHOR CONTRIBUTION

Author 1 contributes to research design, data collection and processing, system development, result analysis, and article manuscript preparation.

GENERATIVE ARTIFICIAL INTELLIGENCE USAGE STATEMENT

In the process of compiling this article, the author uses generative artificial intelligence (AI) as a tool in language refinement, writing structure, and grammar improvement. The use of AI is carried out on a limited basis and remains under the supervision of the author. All data, analysis, interpretation, and scientific substance in this article have been checked and verified by the author. The author is solely responsible for the accuracy, authenticity, and final content of the manuscript.

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