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Digital Banking Service Quality and Customer Satisfaction: The Moderating Role of Digital Literacy in Bangladesh

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Abstract
This study examines the role of reliability and responsiveness to customer satisfaction and tests the influence of digital literacy in digital banking. Service quality has been closely related to customer satisfaction, but it is unknown how customers' digital ability moderates this link in particular Bangladesh. A quantitative study was conducted using a structured questionnaire to gather information from 255 commercial bank customers in different areas in Bangladesh. The conceptual model was estimated using a partial least squares structural equation modeling approach. The measurement model was evaluated in terms of reliability and validity, and bootstrap procedures were carried out to assess direct and moderating mechanisms. Reliability has a positive and significant impact on customer satisfaction ($\beta = 0.587$, $p < 0.001$), while responsiveness has a positive effect as well ($\beta = 0.123$, $p = 0.006$). Digital literacy has a positive direct effect on customer satisfaction ($\beta = 0.118$, $p = 0.005$), and it significantly enhances the effects of reliability ($\beta = 0.263$, $p < 0.001$) and responsiveness ($\beta = 0.129$, $p = 0.030$). The model explains 61.6% of the variance in customer satisfaction. The results indicate that digital banking service quality and customer capability should be considered together to enhance digital banking experiences. The study contributes by highlighting digital literacy as a boundary condition of service quality effects and provides implications in terms of customer-centric digital banking in Bangladesh.

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***Keywords**: Digital banking, Reliability, Responsiveness, Customer satisfaction, Digital literacy.*

1. Introduction

Digital banking has revolutionized the way customers interact with commercial banks in Bangladesh. Recent Bangladeshi evidence confirms this shift (Monir et al., 2025). Internet banking, mobile banking, ATMs and other digital channels have reduced the need to visit physical branches and made everyday banking services more accessible. However, wider accessibility does not necessarily ensure an enhanced customer experience as customers evaluate the digital banking service against the accuracy of transaction processing, dependability of services and availability of help in case of any problem. Digital service features drive satisfaction (Chu & Zhan, 2024). Thus, service quality remains an important contributor to customer satisfaction in digital

banking despite banking being increasingly technology-intensive. Expectations and perceived risk shape satisfaction too (Barjaktarovic Rakocevic et al., 2025). Two key service quality dimensions are reliability and responsiveness. SERVQUAL still explains banking satisfaction (Aladwani, 2024). Reliability refers to the degree to which service processes deliver promised services accurately, consistently and dependably, whereas responsiveness reflects the willingness of the bank to provide prompt assistance and resolve customer problems (Parasuraman et al., 1988; Rahaman et al., 2020; Bashir et al., 2023). Previous studies have largely identified the relevance of these two service quality aspects, although their impact varies for different banking contexts. Findings have indicated mixed effects of the service quality dimensions on customer satisfaction across different contexts (Khan et al., 2021; Islam et al., 2023). Responsiveness did not predict satisfaction in one chatbot study (Alshibly et al., 2024). The variation suggests that service quality's influence might be shaped not only by the offerings from the banks but also by the customers' ability to engage and evaluate various digital services. Part of this variation may reflect customer capability, not just bank quality. Reliability is especially critical for digital banking as customers expect the transactions, balances and services to be processed accurately every time. Responsiveness in turn is important as customers have to deal with failed transactions, technical problems and service requests. Previous studies have shown that both aspects can impact customer satisfaction and adoption (Rahaman et al., 2020; Bashir et al., 2023; Ayinaddis et al., 2023; Gautam & Sah, 2023). However, the view of service quality as a universal moderating force overlooks another crucial customer-level characteristic: digital literacy. Digital literacy refers to customers' ability to access, understand, evaluate and use digital technologies. In context of banking, it involves customers' capability to navigate through applications, make sense of information, perform transactions and address technological problems (Van Laar et al., 2017; Husne Jahan et al., 2024). Customers with digital literacy may be able to benefit from reliable services as they can access dependable services in a timely manner and receive prompt help to address service failures. Suparno et al. (2023) found no direct effect on bank interest. Despite this rationale, the role of digital literacy has mainly been viewed as a direct determinant of technology usage or satisfaction, its moderating role on the service quality-satisfaction relation remains under-investigated. Wagdi et al. (2026) show its moderating role in Egypt. That study used a single service-quality score. It did not separate reliability from responsiveness. It therefore cannot say which dimension depends more on user skill. It also tested Egypt, not Bangladesh. These two limits shape the present study. We test the two dimensions apart, in one local sample, and compare the two interaction effects directly. The question of interest, then, is not about the overall reliability and responsiveness effect on satisfaction that has largely been established across the previous literature. More relevant is the question of whether the effect varies with customers' digital capability. This study addresses three major gaps in the literature. Recent reviews still report this moderation gap (Wagdi et al., 2026). One, reliability and responsiveness have been considered as key predictors of service quality whereas little attention has been given to their differential impact on satisfaction at various levels of digital capability. Two, digital literacy has been identified as a critical determinant of service adoption and satisfaction; however, the variation in its impact on satisfaction is poorly understood in context of digital banking. Three, the moderation mechanism has not yet been sufficiently investigated at the national level in Bangladesh for commercial bank customers. Addressing these gaps is critical as the changes of digital banking infrastructure may not necessarily yield similar satisfaction outcomes for different levels of digital capability. Given the above rationale, this study investigates the effect of reliability and responsiveness on customer satisfaction and the moderation role played by digital literacy in the context of Bangladesh. Its contribution comprises three aspects. First, it provides a wider perspective on the role of service quality as an important criterion in service provision by considering digital literacy as a boundary condition rather than as a direct customer characteristic. This boundary-condition framing is the study's main analytical contribution. Second, it assesses the predictive power of reliability and responsiveness by investigating both together within a single model based on commercial bank customers across Bangladesh. The sample covers customers from several regions, not one city. Third, it highlights the role for banks to consider platform quality alongside

customer capability in digital service provision with the main argument being that enhanced service quality does matter but its value for customers depends on their digital capability. Wagdi et al. (2026) call this a dual strategy.

2. Literature review

2.1 Theoretical Framework

2.1.1 SERVQUAL theory

SERVQUAL, introduced by Parasuraman, Zeithaml, and Berry (1988), provides the main service-quality foundation for this study. Its dimensions still hold in e-banking (Paltayian et al., 2026). The framework identifies reliability and responsiveness among the core dimensions through which customers evaluate service performance. In the case of digital banking, reliability captures whether services are delivered accurately and consistently, while responsiveness captures how promptly the bank supports customers and addresses service problems. These dimensions are therefore directly relevant to customers' evaluations of digital banking quality (Rahaman et al., 2020; Dam & Dam, 2021). Hamzah et al. (2017) linked SERVQUAL to trust and reputation. That work measured outcomes, not conditions. Later validation studies follow the same pattern. SERVQUAL is confirmed as a measurement tool, but its conditional behaviour is rarely tested. Recent e-banking work still supports its dimensions (Paltayian et al., 2026). What remains open is how much each dimension contributes under different user conditions. This study treats that question as testable rather than settled. SERVQUAL supports the proposed direct relationships between reliability and responsiveness and customer satisfaction. The relevance of SERVQUAL is strengthened by the digital setting, where customers evaluate service performance through technology rather than only through face-to-face interactions. A technically available platform is valuable only when it performs reliably and responds effectively when customers need assistance. Thus, SERVQUAL provides the basis for explaining why reliability and responsiveness should influence satisfaction.

2.1.2 Expectation Confirmation Theory (ECT)

Expectation Confirmation Theory (ECT), proposed by Oliver (1980), explains satisfaction as an evaluation formed by comparing expectations with experienced performance. ECT has since been extended into banking settings (Ismail, 2023). The theory has also been applied to information systems and technology-enabled services to explain post-adoption satisfaction (Bhattacherjee, 2001). In the case of digital banking, customers continuously judge whether transactions, access, convenience, and support perform as expected. Reliable service and timely assistance can therefore increase the likelihood that expectations are confirmed, leading to greater satisfaction. Rahi and Abd. Ghani (2019) integrated ECT with SDT in banking. Together, SERVQUAL and ECT provide a coherent explanation for the proposed model. SERVQUAL identifies the service attributes that customers evaluate, while ECT explains how the resulting experience translates into satisfaction. SERVQUAL supplies the attributes; ECT supplies the mechanism. Digital literacy adds a customer-capability perspective: customers with different levels of digital ability may not derive the same value from the same service environment. Capability decides how much performance becomes confirmed expectation. The combined framework therefore supports testing digital literacy as a moderator of the reliability-satisfaction and responsiveness-satisfaction relationships.

2.2 Digital banking service quality

Digital banking service quality captures customers' general perception of services rendered through digital channels, including internet banking, mobile banking, and other related services. It reflects customers' evaluation of accuracy, effectiveness, security, convenience, and responsiveness of the service provided. Prior studies suggest that improved digital service quality positively influences customer satisfaction, continuing use, and relationships (Rahaman et al., 2020; Khan et al., 2021; Bashir et al., 2023). Chu and Zhan (2024) report convenience and security effects. Similarly, evidence from developing economies further supports the importance of service quality in the digital banking context (Ayinaddis et al., 2023; Gautam & Sah, 2023; Kashif,

Babar & Khan, 2026). Barjaktarovic Rakocevic et al. (2025) add perceived risk and expectations. In this study, reliability and responsiveness are considered as two service-quality dimensions directly related to the customer experience of digital service delivery.

2.3 Customer satisfaction

Customer satisfaction reflects customers' overall evaluation of a service following a comparison of what they expected against what they experienced. In the case of digital banking, it is shaped by how the services rendered are convenient, dependable, efficient, and able to meet customers' needs. Satisfied customers are more likely to remain with their banks and continue using digital services (Dam & Dam, 2021; Shariff et al. 2024). Supriyanto et al. (2021) found satisfaction mediates loyalty. Empirical studies further show that improved digital service quality can increase customer satisfaction through enhanced service experiences and perceived value (Bashir et al., 2023; Gazi et al., 2024). Aladwani (2024) reports similar satisfaction patterns. Thus, customer satisfaction is an appropriate outcome for examining whether reliability and responsiveness translate into an improved digital banking experience. Three things are clear from this review. First, service quality is consistently linked to satisfaction in banking, and reliability and responsiveness remain the two dimensions most often examined (Rahaman et al., 2020; Aladwani, 2024). Second, digital service features such as convenience and security add to satisfaction but do not replace the core dimensions (Chu & Zhan, 2024). Third, customer capability has entered the discussion only recently, and mostly as a direct predictor rather than as a condition (Wagdi et al., 2026). What is not yet clear is whether the two core dimensions respond equally to customer capability. The hypotheses below address that question directly.

2.4 Hypotheses development

2.4.1 Reliability and customer satisfaction

Reliability refers to a bank's ability to provide digital services accurately and consistently with minimal operational failure. For customers, it takes the form of accurate transactions, stable systems, and dependable service performance. Evidence from Bangladesh suggests that reliable banking services contribute to higher customer satisfaction (Rahaman et al., 2020), while other developing-economic evidence further links dependable online services to confidence and continued use (Gautam & Sah, 2023; Ifedi et al., 2024). Reliability and personalization predicted satisfaction (Alshibly et al., 2024). When customers cannot rely on a digital service to perform as promised, other service features are unlikely to fully compensate. Setiono and Hidayat (2022) found reliability most dominant. Therefore:

H1*: Reliability has a positive and significant effect on customer satisfaction.*

2.4.2 Responsiveness and customer satisfaction

Responsiveness is concerned with the speed and willingness with which a bank assists customers and resolves service problems. It becomes evident in digital banking as customers attempt transactions that fail, experience technical problems, or request assistance. Timely assistance can reduce uncertainty and improve the overall service experience. Yet its effect may be weaker in automated channels (Alshibly et al., 2024). Evidence from banking research indicates that responsive service delivery contributes to customer satisfaction (Gautam & Sah, 2023; Ifedi et al., 2024), with Bangladesh-based evidence also supporting the importance of effective support in online banking (Islam et al., 2023). Fida et al. (2020) found responsiveness significant in Oman. Therefore:

H2*: Responsiveness has a positive and significant effect on customer satisfaction.*

2.4.3 Moderating role of digital literacy

Digital literacy is the capability to access, understand, and use digital technologies effectively. In the case of digital banking, it influences how confidently customers navigate applications, interpret digital information, and use available functions. It can therefore shape the quality of customers' interactions with technology, rather than being merely a background demographic characteristic (Van Laar et al., 2017; Jebarajakirthy & Shankar, 2021). Suparno et al. (2023) found

no direct effect on interest. Customers with stronger digital capability may be better able to understand service features, complete transactions, and manage routine digital problems, leading to more favourable service experiences. Wagdi et al. (2026) link it to satisfaction returns. The literature also suggests that digital capability can influence how customers respond to technology-based financial services. This makes digital literacy relevant to the present study not only as a direct influence on satisfaction, but also as a possible condition under which service quality produces stronger or weaker outcomes. The moderation perspective is particularly relevant where customers differ substantially in their ability to engage with digital banking.

Service quality may not affect all customers in exactly the same way. Customers with higher digital literacy are more likely to understand platform functions, use available features effectively, and respond to technology-related problems. As a result, they may be better able to recognize and benefit from reliable and responsive digital services (Jebarajakirthy & Shankar, 2021). Wagdi et al. (2026) found this in Egyptian banking. Digital literacy can therefore be viewed as a customer capability that changes the strength of the service quality-satisfaction relationship rather than simply adding another direct predictor. Their model explained 57% of satisfaction variance (Wagdi et al., 2026). Existing research has given considerable attention to digital literacy as an independent factor, but relatively less attention has been given to its moderating role in digital banking service quality research, particularly in developing-country settings such as Bangladesh. The present study addresses this gap by testing whether digital literacy strengthens the effects of reliability and responsiveness on customer satisfaction. This approach moves the discussion from whether customers possess digital skills to how those skills change the value they obtain from service quality.

H3*: Digital literacy significantly moderates the relationship between reliability and customer satisfaction.*

H4: *Digital literacy significantly moderates the relationship between responsiveness and customer satisfaction.*

Overall, the literature supports a direct link between digital banking service quality and customer satisfaction, with reliability and responsiveness remaining important service dimensions. It also indicates that digital literacy shapes customers' ability to engage with digital services. The unresolved issue is whether digital literacy changes the strength of the service quality effects. The present study addresses that issue by testing two interaction effects among commercial bank customers in Bangladesh.

2.5 Conceptual framework

The conceptual framework combines SERVQUAL and ECT to explain customer satisfaction in digital banking. Reliability and responsiveness represent core dimensions of digital banking service quality, while customer satisfaction is the outcome. Digital literacy is positioned as a modulator because the value customers obtain from service quality may depend on their ability to use and interpret digital banking services effectively (Van Laar et al., 2017; Jebarajakirthy & Shankar, 2021). The framework tests boundary conditions, not just direct effects. The framework therefore tests both direct service-quality effects and whether digital literacy changes their strength. The logic of the framework follows from the two theories. SERVQUAL explains why reliability and responsiveness should matter at all. It treats them as attributes that customers use to judge service performance (Parasuraman et al., 1988). ECT explains why that judgement becomes satisfaction. It treats satisfaction as a comparison between expectation and experience (Oliver, 1980). Neither theory, on its own, says whether the translation from service quality to satisfaction is uniform across customers. That is the gap the framework addresses.

Digital literacy is placed as the moderator for three reasons. First, it is a customer-level capability, not a bank-level attribute. It therefore belongs on the customer side of the model, where it can interact with service quality rather than compete with it. Second, it directly shapes how customers use a digital platform. It affects whether they can complete transactions, read system

outputs, and solve routine problems without support (Van Laar et al., 2017). Third, it has already been shown to amplify the service quality–satisfaction link in a comparable setting. Wagdi et al. (2026) report this amplification in Egyptian banking. The framework extends that logic by treating the two service dimensions separately. The framework also responds to the conditional behaviour that SERVQUAL-based studies tend to leave open. SERVQUAL dimensions are usually tested as fixed drivers. The framework treats them as conditional drivers instead. Reliability and responsiveness remain the inputs. Customer satisfaction remains the output. Digital literacy sets how strongly each input travels to the output. This is why the model includes two interaction paths rather than one combined path. The resulting model is deliberately simple. It has four constructs, two direct paths, and two interaction paths. Simplicity matters here because the aim is comparison, not complexity. The two interaction paths make it possible to ask which service dimension is more dependent on customer capability. That comparison is the analytical core of the study. It also differs from moderation work that combined service quality into a single score, such as Wagdi et al. (2026). Figure 2.1 presents the framework. The arrows from reliability and responsiveness to customer satisfaction represent the direct effects tested in H1 and H2. The arrow from digital literacy to customer satisfaction represents its direct effect on the outcome. The two interaction paths represent H3 and H4, where digital literacy is expected to change the strength of the direct relationships. The framework does not propose mediation, and it does not include feedback loops. It is a boundary-condition model, and it is tested as such.

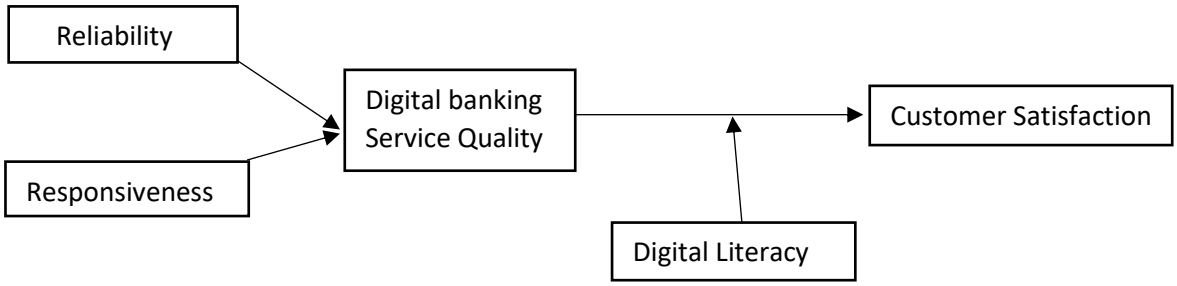


Figure 1: Proposed Conceptual Framework

Source: *Developed by the author based on Parasuraman et al. (1988), Oliver (1980), Bhattacherjee (2001), Van Laar et al. (2017), and Jebarajakirthy and Shankar (2021).*

3. Research Methodology

3.1 Research Design and Data Collection

A quantitative, explanatory and cross-sectional design was used. Primary data were collected from 255 commercial bank customers from different areas of Bangladesh using a structured questionnaire. Respondents came from several districts, not a single city. The respondents were using digital banking services and were screened. All respondents had used digital banking in the past six months. The design was chosen to match the research question. The question concerns how customers differ, not how banks differ, so the unit of analysis is the individual customer. A cross-sectional survey is appropriate for testing interaction effects at one point in time. The sample of 255 exceeds the minimum required for a PLS-SEM model with four constructs and two interaction terms (Hair et al., 2019). Respondents came from several districts rather than one city, which broadens coverage. The sample is not a probability sample of all Bangladeshi bank customers, and no national representation is claimed. What the design supports is a test of whether the two service-quality links behave differently under different levels of digital literacy. The participants were not forced to participate in the study and were informed that their responses would be used solely for academic research purposes.

3.2 Measurement of Variables

The measurement items (table 1) were adapted from extant scales to fit into the scope of the present study while retaining their meanings. All constructs were measured using a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

Table 1: Measurement of Variables

Construct	No. of Items	Measurement Source
Reliability	4	Hammoud et al. (2018); Bashir et al. (2023)
Responsiveness	4	Hammoud et al. (2018); Islam et al. (2023)
Digital Literacy	4	Van Laar et al. (2017); Husne Jahan et al. (2024)
Customer Satisfaction	4	Khan et al. (2021); Bashir et al. (2023)

Source: *Khan et al. (2021); Bashir et al. (2023)*

3.3 Data Analysis Tools and Technique

The data were analyzed using SmartPLS 4 software by applying the PLS-SEM technique. In this study, Cronbach's alpha, rho_A, Composite Reliability (CR), Average Variance Extracted (AVE), Fornell-Larcker criterion, HTMT and VIF were used to evaluate the measurement model. Moreover, the structural model was estimated using path coefficients, bootstrapping, p-values and R^2. To test the moderation role of digital literacy, a Product Indicator Approach was applied. To assess the model fit, SRMR and N FI were used (Hair et al., 2019).

4. Data Analysis and Results Discussion

4.1 Measurement Model Assessment

The measurement model was assessed using outer factor loadings, Cronbach's alpha, composite reliability (CR), and average variance retrieved. Table 2 reveals that all outer factor loadings exceeded 0.70, indicating satisfactory indicator reliability. Cronbach's alpha and CR scores surpassed 0.70, whereas all AVE values exceeded 0.50 (Hair et al., 2019). These findings validate the measurement model's internal consistency and convergent validity.

Table 2: Outer Factor Loadings, Composite Reliability, AVE and Cronbach's Alpha (a)

Construct	Outer Factor Loading	Average Variance Extracted (AVE)	Composite Reliability (CR)	Cronbach's Alpha (α)
Customer Satisfaction (CS)		0.681	0.895	0.842
CS1	0.730			
CS2	0.842			
CS3	0.863			
CS4	0.858			
Digital Literacy (DL)		0.783	0.935	0.908
DL1	0.875			
DL2	0.898			
DL3	0.882			
DL4	0.884			
Reliability (Rel)		0.801	0.942	0.917
Rel1	0.885			
Rel2	0.903			
Rel3	0.883			
Rel4	0.910			
Responsiveness (Res)		0.736	0.918	0.880
Res1	0.835			
Res2	0.890			
Res3	0.865			
Res4	0.841			

Source: *SmartPLS 4(v.4.1.1.8) construct reliability and validity output.*

The outer factor loading results ranged between 0.730 and 0.910. Furthermore, Cronbach's Alpha ranged between 0.842 and 0.917, indicating that the measurement model is reliable. At the same period, composite reliability (CR) values ranged from 0.895 to 0.942, while average variance extracted (AVE) ranged from 0.681 to 0.801. Thus, the measurement model has acceptable reliability and convergent validity.

4.2 Discriminant Validity

Discriminant validity was assessed using the Fornell–Larcker criterion. The square root of the AVE for each construct exceeded its correlations with the other constructs (Hair et al., 2019).

Table 3: Fornell–Larcker Criterion

Construct	CS	DL	Rel	Res
CS	0.825			
DL	0.482	0.885		
Rel	0.755	0.413	0.895	
Res	0.541	0.321	0.584	0.858

Source: *Obtain from SmartPLS 4(v.4.1.1.8) discriminant validity output*

The Fornell–Larcker results (table 3) confirm adequate discriminant validity because the diagonal values are greater than the corresponding inter-construct correlations. Heterotrait–Monotrait Ratio (HTMT) was also examined as a further test of discriminant validity. Values (see table 4) below 0.90 indicate satisfactory discriminant validity (Hair et al., 2019).

Table 4: Heterotrait–Monotrait Ratio (HTMT)

Construct	**CS**	**DL**	**Rel**	**Res**
CS	–			
DL	0.557	–		
Rel	0.849	0.445	–	
Res	0.623	0.353	0.649	–

Source: *Obtain from SmartPLS 4(v.4.1.1.8) discriminant validity output*

The HTMT values ranged from 0.353 to 0.849, remaining below the 0.90 threshold. This provides additional evidence that the constructs are empirically distinct.

4..3 Collinearity Assessment

Indicator-level VIF values were examined to assess potential collinearity. All values (table 5) were below the recommended threshold of 5.0 (Hair et al., 2019).

Table 5: Variance Inflation Factor (VIF) Assessment

Indicator	**VIF**	**Indicator**	**VIF**
DL1	2.438	Rel1	2.763
DL2	3.085	Rel2	3.183
DL3	2.890	Rel3	2.616
DL4	2.521	Rel4	3.348
Res1	1.873	CS1	1.487
Res2	2.843	CS2	2.073
Res3	2.435	CS3	2.158
Res4	2.155	CS4	2.109

Source: *SmartPLS 4(v.4.1.1.8) construct collinearity statistics (VIF) output*

The VIF values ranged from 1.487 to 3.348, indicating that collinearity was not a concern and that the indicators could be retained in the measurement model.

4.4 Coefficient of Determination (R^2)

The structural model explained 61.6% of the variance in customer satisfaction ($R^2 = 0.616$), with an adjusted R^2 of 0.611 (see table 6). The model therefore provides meaningful explanatory power for customer satisfaction in the sample.

Table 6: Coefficient of Determination (R^2)

Endogenous Construct	R^2	Adjusted R^2
Customer Satisfaction (CS)	0.616	0.611

Source: *Smartpls (v.4.1.1.8) R-Square output.*

The R^2 finding suggests that reliability, responsiveness, digital literacy, and interaction parameters contribute significantly to customer satisfaction variance. After accounting for the number of predictors, the close R^2 and modified R^2 values show a stable explanatory result.

4.5 Hypothesis Testing

Hypotheses were tested using bootstrapping in SmartPLS. Standardized path coefficients, t-values and p-values were used to assess the proposed relationships. Table 7 reports the results in three blocks. The first block gives the two direct paths, reliability and responsiveness. The second block gives the direct effect of digital literacy on satisfaction. The third block gives the two interaction terms that test H3 and H4. The decision column reports whether each hypothesis is supported at the conventional 5% level. All coefficients are standardized, so they can be compared in size. The comparison between the two interaction terms is the part of the table that matters most for the argument of the paper.

Table 7: Structural Path Coefficients and Hypothesis Testing

Hypothesis	Structural Path	Path Coefficient (β)	Sample Mean (M)	Standard Deviation (STDEV)	t-value	p-value	Decision
H1	Reliability → Customer Satisfaction	0.587	0.581	0.054	10.942	<0.001	Supported
H2	Responsiveness → Customer Satisfaction	0.123	0.121	0.044	2.769	0.006	Supported
—	Digital Literacy → Customer Satisfaction	0.118	0.123	0.042	2.810	0.005	Significant
H3	Reliability × Digital Literacy → Customer Satisfaction	0.263	0.270	0.051	5.113	<0.001	Supported
H4	Responsiveness × Digital Literacy → Customer Satisfaction	0.129	0.102	0.041	2.174	0.030	Supported

Source: *SmartPLS 4 (v.4.1.1.8) bootstrapping path coefficients output.*

The reliability of the service affects customer satisfaction positively and significantly (β = 0.587, t = 10.942, p < 0.001), thus supporting H1 (table 7). In turn, responsiveness has a positive and significant effect (β = 0.123, t = 2.769, p = 0.006), supporting H2. Finally, digital literacy has a positive direct impact on customer satisfaction (β = 0.118, t = 2.810, p = 0.005). The interaction between reliability and digital literacy has a positive and significant effect (β = 0.263, t = 5.113, p < 0.001), supporting H3. Likewise, the interaction between responsiveness and digital literacy is positive and significant (β = 0.129, t = 2.174, p = 0.030), supporting H4. Therefore, it can be observed that a higher level of digital literacy enhances the two relationships between service quality and customer satisfaction.

4.6 Model Fit Assessment

Model fit was assessed using SRMR and NFI. The results are presented in Table 8. The SRMR value of 0.065 is below 0.08 and the NFI value of 0.853 is above 0.80, indicating an acceptable model fit (Hair et al., 2019).

Table 8: Model Fit Assessment

Model Fit Index	Value	Recommended Threshold
SRMR	0.065	< 0.08
NFI	0.853	> 0.80

Source: *SmartPLS 4 (v.4.1.1.8) model fit output.*

4.7 Discussion

The findings demonstrate that both reliability and responsiveness are important predictors of customer satisfaction in digital banking contexts, but that they do not contribute equally to the outcome. Whereas reliability has the stronger direct effect (β = 0.587, p < .001), responsiveness too has a significant impact (β = 0.123, p = .006). The stronger influence of reliability fits well with the fundamental nature of digital banking: For any benefits to emerge from other service dimensions, transactional functions and account-related services must work seamlessly and consistently. The findings align with similar evidence concerning the importance of reliability in determining customer satisfaction in digital banking and in the domain of banking services more generally (Rahaman et al., 2020; Dam & Dam, 2021; Gazi et al., 2024). Aladwani (2024) also prioritizes reliability in internet banking. Responsiveness continues to be a vital driver of satisfaction because digital banking challenges demand rapid and effective solutions, a fit with the evidence on banking service quality (Sayoga & Anandya, 2025; Olowofela et al. 2024). Its weaker effect fits automated-channel evidence (Alshibly et al., 2024).

The moderation results represent the key insight of the study. The two interactions differ in strength, and this matters. Digital literacy exerts a significant positive influence on the reliability-customer satisfaction relation (β = 0.263, p < .001), as well as on the responsiveness-customer satisfaction link (β = 0.129, p = .030). Literate users gain more from reliability than from support. The difference in size is not small, and it has a plausible mechanism. Reliability is a property of the system itself. Digitally literate customers can observe that property directly, by checking balances, confirming transactions and using the platform without help. Responsiveness is a property of the support process. It becomes visible only when something goes wrong, and literate customers need it less often because they solve routine problems themselves. Their satisfaction therefore gains more from a dependable system than from faster support. This reading fits the chatbot evidence, where reliability predicted satisfaction but responsiveness did not (Alshibly et al., 2024). It also fits the broader pattern reported by Wagdi et al. (2026), where capability amplified the effect of service quality on satisfaction. An interpretation of these findings is consistent with research highlighting the role of digital capability in digital service adoption and customer experience (Khan et al., 2021; Bashir et al., 2023; Gazi et al., 2024; Kappil & Santhi, 2025).

The findings also suggest a more nuanced theoretical implication for the study. SERVQUAL captures why reliability and responsiveness are important service attributes, whereas ECT explains how successful service delivery can be translated into satisfaction. SERVQUAL supplies the attributes; ECT supplies the mechanism. The significant interaction effects contribute a customer-capability dimension to this relationship: In other words, enhancing service quality while improving customers' ability to engage with digital services complements rather than replaces one another. Capability and dependability are complements, not substitutes. For the banking sector in Bangladesh, this suggests that similar improvements in digital services could yield divergent satisfaction outcomes among customers with differing levels of digital literacy. Banks cannot assume uniform returns on service upgrades. This has a direct implication for theory. SERVQUAL dimensions act as conditional drivers, not fixed ones. ECT confirmation is partly skill-based. The two theories work better together than apart. SERVQUAL supplies the attributes and ECT supplies the mechanism. Digital literacy then sets how strongly that mechanism operates. The findings extend SERVQUAL and ECT in specific ways. Paltayian et al. (2026) validated SERVQUAL in e-banking. But it does not say how much satisfaction a given level

yields. The β = 0.263 interaction shows satisfaction is capability-dependent. ECT explains satisfaction as confirmed expectation (Ismail, 2023). Rahi and Abd. Ghani (2019) also extended ECT. Confirmation itself depends on the customer's ability to engage. Digital literacy is a boundary condition, not a replacement. The study therefore specifies when SERVQUAL and ECT effects are stronger.

5. Conclusion

This study investigated the influence of reliability and responsiveness on customer satisfaction in digital banking, as well as the moderating role of digital literacy in commercial bank customers in Bangladesh. Both service-quality dimensions have positive and significant effects, with reliability showing the strongest direct relationships. Digital literacy also has a positive direct effect and strengthens both the reliability-satisfaction and responsiveness-satisfaction relationships. As such, the findings highlight the importance of not only the quality of the digital banking platform and support it offers but also customers' ability to make the most of them. The study's main contribution was in its consideration of digital literacy as a boundary condition shaping the service quality-satisfaction relationships in the Bangladesh banking context. The contribution is a boundary-condition extension, clearly bounded. For practice, the recommendation would be to combine dependable digital infrastructure and responsive customer-support services with measures aimed at enhancing customers' digital capability. Such an approach would make digital banking more accessible to customers and help them navigate its complexities, reducing preventable service issues and improving their overall experience.

Theoretical Contributions

This study makes three theoretical contributions. The first concerns SERVQUAL. SERVQUAL identifies what customers evaluate in a service encounter. It does not explain how much satisfaction a given level of performance produces. The present results show that the same service quality does not translate into the same satisfaction for every customer. Reliability had a strong direct effect on satisfaction ($\beta = 0.587$, $p < .001$). Its effect became stronger when digital literacy was high ($\beta = 0.263$, $p < .001$). This interaction is the core theoretical point. It means that SERVQUAL dimensions behave as conditional rather than fixed drivers of satisfaction. Recent e-banking work still confirms the relevance of these dimensions (Aladwani, 2024; Paltayian et al., 2026). The present study adds a boundary condition to that confirmation. In doing so, it answers a question that SERVQUAL-based studies have largely left open, namely for whom service quality matters most. The second contribution concerns Expectation Confirmation Theory. ECT explains satisfaction as the outcome of comparing expectations with experienced performance. The theory has been extended into banking before (Ismail, 2023; Rahi & Abd. Ghani, 2019). Those extensions added new outcome variables or motivational factors. They did not examine whether the confirmation process itself depends on customer capability. The present study shows that it does. The reliability × digital literacy interaction ($\beta = 0.263$, $p < .001$) indicates that capable customers convert dependable performance into confirmed expectations more effectively. The responsiveness × digital literacy interaction ($\beta = 0.129$, $p = .030$) shows the same logic at a weaker level. Expectation confirmation in digital banking is therefore partly a capability-dependent process. This is a theoretical refinement, not a rejection, of ECT. It specifies the conditions under which ECT's predicted relationship is stronger or weaker. The third contribution concerns the integration of the two theories. The two theories are often named side by side but rarely joined into a single argument. This study treats them as complementary rather than parallel. SERVQUAL supplies the attributes that customers evaluate. ECT supplies the mechanism that turns evaluation into satisfaction. Digital literacy then acts as the boundary condition on that mechanism. Recent evidence supports this kind of integration. Wagdi et al. (2026) bridged SERVQUAL with the technology acceptance model and found that digital literacy moderated the service quality–satisfaction link. The present study extends that logic in two ways. First, it separates reliability from responsiveness and compares the two interaction effects. Second, it tests the model among commercial bank customers in Bangladesh, a setting where comparable moderation evidence remains scarce. The combined framework therefore offers a more precise

account of when service quality produces satisfaction. Taken together, these contributions move the literature from asking whether service quality matters to asking for whom and how strongly it matters. The study does not propose a new theory. It specifies the boundary conditions of two established theories and shows that customer capability is central to both. This is a modest but useful theoretical advance. It also gives future research a clear direction. Studies can test other capability variables, other service dimensions, and other national contexts against the same boundary-condition logic.

5.1 Managerial Implications

The results have implications for commercial banks and other stakeholders in Bangladesh. In terms of the former, it is critical to focus on such areas that enhance the reliability of digital services and minimize transaction mistakes and disruptions, as reliability has the strongest direct effect. The β = 0.587 effect supports this priority (Aladwani, 2024). The former also need to improve responsiveness by being more accessible to customers in charge of processing complaints and helping them resolve failed transactions promptly. The β = 0.123 effect makes support a baseline, not a lever. Another recommendation is to make digital services useful by providing customers with such resources as simplified guides, in-app assistance, training, and other services that help them get the most out of their interactions with the platform. Moderation analysis indicates that such an outcome may be achieved by making customers more capable of using the service when its usefulness is improved. The β = 0.263 interaction justifies pairing training with reliability. It is also advisable for commercial banks to consider the varied digital capabilities of their clients when designing digital services instead of focusing on a single level of skill. Wagdi et al. (2026) recommend the same segmentation strategy. Our results support that recommendation in the local setting. Training without reliable systems may not raise satisfaction much. Reliability without training may leave gains unused. The two investments work best together. This is why the reliability interaction is the strongest effect in the model. It is also why segmentation should follow literacy level, not account size. These recommendations are best read as a sequence rather than a list. The first step is to protect reliability, because its direct effect is the largest in the model (β = 0.587). The second step is to keep support responsive enough to handle failures, while accepting that its direct effect is smaller (β = 0.123). The third step is to raise digital literacy, because the reliability interaction (β = 0.263) shows that the return on the first step depends on customer capability. The responsiveness interaction (β = 0.129) is weaker, which means support improvements can follow later. Taken together, the sequence suggests that platform quality and customer capability should be developed in parallel, not one after the othe

5.2. Limitations and Future Research

This study has several limitations that also provide recommendations for future research. Three things cannot be claimed from these data. The design cannot establish causality, because all variables were measured at the same time. The sample cannot support national estimates, because it was not drawn as a probability sample. And the model cannot rule out omitted variables, because other service dimensions such as security and convenience were not included. These limits do not undermine the interaction findings, which concern the shape of a relationship rather than its level. They do mean that the results should be read as evidence about a mechanism, not as a market estimate. Additionally, this research only focused on reliability and responsiveness, leaving out other service-quality dimensions, such as security, privacy, convenience, and ease of use. Monir et al. (2025) include security and awareness. Future work could add these dimensions to the same boundary-condition model. It could also test other capability variables. Trust is an obvious candidate (Wagdi et al., 2026). So is prior experience with digital banking. Each would sharpen the picture this study begins. None would change its central logic. Future studies could build upon this research by including these constructs and investigating other customer-level moderators or mediators of the relationships. Additionally, longitudinal and multi-group studies could explore if the relationships are consistent across different segments and contexts.

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