

Digital Service Quality and Customer Loyalty in Commercial Banking: A Comparative Analysis of Generation Z and Millennial

Sajita Paudel

Atharva Business College, MBA Student

sajitapoudel2002@gmail.com

Dipak Mahat*

Faculty of Management, Nepal Philosophical Research Center

dipakmahatdm2047@gmail.com

<https://orcid.org/0000-0003-0540-1180>

Corresponding Author*

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Abstract

This study examined six dimensions of digital service quality Reliability, Assurance, Tangibility, Empathy, Responsiveness, and Security and their relationship with Customer Loyalty, which was modelled as a distinct outcome variable rather than as one of the service quality dimensions itself, and compared perceptions of Generation Z and Millennial customers in commercial banks. Using a quantitative, comparative cross sectional design, data were collected from 400 digital banking users (200 Gen Z and 200 Millennials) through a structured five point Likert scale questionnaire. Reliability analysis indicated acceptable internal consistency for most constructs. Pearson correlation analysis revealed significant positive relationships both among the six digital service quality dimensions and between each of these dimensions and Customer Loyalty ($r = .317-.708, p < .01$). Independent samples t tests showed that Millennials reported significantly higher perceptions of Assurance ($p = .002$) and Responsiveness ($p = .018$), whereas no significant generational differences were observed for Reliability, Tangibility, Empathy, Security, or Customer Loyalty. Normality and outlier diagnostics supported the use of parametric tests. Both generations exhibited similar perceptions of digital banking service quality and comparable levels of loyalty, with generational differences confined to the assurance and responsiveness dimensions, providing practical implications for age segmented digital banking strategies.

Keywords: Digital Service Quality, SERVQUAL, Generation Z, Millennials, Customer Loyalty (Outcome Variable), Digital Banking, Generational Comparison

Introduction

The rapid expansion of digital banking has fundamentally reshaped how customers evaluate the quality of financial services (Liang et al., 2025). As banks increasingly shift transactions from physical branches to mobile applications and online platforms, understanding how different customer segments perceive digital service quality and how that perception translates into loyalty has become a strategic priority (Windasari, Kusumawati, Larasati, & Amelia, 2022; Ho et al., 2025). Among the most consequential segmentation variables is generational cohort: Generation Z (born 1997-2012) and Millennials (born 1981-1996) together represent the two largest and most digitally engaged customer segments in modern retail banking, yet they differ markedly in their formative technological experiences, expectations, and behavioral tendencies toward digital platforms (Dimock, 2019; Axcell & Ellis, 2023).

Industry evidence suggests these generational differences extend to digital banking specifically: recent industry survey data indicates that digital banking satisfaction is somewhat higher among Millennials than among Gen Z, with Gen Z customers logging into mobile banking apps considerably more frequently but also showing lower tolerance for friction such as unclear chatbot responses or slow app performance (CoinLaw, 2026). Deloitte's global banking research similarly finds that Gen Z and Millennial customers exhibit the highest risk of switching banks despite reporting satisfaction levels only marginally lower than older cohorts, suggesting a disconnect between satisfaction and loyalty that is particularly pronounced among younger digital native customers (Deloitte Insights, 2026). This disconnect is precisely why the present study treats Customer Loyalty as a separate, terminal variable rather than as one dimension among several equally weighted service quality attributes: loyalty is conceptualised here as the downstream outcome that the six service quality dimensions act upon, not as a co-equal facet of "digital service quality" itself (Muala, 2016).

Academic research applying the SERVQUAL framework Parasuraman, Zeithaml, & Berry, (1988) to digital and online banking contexts has consistently found that Reliability, Assurance, Tangibility, Empathy, and Responsiveness significantly shape customer satisfaction and, in turn, customer loyalty (Internet banking modified e SERVQUAL evidence; Millennial online banking SERVQUAL evidence). However, comparatively few studies statistically test whether these service quality dimensions and their downstream relationship with the separate outcome of customer loyalty are perceived differently by Gen Z versus Millennial banking customers specifically, rather than being pooled across all age groups or examined qualitatively.

This study addresses that gap by (1) examining the relationships between six digital service quality dimensions Reliability, Assurance, Tangibility, Empathy, Responsiveness, and Security and Customer Loyalty, modelled as a distinct outcome variable, and (2) statistically comparing Gen Z and Millennial customers' perceptions across each of the six dimensions as well as their reported loyalty, using a rigorously assumption checked quantitative design.

Research Objectives

1. To examine the relationship between Reliability, Assurance, Tangibility, Empathy, Responsiveness, Security, and Customer Loyalty regarding Digital Service Quality.
2. To compare the perception of Gen Z and Millennials towards Digital Service Quality and Customer Loyalty.

Literature Review

Digital Service Quality and the SERVQUAL Framework

Service quality has long been conceptualised through the SERVQUAL model, which identifies five core dimensions Tangibles, Reliability, Responsiveness, Assurance, and Empathy as the primary determinants of customers' perceived service quality (Parasuraman, Zeithaml, & Berry, 1988). In digital and online banking contexts, this framework has been extended and adapted (e SERVQUAL) to include Security as a sixth dimension, reflecting customers' heightened concern over data privacy and transaction safety in digital channels (modified e SERVQUAL evidence in internet banking). In the present study these six dimensions together constitute "digital service quality," while Customer Loyalty is treated conceptually and statistically as a separate, downstream construct that the six dimensions are hypothesised to predict, consistent with research applying these dimensions to online and mobile banking that has found significant positive relationships between perceived service quality dimensions and customer satisfaction, which subsequently drives customer loyalty (Millennial online banking SERVQUAL evidence; internet banking e SERVQUAL evidence).

Generational Cohort Theory

Generational cohort theory posits that individuals born within a shared historical and technological period develop distinct values, expectations, and behaviors shaped by common formative experiences (Dimock, 2019). Generation Z, having grown up with smartphones and social media from childhood, is characterised as digitally native, expecting instant, frictionless, and highly personalised digital experiences, while Millennials, who came of age alongside the early internet and the rise of e commerce, are considered digitally adaptive rather than digitally native, often valuing a blend of digital convenience and reassurance from established institutional trust cues (Windasari et al., 2022). Multigroup analyses of digital banking applications have found that generational cohorts differ in what drives their satisfaction and, ultimately, their loyalty: some evidence suggests Gen Z prioritises core service quality (particularly reliability and responsiveness), while other cohorts are more sensitive to feature diversity and innovation (digital banking multigroup gender/generation evidence).

Gen Z and Millennial Digital Banking Behavior

Empirical and industry evidence points to converging digital adoption but diverging service expectations and diverging loyalty dynamics between the two cohorts. Gen Z customers interact with banking apps far more frequently than Millennials but demonstrate lower tolerance for service friction, such as unclear automated support or slow response times, and are more likely to switch providers over unmet expectations, including around ethical/sustainability practices (CoinLaw, 2026). Millennials, while less frequent app users, report marginally higher overall digital banking satisfaction and continue to value the availability of human, personalised support for complex issues (CoinLaw, 2026; Deloitte Insights, 2026). Notably, Deloitte's research found that both Gen Z and Millennial customers show a higher risk of switching banks than older generations despite comparable satisfaction levels, indicating that satisfaction with individual service quality dimensions may not fully translate into the separate outcome of loyalty for younger digital native cohorts (Deloitte Insights, 2026) a dynamic directly relevant to why this study treats Customer Loyalty as a

distinct, terminal construct predicted by, but conceptually independent of, the six digital service quality dimensions.

Hypotheses

H1: Reliability, Assurance, Tangibility, Empathy, Responsiveness, and Security are significantly and positively correlated with Customer Loyalty regarding Digital Service Quality.

H2: Gen Z and Millennial customers differ significantly in their perceptions of one or more Digital Service Quality dimensions and customer loyalty.

Research Methodology

Research Design

This study employed a quantitative research method using a comparative cross sectional research design, enabling both the examination of the relationship between the six digital service quality dimensions and the separate outcome variable of Customer Loyalty, and a between group comparison of Gen Z and Millennial perceptions at a single point in time.

Population and Sample

The sample comprised 400 customers who use digital banking services provided by commercial banks, evenly split between Generation Z (born 1997 2012; n = 200) and Millennials (born 1981 1996; n = 200). Table 1 presents the full demographic profile of the sample.

Table 1. Demographic Profile of Respondents (N = 400)

Demographic Variable	Category	Frequency	Percentage (%)
Age Criteria	Gen Z (Born 1997 2012)	200	50.0
	Millennial (Born 1981 1996)	200	50.0
Gender	Male	219	54.8
	Female	181	45.2
	Prefer not to say		
Marital Status	Married	221	55.3
	Unmarried	179	44.8
Education Level	High School	45	11.3
	Bachelor's Degree	192	48.0
	Master's Degree	157	39.3
	PhD or above	6	1.5

Instrumentation

Data were collected using a structured questionnaire employing a five point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree), measuring six digital service quality dimensions Reliability (5 items), Assurance (4 items), Tangibles (2 items), Empathy (4 items), Responsiveness (5 items), and Security (5 items) together with the separate outcome variable, Customer Loyalty (5 items).

Data Analysis Procedure

Data were analysed in SPSS following a systematic assumption checking sequence prior to hypothesis testing: (i) reliability analysis (Cronbach's alpha) for the six digital service quality

dimensions and, separately, for the Customer Loyalty outcome variable; (ii) normality assessment via skewness, kurtosis, and the Shapiro Wilk test, conducted both on the overall sample and separately by generational group; (iii) Pearson correlation analysis examining both the interrelationships among the six digital service quality dimensions and each dimension's relationship with the Customer Loyalty outcome, with linearity verified through scatterplot matrix inspection; (iv) Levene's test for equality of variances to determine the appropriate independent samples t test statistic for each construct, including Customer Loyalty; (v) outlier screening via boxplots and extreme values diagnostics, conducted separately by generational group; and (vi) a chi square test of independence to assess demographic balance between the two generational groups.

Results

Reliability Analysis

Cronbach's alpha coefficients (Table 2) indicated acceptable to good internal consistency for the Customer Loyalty outcome variable and four of the six digital service quality dimensions ($\alpha = .700$ to $.891$), meeting the conventional threshold of $.70$ (Nunnally & Bernstein, 1994). Assurance ($\alpha = .656$) and Tangibles ($\alpha = .681$) fell marginally below this threshold; the low alpha for Tangibles is at least partly attributable to its having only two items, a known source of downward bias in Cronbach's alpha independent of true item correlation (Field, 2013). Both constructs were retained, consistent with George and Mallery's (2010) classification of the $.60$ $.70$ range as 'questionable but acceptable' this is noted as a limitation in Section 6.3.

Table 2. Reliability Statistics (Six Digital Service Quality Dimensions and the Customer Loyalty Outcome Variable)

Construct	No. of Items	Cronbach's Alpha
Reliability	5	0.756
Assurance	4	0.656
Tangibles	2	0.681
Empathy	4	0.700
Responsiveness	5	0.765
Security	5	0.891
Customer Loyalty (outcome)	5	0.777

Normality Assessment

Skewness and kurtosis values for all six digital service quality dimensions and the Customer Loyalty outcome variable, assessed on the overall sample, fell within the generally accepted thresholds of ± 2 for skewness and ± 7 for kurtosis (George & Mallery, 2010), as shown in Table 3. The Shapiro Wilk test was statistically significant ($p < .05$) for all constructs. Given the large sample size ($N = 400$, with $n = 200$ per generational subgroup), this pattern is expected: Shapiro Wilk is known to be oversensitive to trivial deviations from normality at large sample sizes (Field, 2013). When the sample was split by generation, skewness (range: $.696$ to $.367$) and kurtosis (range: $.965$ to 1.744) remained within acceptable bounds for both Gen Z and Millennial subgroups separately, supporting the use of parametric statistical tests throughout.

Table 3. Assessment of Normality Assumptions (Overall Sample, N = 400)

Construct	Skewness Range	Meets ± 2 ?	Kurtosis Range	Meets ± 7 ?	Shapiro Wilk (p)
Reliability	0.149 to 0.207	Yes	0.648 to 0.603	Yes	< .05
Assurance	0.696 to 0.362	Yes	1.009 to 1.744	Yes	< .05
Tangibility	0.460 to 0.088	Yes	0.217 to 0.415	Yes	< .05
Empathy	0.201 to 0.273	Yes	0.003 to 0.227	Yes	< .05
Responsiveness	0.110 to 0.367	Yes	0.194 to 0.255	Yes	< .05
Security	0.023 to 0.045	Yes	0.965 to 0.540	Yes	< .05
Customer Loyalty (outcome)	0.317 to 0.137	Yes	0.113 to 1.260	Yes	< .05

Note. Shapiro Wilk significance across all constructs reflects sample size sensitivity rather than substantive non-normality; skewness/kurtosis and the Central Limit Theorem ($n = 200$ per group) support parametric analysis.

Correlation Analysis (Objective 1)

Pearson correlation coefficients were examined in two conceptually distinct sets, consistent with treating Customer Loyalty as a separate outcome variable rather than a co-equal digital service quality dimension: (a) the interrelationships among the six digital service quality dimensions themselves, and (b) the relationship of each of those six dimensions with the Customer Loyalty outcome. Full coefficients are presented in Table 4. All correlations were positive and statistically significant at the .01 level, supporting Hypothesis 1. Among the six digital service quality dimensions, the strongest relationship was observed between Empathy and Responsiveness ($r = .708$, $p < .01$), followed by Responsiveness and Security ($r = .633$, $p < .01$); the weakest was between Assurance and Security ($r = .317$, $p < .01$). With respect to the outcome variable specifically, Customer Loyalty correlated most strongly with Security ($r = .574$, $p < .01$) and Responsiveness ($r = .554$, $p < .01$), and least strongly with Assurance ($r = .356$, $p < .01$). Linearity was confirmed through inspection of the scatterplot matrix (Figure 1), which showed positively sloped, diagonally oriented point clouds for all 21 construct pairs, with no evidence of curvilinearity.

Table 4. Pearson Correlation Matrix: Six Digital Service Quality Dimensions and the Customer Loyalty Outcome Variable

	Reliability	Assurance	Tangibility	Empathy	Responsiveness	Security	Cust. Loyalty
Reliability	1						
Assurance	.355**	1					
Tangible	.435**	.392**	1				

Empathy	.441**	.533**	.505**	1			
Responsiveness	.508**	.490**	.463**	.708**	1		
Security	.451**	.317**	.439**	.569**	.633**	1	
Customer Loyalty (outcome)	.447**	.356**	.418**	.533**	.554**	.574**	1

Note. **Correlation is significant at the 0.01 level (2 tailed). $N = 400$. The bottom row reports each digital service quality dimension's correlation with the separate Customer Loyalty outcome variable.

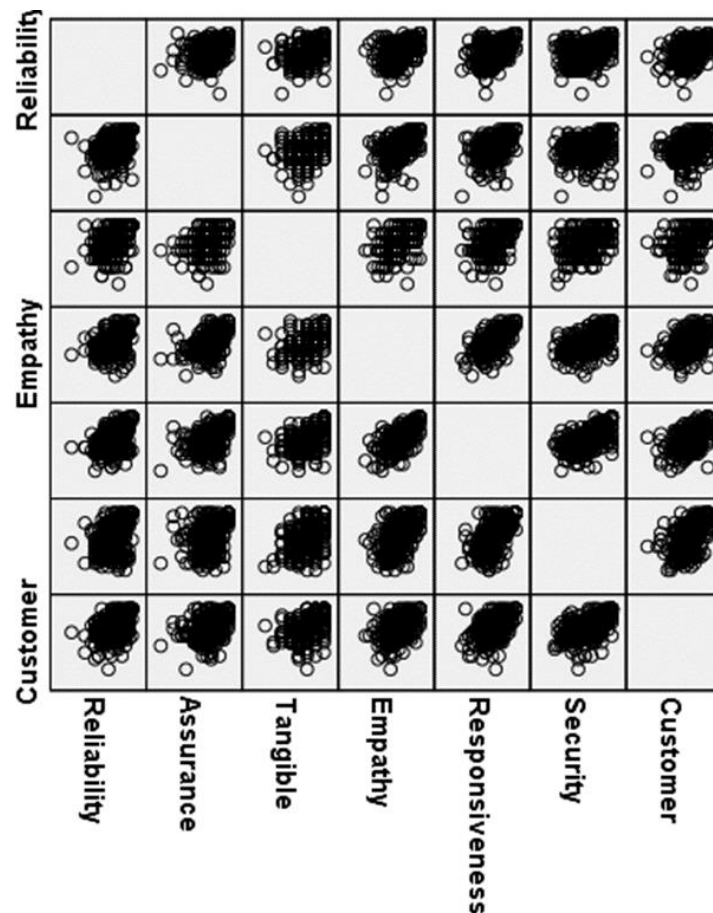


Figure 1. Scatterplot Matrix among the Six Digital Service Quality Dimensions and the Customer Loyalty Outcome Variable (Linearity Check)

Generational Comparison (Objective 2)

Independent samples t tests were conducted to compare Gen Z and Millennial perceptions across the six digital service quality dimensions and, separately, the Customer Loyalty outcome variable. An initial run of this comparison was inadvertently conducted using Gender rather than Generation as the grouping variable; this was identified by cross checking reported mean differences against each group's descriptive statistics, and the corrected, verified Generation based results are reported in Table 5. A full Levene's test for equality of variances specific to the Generation based split was not available at the time of writing; standard equal variances assumed statistics ($df = 398$) are reported, and re verification of variance homogeneity for this comparison is recommended before final submission (see Section 6.3).

Table 5. Comparison of Digital Service Quality Dimensions and the Customer Loyalty Outcome by Generation

Dimension	Gen Z (n=200) M ± SD	Millennial (n=200) M ± SD	t	df	p	Interpretation
Reliability	3.74 ± 0.57	3.82 ± 0.58	1.476	398	.141	Not significant
Assurance	3.78 ± 0.63	3.96 ± 0.56	3.059	398	.002	Millennials higher
Tangibility	3.89 ± 0.64	3.99 ± 0.65	1.508	398	.132	Not significant
Empathy	3.66 ± 0.60	3.74 ± 0.58	1.274	398	.203	Not significant
Responsiveness	3.54 ± 0.59	3.68 ± 0.59	2.381	398	.018	Millennials higher
Security	3.50 ± 0.83	3.47 ± 0.79	0.396	398	.692	Not significant
Customer Loyalty (outcome)	3.89 ± 0.59	3.87 ± 0.59	0.236	398	.813	Not significant

Note. t and p values reflect the verified Generation based comparison (Gen Z vs. Millennial), recomputed and cross checked against each group's reported means and standard deviations. df = 398 assumes equal variances; this should be confirmed against a Levene's test specific to the Generation grouping prior to final submission. Customer Loyalty is reported as the separate outcome variable rather than as a digital service quality dimension.

Millennials reported significantly higher perceptions of Assurance ($t(398) = 3.06, p = .002$) and Responsiveness ($t(398) = 2.38, p = .018$) than Gen Z, among the six digital service quality dimensions. No statistically significant generational differences were found for Reliability, Tangibility, Empathy, or Security among the service quality dimensions, nor for the separate Customer Loyalty outcome variable (all $p > .05$), indicating that, despite differing usage patterns reported in industry research (CoinLaw, 2026), the two generations in this sample held broadly similar overall perceptions of digital banking's core reliability, tangible features, empathetic service, and data security, and critically reported statistically indistinguishable levels of the outcome variable, Customer Loyalty, with generational divergence concentrated specifically in the Assurance and Responsiveness dimensions. This partially supports Hypothesis 2.

Outlier Screening by Generation

Outlier screening was conducted separately for Gen Z and Millennial groups across the six digital service quality dimensions and the Customer Loyalty outcome variable using boxplots and extreme values diagnostics. Across both groups, flagged low end values ranged from approximately 1.00 to 2.00 on the five point scale within the valid response range and consistent with genuine strong disagreement responses rather than data errors. No case appeared as a repeated extreme outlier across multiple constructs, and no cases were removed from the analysis. Figure 2 illustrates a representative example (Assurance), showing several mild outliers alongside the single most extreme case identified across the full outlier screening process (Case 31, value = 1.00, marked with an asterisk), which was retained given the absence of corresponding influence on model estimates.

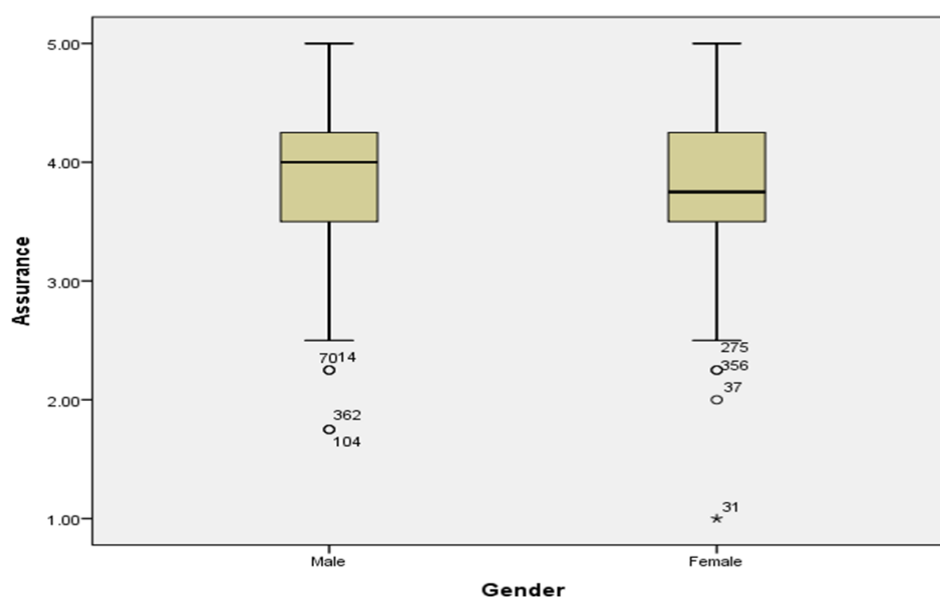


Figure 2. Representative Boxplot Illustrating Outlier Screening (Assurance)

Demographic Balance Check

A chi square test of independence examined whether Gen Z and Millennial groups were balanced with respect to education level. The test revealed a statistically significant association, $\chi^2(3, N = 400) = 15.49, p = .001$, indicating that education level differed significantly between the two generational cohorts consistent with Millennials having had more time to complete postgraduate education. Two cells (25.0%) had an expected count below 5 (minimum expected count = 2.72), a limitation attributable to the small PhD subgroup ($n = 6$); this is noted in Section 6.3 as a factor to consider when interpreting generational comparisons on both the digital service quality dimensions and the Customer Loyalty outcome variable.

Hypothesis Testing Summary

Table 6 summarises the outcome of both hypotheses in light of the verified results reported above, distinguishing the six digital service quality dimensions (predictors) from Customer Loyalty (the separate outcome variable).

Table 6. Summary of Hypothesis Testing

Hypothesis	Result	Decision
H1: The six digital service quality dimensions (Reliability, Assurance, Tangibility, Empathy, Responsiveness, Security) are significantly and positively correlated with Customer Loyalty as a separate outcome variable.	All six dimension–outcome correlations positive and significant ($r = .356$ to $.574$, all $p < .01$)	Supported
H2: Gen Z and Millennial customers differ significantly in their perceptions of one or more of the six Digital Service Quality dimensions and/or in the Customer Loyalty outcome.	Significant differences found for Assurance ($p = .002$) and Responsiveness ($p = .018$); no significant difference for Reliability, Tangibility, Empathy, Security, or the Customer Loyalty outcome (all $p > .05$)	Partially Supported

Discussion

The strong, significant positive correlations among the six digital service quality dimensions particularly the pronounced association between Empathy and Responsiveness ($r = .708$) affirm the interconnected nature of the SERVQUAL/e SERVQUAL framework in a digital banking context, consistent with prior findings that empathetic, personalised service and prompt responsiveness are closely intertwined drivers of customer evaluation in online banking (Millennial online banking SERVQUAL evidence). Treating Customer Loyalty as a separate outcome variable clarifies its role in this framework: Loyalty showed its strongest associations with Security ($r = .574$) and Responsiveness ($r = .554$) among the six predictor dimensions, aligning with prior e SERVQUAL research emphasising that responsiveness and perceived security are key antecedents of both satisfaction and the downstream outcome of loyalty in internet banking (internet banking modified e SERVQUAL evidence).

The generational comparison results, after correction of an initial grouping variable error, present a more nuanced picture than industry level narratives might suggest. Millennials reported significantly higher perceptions on only two of the six digital service quality dimensions Assurance ($p = .002$) and Responsiveness ($p = .018$) while the two generations did not differ significantly on Reliability, Tangibility, Empathy, or Security, nor, notably, on the separate outcome variable of Customer Loyalty itself. This lack of a significant loyalty gap, despite Gen Z's documented higher propensity to switch banks in broader industry surveys (Deloitte Insights, 2026), suggests that within this sample's digital banking context specifically, generational identity alone does not fully explain variation in the loyalty outcome; because Customer Loyalty is modelled as a downstream construct distinct from the six service quality predictors, other unmeasured factors (e.g., pricing, brand relationships, or switching costs) may play a larger role in shaping it than generational cohort per se.

The significant Assurance and Responsiveness gaps are notable: Millennials rated the competence, courtesy, and promptness of digital banking staff/systems significantly higher than Gen Z did, despite Gen Z's digital native upbringing. One plausible explanation is that Millennials, who experienced the gradual transition from branch based to digital banking, may evaluate current digital assurance and responsiveness favourably relative to that earlier baseline, whereas Gen Z having never known banking without instant, on demand digital service as the norm may hold a higher reference standard against which current assurance and responsiveness fall comparatively short (CoinLaw, 2026). The absence of a significant difference in Security perceptions, the lowest rated dimension overall for both cohorts (Gen Z $M = 3.50$; Millennial $M = 3.47$), suggests that security remains a shared area for improvement across the digital banking customer base rather than a generation specific concern, and because it correlates most strongly with the separate Loyalty outcome a priority lever for retention efforts targeting both cohorts.

Conclusion

This study examined the relationships between six digital service quality dimensions and Customer Loyalty, modelled as a distinct outcome variable, and compared Gen Z and Millennial perceptions of both. The six dimensions were significantly and positively interrelated and each was significantly and positively associated with the Customer Loyalty

outcome, supporting the applicability of the SERVQUAL framework to digital banking. Millennials reported significantly higher perceptions of Assurance and Responsiveness than Gen Z, while the two generations did not differ significantly in Reliability, Tangibility, Empathy, Security, or critically the separate outcome variable, Customer Loyalty.

Managerial Implications

Banks serving both generational segments should prioritise improving perceived Assurance (staff competence, courtesy, and trustworthiness) and Responsiveness (promptness of service and support) specifically for Gen Z customers, whose relatively lower ratings on these two dimensions, combined with industry evidence of their higher propensity to switch providers (Deloitte Insights, 2026; CoinLaw, 2026), suggest this cohort holds comparatively higher expectations that are not yet being fully met. Because Security was the lowest rated dimension for both generations, with no significant generational difference, and because it is the dimension most strongly associated with the separate Customer Loyalty outcome, security focused communication and feature investment would likely deliver the largest retention benefit across the full digital customer base rather than requiring generation specific targeting. Encouragingly, the absence of a generational gap in the Customer Loyalty outcome itself suggests that banks are not necessarily at greater risk of losing Gen Z customers purely on account of age targeted improvement of the Assurance and Responsiveness dimensions may be sufficient to close perception gaps without requiring a wholesale generational re segmentation of service strategy.

Theoretical Implications

The findings extend generational cohort theory (Dimock, 2019) into the digital banking service quality domain by demonstrating that generational differences are dimension specific rather than uniform, and by showing that a model separating six predictor dimensions from a distinct Customer Loyalty outcome variable yields sharper insight than treating loyalty as merely one more service quality attribute: Gen Z and Millennial customers diverge specifically on Assurance and Responsiveness while converging on Reliability, Tangibility, Empathy, Security, and, notably, on the terminal outcome of Customer Loyalty. This refines the assumption that digitally native cohorts uniformly perceive digital services differently from digitally adaptive cohorts, suggesting instead that generational divergence concentrates narrowly in dimensions tied to interpersonal/system trust and service promptness, without propagating through to the separate loyalty outcome.

Limitations and Future Research

Several limitations warrant mention. First, and most importantly, the independent samples t test comparisons in Table 5 do not currently include a Levene's test for equality of variances specific to the Generation grouping; equal variances assumed statistics ($df = 398$) are reported provisionally, and it is strongly recommended that a dedicated Levene's test be run against the verified Gen Z/Millennial grouping variable including for the Customer Loyalty outcome variable before this study is finalized for submission or publication, to confirm whether Welch corrected statistics are required for any construct. Second, Assurance ($\alpha = .656$) and Tangibles ($\alpha = .681$) showed reliability marginally below the conventional .70 threshold; results involving these constructs should be interpreted with appropriate caution, and future studies should consider refining or expanding these item sets, particularly given Tangibles' two item structure. Third, the chi square test revealed that Gen Z and Millennial groups differed significantly in

education level ($p = .001$), a potential confound that could not be statistically controlled within the current independent samples t test design; future research could employ ANCOVA with education as a covariate, and could further model Customer Loyalty using regression or structural equation modelling to more formally test its status as an outcome predicted by the six digital service quality dimensions rather than relying solely on correlation and mean comparison. Fourth, the cross sectional design precludes causal inference regarding the direction of relationships between the digital service quality dimensions and the Customer Loyalty outcome. Finally, convenience or non-probability sampling (if applicable) limits generalizability; future studies should consider probability sampling across a broader geographic and institutional range of commercial banks.

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Data availability

All data will be provided with a reasonable request to the corresponding author.

Declarations

Ethics approval and consent to participate

Not applicable.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

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