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When App Quality is Not Enough Perceived Value, Satisfaction and Loyalty in Student Digital Payments

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Abstract: This study examines how digital-payment application quality, perceived value and satisfaction relate to loyalty among students, a strategically important but underexamined segment of India's platform-payment economy.

Cross-sectional questionnaire data from 408 students in Bengaluru were analysed using exploratory factor analysis and covariance-based structural equation modelling. The paper re-evaluates the reported direct and indirect effects against conventional significance and model-validity criteria.

Application quality predicted perceived value ($\beta = 0.452, p < 0.001$) and satisfaction ($\beta = 0.444, p < 0.001$), but not loyalty directly ($\beta = 0.003, p = 0.092$). Perceived value predicted both satisfaction ($\beta = 0.221, p < 0.001$) and loyalty ($\beta = 0.362, p < 0.001$), while satisfaction predicted loyalty ($\beta = 0.240, p < 0.001$). The measurement model was adequate but not strong ($\chi^2/\mathrm{df} = 3.026$, CFI = 0.919, RMSEA = 0.060). Several constructs had average variance extracted below 0.50, and bootstrap results did not provide conventional evidence for the proposed mediation paths..

The study identifies a quality–loyalty paradox in student payments: sound functionality is necessary for positive evaluations but insufficient for loyalty. The paper also shows the value of auditing hypothesis decisions and measurement quality before converting an academic project into a journal submission.

Keywords: mobile payment, UPI, app quality, perceived value, user satisfaction, loyalty, students, India
JEL classification: D12, G21, M31, O33

1. Introduction

Mobile payments have moved from a peripheral banking service to everyday infrastructure. In India, the Unified Payments Interface (UPI) links regulated accounts, interoperable rails and competing applications at large scale (National Payments Corporation of India *[NPCI], 2026)*. This architecture makes adoption easy to observe but loyalty difficult to explain: users may switch interfaces while retaining the same underlying account and payment rail.

Students are an analytically important segment. They are intensive smartphone users, transact frequently in low values and are exposed to cashback, peer effects and rapidly changing interfaces. At the same time, constrained budgets and uneven financial literacy can heighten sensitivity to failed transactions, privacy, overspending and grievance resolution. A technically capable application may therefore create satisfaction without creating durable allegiance.

Prior research links electronic-service quality to value, satisfaction and behavioural intentions *(Kuo et al., 2009; Xu et al., 2015)*. In the Indian mobile-wallet context, *Ellaturu et al. (2024)* specifically positioned perceived value and satisfaction between wallet quality and loyalty. Technology-acceptance models emphasise usefulness and ease of use *(Davis, 1989; Venkatesh et al., 2003)*, while loyalty research treats satisfaction and perceived value as central post-adoption evaluations *(Oliver, 1999; Zeithaml, 1988)*. Yet these streams are often tested as an unbroken quality-to-loyalty chain. In interoperable payment markets, that assumption deserves scrutiny.

This paper analyses survey evidence from 408 students in Bengaluru. It asks whether application quality directly predicts loyalty, whether perceived value and satisfaction provide stronger explanatory paths, and whether the proposed indirect effects withstand conservative statistical interpretation. Its central contribution is the quality–loyalty paradox: quality produces favourable evaluations, but loyalty depends on the

value students experience and the satisfaction they retain.

2. Theory and Hypothesis

2.1. Application quality and post-adoption evaluation

Information-systems success research distinguishes system and service quality from user satisfaction and net benefits *(DeLone & McLean, 2003)*. In mobile payments, quality is experienced through reliability, security, speed, usability, support and transaction completion. These attributes can reduce effort and uncertainty, increasing the value users perceive and their satisfaction with the service.

2.2. Perceived value, satisfaction and loyalty

Perceived value represents the overall trade-off between benefits and monetary, effort, time and risk costs *(Zeithaml, 1988)*. Satisfaction is a cumulative evaluation of whether experience meets expectations, whereas loyalty reflects a commitment to continue or recommend despite alternatives *(Oliver, 1999)*. In a low-switching-cost platform market, value and satisfaction may matter more to loyalty than technical quality alone.

2.3. Hypotheses

- H1: Payment-application quality is positively associated with user loyalty.
- H2: Payment-application quality is positively associated with perceived value.
- H3: Payment-application quality is positively associated with user satisfaction.
- H4: Perceived value is positively associated with user loyalty.
- H5: Perceived value is positively associated with user satisfaction.
- H6: User satisfaction is positively associated with user loyalty.
- H7: Perceived value mediates the association between application quality and loyalty.
- H8: Satisfaction mediates the association between application quality and loyalty.
- H9: Perceived value and satisfaction serially mediate the association between application quality and loyalty

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3. Method

3.1. Design and participants

The study used a cross-sectional, structured questionnaire administered to 408 students in Bengaluru. Women represented 59.1% of respondents (n = 241). The largest age category was 21–25 years (n = 210; 51.5%), followed by 15–20 years (n = 125; 30.6%) and 26–30 years (n = 73; 17.9%). Postgraduate students formed the largest educational group (n = 198; 48.5%). The source records do not fully document the sampling frame or probability-selection procedure; the sample should therefore be treated as non-probability evidence.

3.2. Measures and analysis

The instrument operationalised application quality, perceived value, satisfaction, and loyalty, with quality represented through security, service quality, service performance, trust, and convenience indicators. Exploratory factor analysis was followed by covariance-based structural equation modelling. Reliability was evaluated using composite reliability (CR), convergent validity using average variance extracted (AVE), and model fit using χ^2/df, CFI, and RMSEA. Direct paths were assessed at $\alpha = 0.05$; indirect effects were interpreted from bootstrap intervals and reported p-values. Where these indicators conflicted, the conclusion was classified as inconclusive rather than significant.

Table 1: Respondent profile (n = 408)

Characteristic	Category	n	%
Gender	Female / Male	241 / 167	59.1 / 40.9
Age	15–20 / 21–25 / 26–30	125 / 210 / 73	30.6 / 51.5 / 17.9
Education	PG / Graduate / Other	198 / 106 / 104	48.5 / 26.0 / 25.5

3.3. Research integrity

The present manuscript uses the numerical results recorded in the supplied project report. No observations or model estimates were fabricated. The hypothesis decisions were recalculated from the reported statistics, and ambiguous mediation output was explicitly retained as a limitation. Before submission, the authors should confirm ethics approval, consent wording, item scales, software version, sampling procedure and the original dataset.

4. Results

4.1. Measurement quality

The measurement model returned $\chi^2 = 553.846$ with 183 degrees of freedom, $\chi^2/\mathrm{df} = 3.026$, CFI = 0.919, and RMSEA = 0.060. These values indicate adequate rather than excellent fit. The significant close-fit test (PCLOSE = 0.003) does not support a claim of exact close fit. Composite reliability exceeded 0.70 for every construct, but AVE was below 0.50 for safety/security, perceived value, service quality, trust, and service performance; convergent validity is therefore uneven.

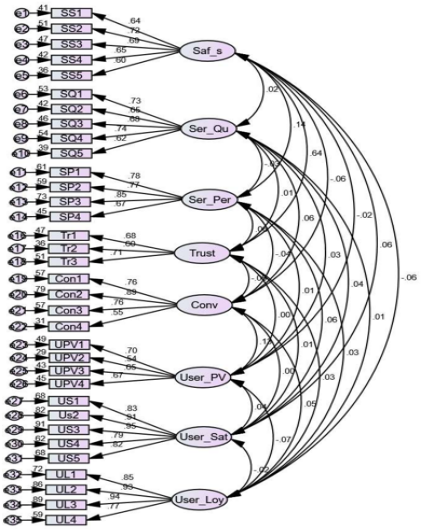

Figure 1: Original SEM measurement model retained from the project report

Table 2: Reliability and convergent validity

Construct	CR	AVE	Interpretation
Safety and security	.794	.437	Reliable; AVE low
Perceived value	.738	.415	Reliable; AVE low
Satisfaction	.934	.741	Strong
Loyalty	.928	.764	Strong
Service quality	.814	.468	Reliable; AVE low
Service performance	.915	.686	Strong
Trust	.705	.445	Borderline; AVE low
Convenience	.833	.561	Adequate

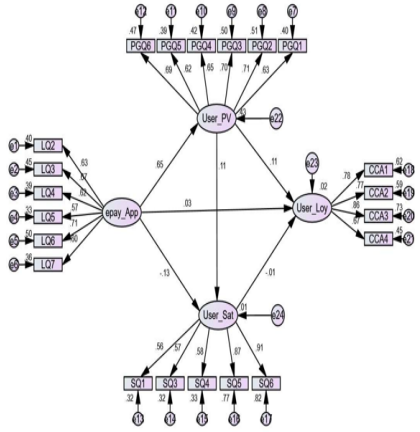

Figure 2: Experimental prototype of Proposed system

Table 3: Direct structural effects and corrected decisions

Hypothesis / path	β	p	Decision
H1 Quality → loyalty	.003	.092	Not supported
H2 Quality → perceived value	.452	< .001	Supported
H3 Quality → satisfaction	.444	< .001	Supported
H4 Perceived value → loyalty	.362	< .001	Supported
H5 Perceived value → satisfaction	.221	< .001	Supported
H6 Satisfaction → loyalty	.240	< .001	Supported

4.2. Indirect effects

The bootstrap output does not establish the proposed mediations at the conventional 5% level. The perceived-value indirect path is borderline (p = .099; lower confidence bound reported as .000), the satisfaction path is non-significant, and the serial path includes zero. One additional source row reports a quality → perceived value → satisfaction interval above zero but p = .088; because the interval and p value conflict, it is not treated as evidence of mediation.

5. Discussion

5.1. The quality–loyalty paradox

The results separate technical evaluation from relational commitment. Application quality is consequential because it raises both perceived value and satisfaction. Yet quality's direct association with loyalty is effectively zero. This qualifies the mediated quality–loyalty logic advanced by Ellaturu et al. (2024): in an interoperable ecosystem, baseline speed, security and usability may be expected rather than differentiating. Students can receive acceptable quality from several applications, allowing loyalty to migrate toward whichever interface currently offers greater convenience, rewards, social acceptance or problem resolution.

5.2. Why perceived value matters

Perceived value has the largest direct coefficient for loyalty and also contributes to satisfaction. This is consistent with value-based models in which benefits are judged against time, effort, risk and monetary costs (Kuo et al., 2009; Zeithaml, 1988). For students, value may include low-friction transfers, merchant acceptance, transparent charges, fast refunds and control over spending—not merely cashback.

Table 4: Conservative interpretation of indirect effects

Hypothesis / indirect path	Std. effect	95% CI	p	Decision
H7 Quality → value → loyalty	.073	.000 to .142	.099	Not supported / borderline
H8 Quality → satisfaction → loyalty	.001	−007 to .011	.828	Not supported
H9 Quality → value → satisfaction → loyalty	.070	−007 to .004	.764	Not supported

5.3. Satisfaction without proven mediation

Satisfaction predicts loyalty, but the reported indirect effects do not statistically carry quality into loyalty. This distinction is important. Significant component paths do not automatically establish an indirect effect; mediation requires the product term and its bootstrap interval to be evaluated directly (Hayes, 2022). The present data support an evaluative pathway in theory, but the recorded bootstrap output cannot confirm it.

5.4. Measurement implications

The adequate CFI and RMSEA support cautious structural interpretation, while sub-.50 AVE values signal construct overlap or weak indicators. Security, trust and service dimensions may be too fragmented for a single higher-order quality construct. Future studies should purify items, report standardised loadings and residuals, test discriminant validity through HTMT, and validate the model in a separate sample.

6. Implications

6.1. Managerial implications

- Compete on recoverable value, not feature parity: prioritise failed-transaction resolution, refund visibility, clear limits and responsive human support.
- Make security legible: explain permissions, authentication and grievance routes in student-friendly language without normalising risky shortcuts.
- Build financial self-control tools, including spend summaries, optional budgets, subscription reminders and transparent reward conditions.
- Treat loyalty metrics cautiously. Repeat use may reflect merchant acceptance or a default UPI handle rather than genuine commitment; combine behavioural data with satisfaction, recommendation and switching-intention measures.

6.2. Policy and university implications

The RBI and NPCI emphasis on secure, inclusive digital payments should be complemented by campus-level digital-financial literacy. Universities can teach fraud recognition, responsible credit use, privacy settings and formal complaint channels. Providers should make grievance escalation accessible to young users and publish resolution times for failed or disputed transactions.

7. Conclusion,Limitations and, Future Scope

This study shows that payment-app quality is not synonymous with loyalty. Among 408 Bengaluru students, quality strongly predicts value and satisfaction, while value and satisfaction directly predict loyalty. The direct quality–loyalty path and proposed mediation effects are not supported by the recorded output. The publishable insight is therefore a boundary condition: in interoperable digital-payment markets, quality may be necessary but insufficient for commitment.

The study is cross-sectional, self-reported and restricted to one city and student segment. The sampling frame and administration process require fuller documentation; several constructs have AVE below .50; common-method bias was not formally assessed; and parts of the mediation table contain internal inconsistencies. These limitations preclude causal claims.

Future work should preregister the model, use probability or quota sampling across cities, separate predictors and outcomes temporally, and link survey responses to consented behavioural indicators. Multi-group tests could examine gender, education and payment intensity. Competing-app designs should distinguish loyalty to an interface from loyalty to the UPI ecosystem, bank or merchant network.

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