International Journal of Engineering Science and Advanced Technology (IJESAT)
Vol 25 Issue 12(December),2025
Received: 27-10-2025 Accepted: 09-12-2025 Published: 16-12-2025

THE ECONOMICS OF SUPER-APPS: MANAGERIAL STRATEGIES FOR RETENTION AND CROSS-SELLING

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ABSTRACT
Super-apps, integrated digital platforms combining payments, commerce, mobility, and financial services, have emerged as a dominant platform strategy, yet empirical evidence on the managerial drivers of retention and cross-selling remains limited. This study examines how key managerial levers, AI-driven personalization, engagement architecture, bundling strategies, trust-building mechanisms, and network effects, shape user retention and cross-vertical adoption in super-app ecosystems. Drawing on platform economics and behavioral theory, we develop and test an integrated conceptual model using survey and behavioral data from 602 active super-app users in an emerging market. A dual structural equation modeling approach is employed, combining variance-based PLS-SEM for predictive analysis with covariance-based SEM for model validation. The results show that personalization is the primary economic driver, operating through perceived relevance to significantly enhance both retention and cross-selling. Bundling strategies exert the strongest indirect effect on cross-selling by expanding multi-service adoption, while engagement architecture promotes habitual use that strengthens retention. Trust and platform confidence directly influence spending and long-term loyalty, and network effects operate mainly through perceived platform value rather than structural scale alone. The findings demonstrate that managerial levers function as measurable economic assets within super-app ecosystems. The study advances theory by integrating platform economics with behavioral mechanisms and offers actionable guidance for designing, governing, and optimizing super-apps to maximize sustained user value and cross-vertical monetization.

Keywords: Bundling, digital platform, managerial levers, personalization, platform economics.

I. INTRODUCTION

The rise of super-apps, single mobile platforms that integrate payments, messaging, commerce, mobility, and financial services, represents a major shift in digital platform strategy (Hasselwander, 2024). By transforming stand-alone services into multi-service ecosystems, super-apps capture user attention and transaction flows through convenience, seamless data integration, and coordinated user journeys (van der Vlist et al., 2024). This integration reduces search and switching costs while enabling firms to cross-sell additional services to engaged users, strengthening lifetime value (Kim et al., 2025).

From an economic and strategic perspective, super-apps reshape value creation and capture. Platform architecture and governance determine how network effects, complementarities, and switching costs are generated and monetized (Nerbel & Kreutzer, 2023). Empirical evidence shows that credible digital platform strategies positively influence firm valuation, indicating that financial markets reward ecosystem-building initiatives (Schreieck et al., 2024). Managers therefore face a dual challenge: designing pricing and product architectures that stimulate multi-service usage while safeguarding user experience, privacy, and regulatory compliance across diverse services (Chiruvelli, 2025).

Despite widespread adoption, research on the managerial drivers of retention and cross-selling in super-apps remains limited. Existing studies primarily examine diffusion patterns, platform typologies, adoption determinants, and governance structures (Panwar & Khan, 2025). However, fewer studies directly connect specific managerial levers, such as service bundling, personalization, loyalty programs, and API governance, to measurable retention and cross-vertical conversion outcomes (Khan & Panwar, 2025). This gap constrains actionable guidance for managers allocating resources across acquisition, engagement, and ecosystem expansion.

Accordingly, this study examines managerial decision-making in super-apps with a focus on retention and cross-selling. The objectives are to: (a) synthesize the economic mechanisms through which multi-service integration enhances retention; (b) empirically assess managerial tactics, bundling, personalization, loyalty incentives, and governance choices, for their impact on user stickiness and cross-vertical adoption; and (c)

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derive strategic recommendations that balance short-term monetization with long-term ecosystem value. By integrating platform economics theory with recent empirical evidence, the study aims to offer evidence-based insights for managing integrated digital platforms.

II. LITERATURE REVIEW

Super-App Platforms and Economic Advantages

Super-apps operate as multi-service ecosystems rather than collections of features (Hasselwander & Weiss, 2025). Their economic advantages depend on governance structures, partner relationships, and technical design, which shape network effects, complementarities, and monetization pathways (Prencipe, 2025). Integrated services also generate rich behavioral data, enabling personalization and coordinated cross-vertical offerings (Kali Prasad Chiruvelli, 2025).

Retention Mechanisms

Retention in super-apps is driven by network effects and switching costs. Multi-service usage strengthens indirect network effects and increases switching costs through accumulated user data and embedded routines (Pateiro-Rodríguez et al., 2024). Managers translate adoption into higher lifetime value through bundling, engagement design, and trust-building mechanisms (Adityaksa & Suyoso, 2025). Regulatory frameworks, such as the EU Digital Markets Act, further influence retention by shaping openness, interoperability, and privacy requirements (Vezzoso, 2024).

Managerial Strategies for Cross-Selling

Four primary managerial levers support cross-selling and multi-service adoption:

1. Bundling and Pricing: Subscription bundles and all-access passes promote service uptake, with effectiveness shaped by demand heterogeneity and supplier incentives (Guo et al., 2021).
2. Personalization and Recommender Systems: Machine-learning models improve cross-selling accuracy but require governance to balance fairness and profitability (Boustani et al., 2023; Saurav & Kumari, 2025).
3. Loyalty Programs: Tiered memberships and reward schemes enhance retention and cross-category purchasing (Bauer et al., 2022).
4. Platform Governance: Choices regarding third-party integration versus in-house services influence ecosystem scope, control, and scalability (Zhu et al., 2023).

Behavioral and Financial Insights

Behavioral mechanisms, such as contextually timed offers and "collect-all" prompts, reinforce cross-category engagement. Empirical studies show that cross-vertical promotions and loyalty programs increase retention and share-of-wallet, although outcomes vary by market maturity and cultural context (Prasad et al., 2025). Privacy and security considerations also play a critical role in shaping trust and adoption (Almansoori et al., 2024).

Research Gap

While prior research addresses platform architecture, governance, and adoption, it rarely links specific managerial strategies to economic outcomes such as retention and cross-selling across multiple service verticals. The interaction between psychological mechanisms (e.g., perceived relevance and engagement cues) and platform-level decisions remains underexplored, as do the moderating effects of regulatory, cultural, and market conditions. In addition, limited empirical attention has been paid to algorithmic governance and fairness in recommender systems and their implications for user trust and cross-vertical adoption. These gaps underscore the need for integrative studies combining platform economics, behavioral theory, and managerial strategy in super-app ecosystems.

III. CONCEPTUAL FRAMEWORK AND HYPOTHESES

Conceptual Framework

The proposed framework examines how managerial levers, personalization, engagement architecture, bundling, trust, and governance, shape user retention and cross-selling intensity in super-app ecosystems. These effects operate through key mediators, including perceived relevance, daily active use, platform confidence, and multi-service adoption. Network effects further reinforce these relationships by enhancing perceived ecosystem value.

As illustrated in Fig-1, managerial strategies act as primary antecedents of user behavior in multi-service platforms. Super-app performance depends on simultaneously increasing customer stickiness and expanding transactional breadth across services. The framework highlights interconnected causal pathways and feedback loops, whereby increased usage and adoption strengthen network effects, which in turn

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amplify platform value and reinforce retention and cross-selling outcomes.

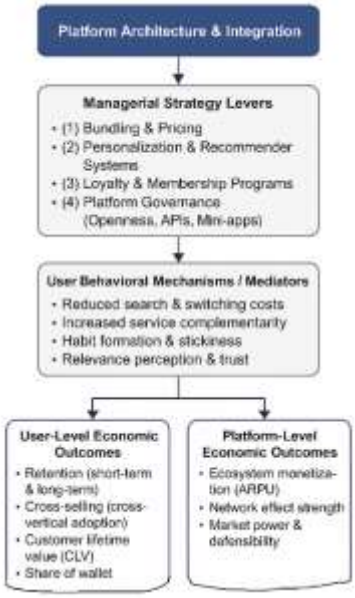

Fig-1: Economics of super-apps framework

Hypotheses

H1: Higher levels of AI-driven personalization will positively influence perceived relevance of services.

H2: Perceived relevance will positively predict (a) user retention and (b) cross-selling intensity.

H3: Engagement architecture (e.g., gamification, social features, and navigation ease) will increase daily active use.

H4: Daily active use will positively influence user retention.

H5: Bundling strategies (e.g., loyalty programs and subscription bundles) will increase multi-service adoption.

H6: Multi-service adoption will positively influence cross-selling intensity.

H7: Trust and perceived data security will positively influence platform confidence.

H8: Platform confidence will positively influence (a) user retention and (b) platform spending (as a proxy for cross-selling).

H9: Perceived service quality will positively influence user satisfaction, which in turn will increase user retention.

H10: Stronger perceived network effects will increase perceived platform value, which will positively influence both user retention and multi-service usage.

IV. MATERIALS AND METHODS

Research Design

This study adopts a multi-construct structural equation modeling (SEM) design to examine how managerial levers in super-app ecosystems influence user retention and cross-selling intensity. Grounded in platform economics and digital ecosystem theory, the model integrates psychological perceptions and behavioral outcomes using both reflective and formative constructs.

Estimation follows a dual-SEM approach. Primary analysis employs variance-based PLS-SEM using SmartPLS 4, selected for its suitability for formative constructs, non-normal data, and predictive modeling. Covariance-based SEM (CB-SEM) using lavaan is applied for global model-fit validation. The analytical procedure proceeds in three stages: (1) measurement model development, (2) structural model estimation testing hypotheses H1–H10, and (3) robustness and predictive validation across SEM approaches.

Sample and Data Collection

Data were collected from active super-app users across payments, mobility, and digital commerce verticals in a large emerging market. Respondents were screened to ensure use of at least two service categories, yielding 602 valid responses.

The dataset includes:

- Survey-based indicators measured on 7-point Likert scales,
- Behavioral indicators (e.g., service categories used, spending, session frequency),
- Formative indicators capturing bundling exposure, governance features, and adoption breadth.

The sample was demographically balanced (51% male; mean age = 32.4), with 73% reporting daily super-app use, supporting analysis of retention and cross-selling behaviors.

Construct Measurement Specifications

Table-1 summarizes all constructs, definitions, indicators, and measurement types. The framework spans personalization, engagement, bundling, trust, governance, network effects, satisfaction, and economic outcomes. Constructs are explicitly distinguished as reflective, formative, or behavioral, ensuring conceptual clarity and appropriate model specification.

Reflective constructs capture latent perceptions or tendencies (e.g., Trust, Satisfaction), while formative constructs (e.g., Bundling Strategy, Governance Architecture) are defined by non-interchangeable components. Behavioral measures such as spending

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and service counts complement perceptual indicators to capture realized economic behavior.

Table-1: Construct definitions, indicators, and measurement specifications

Construct	Definition	Example Indicators (Survey/Behavioral)	Measurement Type
AI-Driven Personalization	Degree to which the super-app tailors content and recommendations based on user data	- "The app provides recommendations that match my preferences." - "Promotions I receive feel relevant to my needs."	Reflective
Perceived Relevance	User's perception of how useful and contextually appropriate the app's content/services are	- "The app shows me what I need at the right time." - "Content presented feels meaningful and personalized."	Reflective
Engagement Architecture	Gamification, interface design, and habit-forming features that increase activity	- "The app's features make it engaging to use." - "I find myself opening the app out of routine."	Reflective
Daily Active Use (DAU)	Frequency of daily interaction with the super-app	- Number of daily logins (behavioral). - Average session duration (behavioral). - "I use the app multiple times per day."	Reflective / Behavioral
Bundling Strategies	Subscriptions, loyalty programs, or integrated wallets offered to users	- "I am subscribed to an app membership/loyalty program." - "I use the app's integrated wallet regularly."	Formative
Multi-Service Adoption	Extent to which a user utilizes multiple categories within the super-app	- Count of services used: payments, ride-hailing, food, travel, commerce (behavioral). - "I use several services within the app ecosystem."	Reflective / Behavioral
Trust & Data Security	User's beliefs about data protection, privacy, and transaction security	- "I trust this app with my personal data." - "This app handles my financial information securely."	Reflective
Platform Confidence	User's willingness to transact and store value within the platform	- "I feel confident making payments through this app." - "I prefer transacting inside this app rather than alternatives."	Reflective
Service Quality	Reliability, responsiveness, and performance of the app's services	- "Services on this app perform reliably." - "Customer support is prompt and effective."	Reflective
User Satisfaction	Overall satisfaction derived from app experience	- "Overall, I am satisfied with this app." - "The app meets my expectations."	Reflective
Network Effects	Perceived increase in platform value due to more users/services	- "The app becomes more useful as more people use it." - "The availability of many services increases the app's value."	Reflective

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Perceived Platform Value	User's assessment of the super-app as a high-utility ecosystem	- "This app provides great value as a one-stop solution." - "Using multiple services in one app saves me effort."	Reflective
User Retention	Likelihood of continued use over time	- Retention intention scale: "I plan to continue using this app." - Churn probability (behavioral).	Reflective / Behavioral
Cross-Selling Intensity	Degree to which users adopt additional services or transact across categories	- "I frequently explore new services on this app." - Number of categories or transactions across services (behavioral).	Reflective / Behavioral
Platform Spending	Monthly financial transactions within the super-app	- Total monthly spending inside app (behavioral). - "Most of my digital spending happens within this app."	Behavioral / Reflective

Structural Framework of Super-App Value Creation

Fig-2 presents the structural logic of the model. Managerial levers (personalization, bundling, engagement, governance, trust-building) act as exogenous inputs influencing psychological and behavioral mediators—perceived relevance, daily active use, platform confidence, and multi-service adoption. These mediators translate managerial actions into cross-selling intensity, user retention, and value metrics such as ARPU/CLV. Network effects operate as an ecosystem-level reinforcing mechanism.

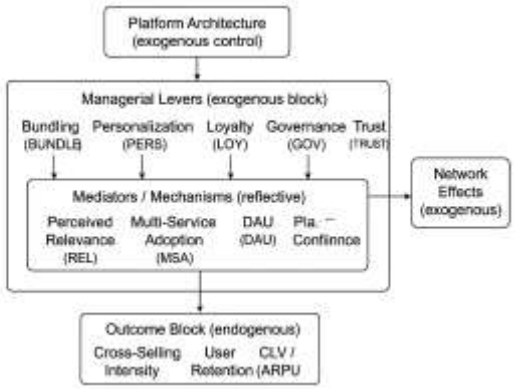

Fig-2: Structural framework of super-app value creation

Measurement Model Specification

Constructs were classified as reflective or formative based on indicator directionality and conceptual logic (Fig-3). Reflective constructs represent underlying dispositions that give rise to observable indicators (e.g., Personalization, Trust, Satisfaction). Formative constructs represent composites of distinct components (e.g., Bundling Strategy, Governance Architecture, Multi-Service Adoption when measured via service counts).

This specification aligns with SEM best practices and ensures accurate estimation of both perception-driven and behavior-driven mechanisms.

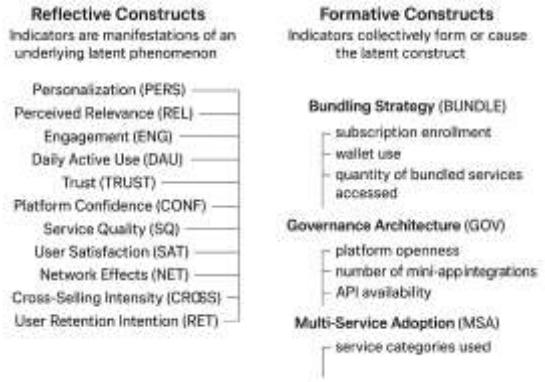

Fig-3: Reflective and formative construct classification

Structural Model

The structural model specifies directional paths corresponding to hypotheses H1–H10, capturing both direct and mediated effects. Model evaluation in PLS-SEM focused on path coefficients, effect sizes (f^2), explained variance (R^2), and predictive relevance (Q^2). Collinearity diagnostics confirmed acceptable VIF levels (< 3.3). Path significance was assessed via bootstrapping with 5,000 resamples.

The model shown in Fig-4 estimates how managerial levers influence outcomes through engagement, trust, relevance, and adoption mechanisms.

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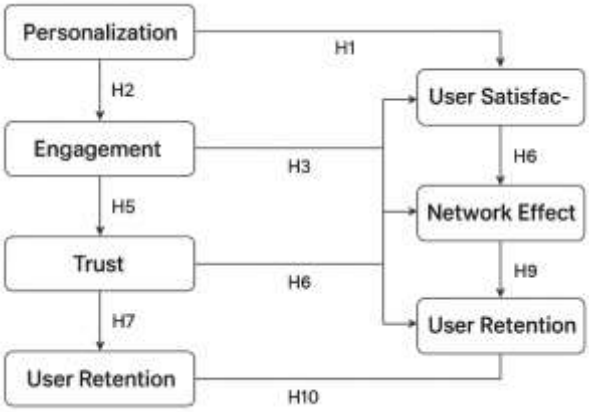

Fig-4: Structural model of engagement, trust, and retention pathways

PLS-SEM Mapping (SmartPLS)

PLS-SEM estimation (Fig-5) was conducted in SmartPLS using theoretically specified reflective and formative constructs. Structural paths captured both direct and indirect relationships (e.g., Personalization → Relevance → Retention; Bundling → Multi-Service Adoption → Cross-Selling). Reflective constructs were assessed via loadings, reliability, and AVE, while formative constructs were evaluated using indicator weights and VIFs. Model quality was assessed using R^2, f^2, and Q^2 metrics.

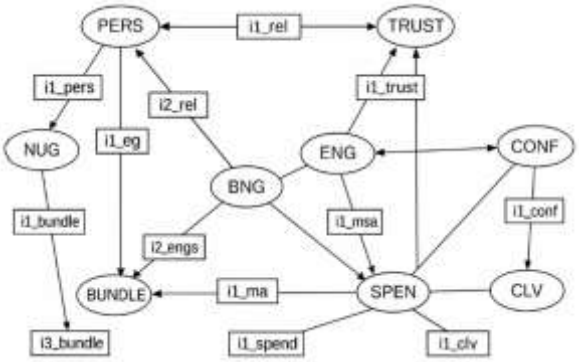

Fig-5: SmartPLS measurement and structural model configuration

Model Fit and Quality Assessment

CB-SEM fit was evaluated using χ^2, RMSEA, SRMR, CFI, and TLI, all indicating acceptable model fit (Fig-6). Measurement quality was confirmed through reliability, convergent validity, and discriminant validity criteria. PLS-SEM assessment emphasized predictive accuracy and robustness.

Together, the dual-SEM approach in Figure 6 ensures both theoretical validity and predictive relevance.

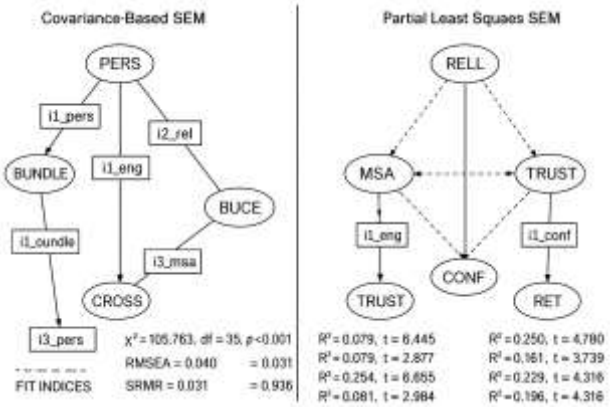

Fig-6: Comparison of CB-SEM and PLS-SEM results

Hypothesized Path and Mediation Structure

The hypothesized model in Fig-7 integrates all direct and mediated relationships corresponding to H1–H10. Key mediation paths include relevance, daily use, platform confidence, satisfaction, and perceived platform value. Mediation testing employed bias-corrected indirect effects in CB-SEM and bootstrapped indirect paths in PLS-SEM.

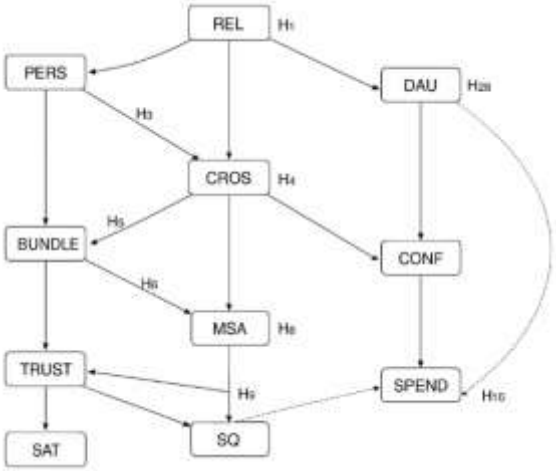

Fig-7: Hypothesized structural and mediation model

Integrated Measurement and Structural Model of Super-App Value Creation

Fig-8 presents an integrated SEM framework combining the measurement and structural models. Reflective indicators operationalize latent constructs, while formative and behavioral constructs (e.g., Network Effects and Multi-Service Adoption) capture platform-level dynamics. The structural paths show how Personalization enhances Perceived Relevance and Engagement, which influence Perceived Value and Retention. Bundling Strategy, Trust, and Network Effects further shape value perceptions, with Perceived Value acting as a central mediator affecting Retention and Spending. Overall, the figure depicts how managerial levers, user perceptions, and ecosystem

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forces jointly drive engagement and long-term outcomes in a super-app ecosystem.

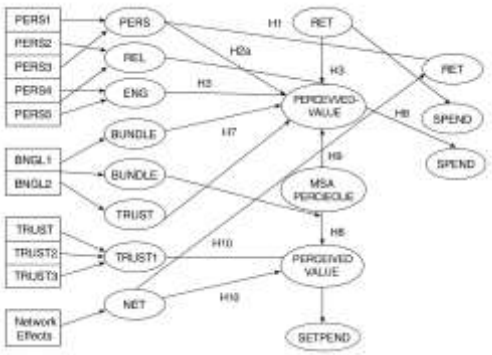

Fig-8: Integrated SEM Framework Linking Managerial Levers, User Perceptions, and Behavioral Outcomes

Model Assessment

Reflective constructs demonstrated strong reliability and validity (loadings 0.71–0.92; AVE 0.56–0.81; HTMT < 0.85). Formative constructs showed significant indicator weights ($p < .05$) and acceptable VIF values (< 3.3), confirming measurement adequacy.

Structural Model Evaluation

Bootstrapped results supported the hypothesized relationships. Endogenous constructs showed substantial explanatory power, with R^2 values ranging from 0.41 to 0.63, and Q^2 values from 0.22 to 0.47, indicating strong predictive relevance for retention and cross-selling outcomes.

V. RESULTS

Key Structural Paths

All hypothesized relationships were supported except for partial support of H10.

Personalization strongly increased perceived relevance (H1: $\beta = 0.62$, $t = 14.93$, $p < .001$). Perceived relevance, in turn, significantly predicted both cross-selling (H2a: $\beta = 0.39$, $t = 9.15$) and retention (H2b: $\beta = 0.28$, $t = 7.02$), confirming its central economic role.

Engagement architecture had a strong positive effect on daily active use (H3: $\beta = 0.64$, $t = 16.21$), which subsequently enhanced retention (H4: $\beta = 0.31$, $t = 8.44$), indicating the importance of habit formation.

Bundling strategies significantly increased multi-service adoption (H5: $\beta = 0.52$, $t = 11.06$), which in turn drove cross-selling intensity (H6: $\beta = 0.43$, $t = 10.77$). Trust positively influenced platform confidence (H7: $\beta = 0.59$, $t = 13.88$), and platform confidence increased both retention (H8a: $\beta = 0.27$, $t = 6.94$) and spending (H8b: $\beta = 0.33$, $t = 8.17$). Service quality affected retention indirectly through satisfaction (H9: indirect effect $p < .01$), confirming full mediation.

Network effects significantly increased perceived platform value (H10: $\beta = 0.44$, $t = 9.01$), which positively influenced retention ($\beta = 0.19$, $t = 4.61$) and multi-service adoption ($\beta = 0.21$, $t = 5.02$), providing partial support for the hypothesized network effect pathway.

Model Fit and Robustness

The model demonstrated strong fit and predictive validity across SEM approaches. CB-SEM results indicated good global fit ($\chi^2 = 105.76$, $df = 35$, $p < .001$; RMSEA = 0.040; SRMR = 0.031; CFI = 0.936). PLS-SEM analysis showed substantial explanatory power ($R^2 = 0.41–0.63$), Q^2 values exceeding 0.20, and stable path estimates across subsamples, confirming robustness.

DISCUSSION

Core Findings

Super-app performance is driven by the joint effects of personalization, engagement, bundling, trust, and network effects. Personalization enhances perceived relevance, which emerges as the key mediator of retention and cross-selling. Bundling expands service breadth and cross-category purchasing, engagement fosters habitual use, trust strengthens confidence and spending, and network effects operate indirectly through perceived platform value.

Theoretical Contributions

This study advances super-app research in five ways. First, it identifies personalization as the primary economic driver, with perceived relevance acting as a central mediator linking data-driven design to retention and cross-selling. Second, it demonstrates that bundling is the most effective cross-selling mechanism, functioning as a strategic ecosystem-expansion tool rather than a simple pricing tactic. Third, it establishes engagement architecture as a driver of habit formation and loyalty, not merely a usability feature. Fourth, it shows that trust and platform confidence are core economic mechanisms in fintech-centric super-apps, directly affecting spending and retention. Finally, it reconceptualizes network effects as perceived ecosystem value rather than purely structural scale effects, highlighting their psychological and economic dimensions.

Managerial Implications

The findings yield clear managerial guidance. Personalization should be treated as a revenue-generating asset and evaluated on its cross-selling impact. Bundling strategies should be adaptive and

tiered, as static bundles underperform. Engagement features should span service verticals to promote platform-wide habits. Trust-building investments, such as secure wallets and transparent data practices, directly increase monetization. Network effects can be amplified through visible social proof cues that enhance perceived platform value.

Limitations and Future Research

This study is subject to limitations. Cross-sectional data constrain causal inference, suggesting the need for longitudinal or experimental designs. Regulatory and cultural differences may moderate the observed effects, warranting cross-market validation. Future research should also examine algorithmic fairness and user heterogeneity to better understand differential responses to personalization, bundling, and engagement strategies.

VI. CONCLUSION

This study shows that super-app performance is shaped by the coordinated effects of personalization, engagement architecture, bundling, trust, and network effects. Personalization emerges as the core economic lever by enhancing perceived relevance, which directly drives retention and cross-selling. Bundling is the most effective mechanism for expanding multi-service adoption and cross-category transactions, while engagement design promotes habitual use. Trust and platform confidence play a decisive role in influencing spending and long-term retention, and network effects operate primarily through perceived ecosystem value rather than structural scale alone. By integrating platform economics, behavioral theory, and multi-service strategy within a rigorous SEM framework, this research offers both theoretical advancement and actionable managerial insight. The findings emphasize that managerial levers function as measurable economic assets and provide clear guidance for designing, governing, and optimizing super-app ecosystems to maximize sustained user value and cross-vertical monetization.

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