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Analyzing Factors Influencing the Adoption of Mobile Banking Services at Natsave Bank in Lufwanyama District of Zambia

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Abstract:

This study investigates the factors that influence mobile banking adoption at NATSAVE Bank in Lufwanyama District, Zambia which is a rural area with only 38% internet penetration and low digital literacy. Using a mixed-methods design, the study applied logistic regression and thematic analysis to data from 117 participants. Findings reveal that although 90% of customers are registered for mobile banking, only 30% actively use the platform, signaling a significant adoption gap. Adoption was significantly influenced by trust (Odds Ratio = 4.26), cost perception (Odds Ratio = 3.32), and network reliability (Odds Ratio = 1.82). The study builds on the Technology Acceptance Model (TAM) and Unified Theory of Acceptance and Use of Technology (UTAUT), linking empirical findings to key theoretical constructs like perceived usefulness, ease of use, and social influence. It fills a gap in literature that often neglects rural-specific adoption barriers such as cultural resistance, infrastructural limitations, and competitive pressure from MNOs like Airtel and MTN, which dominate over 70% of Zambia's mobile money market. Novel to this study is its contextual focus on rural micro-entrepreneurs and low-income customers, paired with a robust blend of statistical and qualitative insights. By proposing actionable strategies like expanding agent networks, introducing tiered pricing, and enhancing digital literacy, this research contributes both theoretically and practically to Zambia's financial inclusion agenda. The implications extend to policy, banking strategy, and future research on technology adoption in low-resource environments.

Keywords: Mobile Banking, Financial Inclusion, Trust, Cost perception, network reliability, Adoption, UTAUT, TAM

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1. Introduction

Despite the proliferation of mobile technologies across Sub-Saharan Africa, a considerable segment of the population, particularly in rural regions, remains excluded from formal financial services. In Zambia, where over 60% of the population is employed in the informal sector and nearly 87.5% of the workforce operates outside the formal economy (CSO, 2020), access to affordable and secure banking remains elusive. The advent of mobile banking offers a potentially transformative solution to this challenge, particularly in remote areas with limited physical banking infrastructure. However, the uptake of such technologies remains uneven, raising important questions about the barriers that impede their adoption and the strategies that might enhance their usage.

This research was initiated to address a persistent and context-specific problem, which is the gap between mobile banking enrollment and actual usage among rural clients of NATSAVE Bank in Zambia's rural district. Despite technological rollout and policy support, usage statistics remained discouragingly low with only 30% of mobile banking enrollees actively used the service (Mwila & Kunda, 2022). These findings prompted a deeper inquiry into the behavioral, infrastructural, and institutional dynamics at play in mobile banking adoption in rural Zambia.

The purpose of this study was to investigate the key factors influencing mobile banking adoption at NATSAVE Bank, with a focus on the specific needs and behaviors of rural clients in Lufwanyama District. The central hypothesis proposed that trust, financial literacy, and mobile network reliability significantly affect mobile banking adoption. Furthermore, we hypothesized that strategies tailored to these variables could meaningfully improve uptake.

This study sought to answer three core questions:

1. What factors influence mobile banking adoption over traditional methods in Lufwanyama?
2. How do trust, literacy, and network quality interact to shape mobile banking behavior?
3. What practical strategies can improve adoption among NATSAVE's rural clients?

This inquiry emerges from a recognized knowledge gap in the literature. While mobile banking has been studied extensively in urban and peri-urban contexts (Ayo et al., 2016; Ha et al., 2012), rural adoption dynamics—especially among the unbanked and underbanked in Zambia—remain underexplored. Prior studies have failed to examine how cultural norms, digital infrastructure constraints, and perceived financial risks interact in shaping user behavior within localized settings like Lufwanyama.

The rationale behind the study lies in the potential impact that improved mobile banking services could have on financial inclusion and economic empowerment. Given NATSAVE's mandate to serve marginalized communities, enhancing mobile banking effectiveness directly aligns with Zambia's National Financial Inclusion Strategy (2017–2022), which prioritizes access to affordable financial tools (World Bank, 2020).

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In summary, this research aimed to produce actionable insights for NATSAVE and similar institutions by identifying context-specific factors influencing adoption, assessing user perceptions, and proposing strategies to bridge the gap between enrollment and meaningful use. Ultimately, it contributes to the broader discourse on digital financial inclusion in low-income, rural economies.

2. Literature Review

2.1 Literature Overview

The adoption of mobile banking in rural contexts has attracted increasing scholarly attention, especially for its role in promoting financial inclusion. In Zambia, multiple studies have explored the determinants of mobile money usage. Kawimbe (2022) identified cost and network quality as major barriers, finding that although over 80% of users were registered, only 32% actively used mobile services. Similarly, Mwila and Kunda (2022) revealed that Mobile Network Operators (MNOs) dominate 70% of mobile money transactions, largely due to perceived affordability and usability. However, both studies failed to explore trust, digital literacy, and infrastructure constraints specific to rural bank customers.

Koi-Akrofi (2022) extended these insights across Africa, highlighting limited agent networks and low ease-of-use perceptions as barriers to rural adoption. Ahmad, Green, and Jiang (2020) emphasized the role of agent accessibility in facilitating adoption, although their focus remained on generalized African experiences. Museba et al. (2021) showed that peer influence and proximity to agents significantly drive digital finance adoption in Uganda. Still, contextual differences like Zambia's unique infrastructural and socio-cultural landscape were not considered.

This study contributes to the literature by bridging these gaps through offering a localized analysis of rural adoption dynamics at NATSAVE Bank in Lufwanyama District. Guided by the Technology Acceptance Model (TAM) and Unified Theory of Acceptance and Use of Technology (UTAUT), the study examines how trust, perceived ease of use, and infrastructural limitations impact adoption. Unlike prior research, this study applies a mixed-methods design to explore not only statistical trends but also the varying behavioral and cultural factors influencing mobile banking behavior.

2.2 Conceptual Framework

- Independent Variables (IVs): Trust, perceived ease of use, financial literacy, and network reliability.
- Dependent Variable (DV): Adoption of mobile banking services. This study hypothesizes that these IVs significantly influence the DV, which will be tested through statistical analysis.

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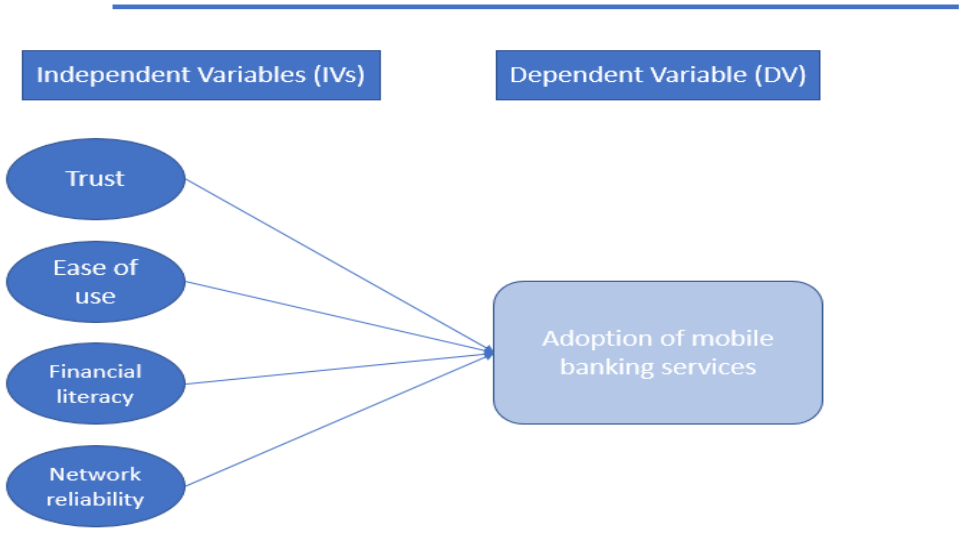

Figure 1: Proposed Conceptual Framework: Relationship between independent and dependent variables

3. Research Methodology

This study was conducted in Lufwanyama District, a rural area in Zambia's Copperbelt Province characterized by limited access to banking infrastructure and low digital penetration. The study aimed to assess the factors influencing the adoption of mobile banking services among NATSAVE Bank customers.

3.1 Research design

A sequential explanatory mixed-methods design was employed, beginning with qualitative semi-structured interviews followed by quantitative surveys. This approach fits the study as it allows the identification of statistical trends while simultaneously providing specific, contextual explanations for those trends (Creswell & Plano Clark, 2017).

3.2 Sampling Technique

A stratified random sampling strategy was used to ensure representation across key demographics like age, income level, geographic location, and mobile banking usage patterns. From NATSAVE's customer base in Lufwanyama, 117 participants were surveyed, and 20 interviewees were selected for qualitative insights. Stratification helped address variability in access and behavior, while random selection minimized bias.

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3.3 Data Analysis

Quantitative data was analyzed using descriptive statistics and logistic regression, assessing relationships between mobile banking adoption and factors like trust, cost, ease of use, and accessibility. Qualitative data was coded and analyzed thematically to identify patterns in user experiences.

The logistic regression equation is specified as:

$$\text{Logit}(P) = \beta 0 + \beta 1(\text{Demographic Characteristics}) + \beta 2(\text{Income}) + \beta 3(\text{Economic Factors}) + \beta 4(\text{Trust and Security}) + \beta 5(\text{Geographic Location})$$

Where:

- P: Probability of adopting mobile banking.
- $\beta 0$: Intercept.
- $\beta 1, \beta 2, \cdots, \beta 5$: Coefficients for each independent variable.

4. Results and Discussion

4.1 Results

4.1.1 Quantitative Findings

From the sample of 117 participants, 64.1% had adopted mobile banking, indicating a moderate uptake level. Key demographic insights showed that the majority of adopters fell within the 18–30 and 31–45 age groups, suggesting a younger demographics' openness to digital financial services. Higher adoption was also observed among males and individuals with tertiary education.

Summary Statistics for Key Variables

Table 1: Summary Statistics

Variable	*Mean*	*Standard Deviation*
Age (years)	38.5	12.4
Monthly Income (ZMW)	4,200	1,200
Trust in NATSAVE (Likert)	4.2	0.9
Accessibility Score	3.8	1.1

Mobile Banking Adoption Status

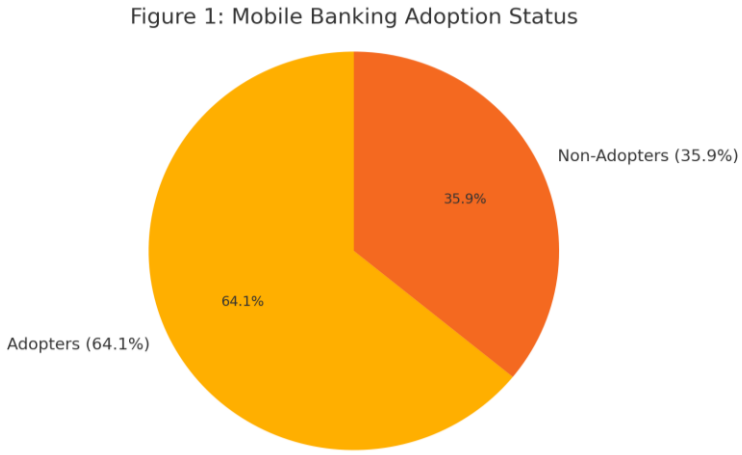

Figure 1: Mobile Banking Adoption Status

A logistic regression model confirmed several statistically significant predictors of mobile banking adoption:

- Trust in NATSAVE (Odds Ratio = 4.26, $p < 0.002$)
- Perceived Security (Odds Ratio = 3.01, $p < 0.001$)
- Cost Perception (Cheap: Odds Ratio = 3.32, $p < 0.001$)
- Education Level (Odds Ratio = 2.03, $p < 0.001$)
- Income above 6,000 ZMW (Odds Ratio = 2.34, $p < 0.001$)
- Urban Location (Odds Ratio = 1.82, $p = 0.005$)

Table 2: Logistic Regression Summary

Predictor	Odds Ratio	Effect
Trust in NATSAVE	4.26	Strong positive predictor
Perceived Security	3.01	Positive predictor
Cost Perception (cheap)	3.32	Strong positive
Urban Location	1.82	Positive (urban bias)
Education Level	2.03	Positive predictor

Chi-square tests also validated that adoption was significantly associated with trust ($p = 0.002$), accessibility score ($p = 0.001$), and cost perception ($p = 0.002$).

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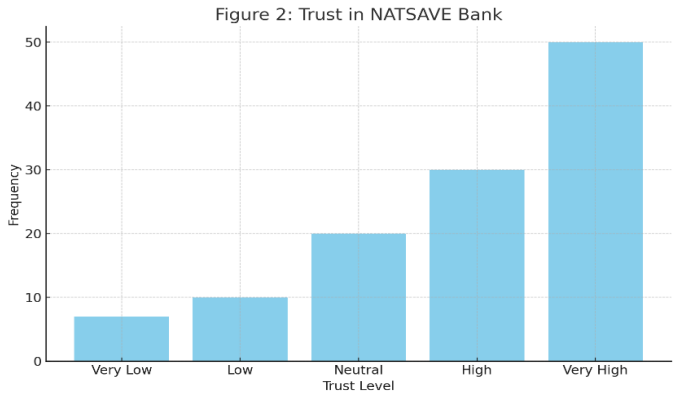

Figure 2: Trust in NATSAVE Bank

4.1.2 Qualitative Findings (Themes)

Through 20 in-depth interviews, five core themes emerged:

1. Trust and Security: 32 mentions – concerns about fraud and data privacy were widespread.
2. Cost Perception: 27 mentions – while some found mobile banking cheaper, many low-income users found fees prohibitive.
3. Access Challenges: 25 mentions – poor network coverage and agent unavailability hindered usage.
4. Technology Literacy: 18 mentions – lack of digital skills among older and less-educated users.
5. Convenience: 22 mentions – users appreciated the ability to transact without visiting a bank branch.

A thematic map was developed to visualize the interconnection between these factors.

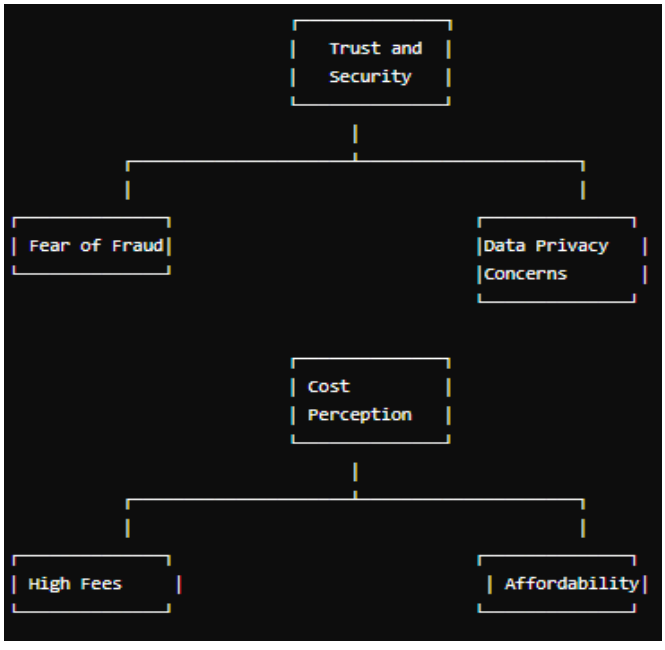

Figure 3: Thematic map

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4.2 Discussion

Interpreting the Results

The findings clearly support the hypothesis that trust, perceived cost, mobile literacy, and infrastructure play critical roles in mobile banking adoption. High trust in NATSAVE significantly boosted adoption likelihood, aligning with Kawimbe (2022), who emphasized trust as a cornerstone of digital financial service uptake.

Cost perception also significantly influenced behavior. Those who found mobile banking "cheap" were over three times more likely to adopt it. This mirrors Jack and Suri's (2014) findings that affordability is essential for financial inclusion. However, the Lufwanyama context adds a variance: low-income users perceived costs as high due to low transaction volumes, suggesting a mismatch between pricing models and local economic conditions.

Accessibility, particularly network reliability and agent availability, was another major barrier. Urban customers were nearly twice as likely to adopt mobile banking compared to rural ones. This result echoes Mwila and Kunda (2022), yet this study adds a localized depth, showing that even within Lufwanyama, peri-urban zones fare better than remote rural areas.

Technology literacy emerged as a hidden barrier. While not often visible in national studies, this study revealed how usability and interface design affect adoption in rural contexts. Older and less-educated respondents frequently cited difficulty using apps, reinforcing the need for simplified user interfaces and educational campaigns.

Relation to Research Objectives

Objective 1: Key Adoption Factors

Findings identified trust, cost, education, and accessibility as key predictors—fully addressing the first objective.

Objective 2: Impact of Trust, Literacy, and Network

Statistical analysis confirmed that trust and network reliability significantly influence adoption. Qualitative data enriched this by showing how these variables manifest in users' lived experiences.

Objective 3: Strategies to Enhance Adoption

The results suggest that adoption can be increased through:

- Reduced transaction fees
- Stronger fraud protection messaging
- Agent network expansion
- Mobile banking tutorials in local languages

The results are consistent with regional and global literature but add contextual nuance. Unlike previous national-level studies (Kawimbe, 2022; Mwila & Kunda, 2022), this research isolates rural-

specific barriers, revealing how cultural norms, local agent reliance, and perceived fraud risk shape adoption in Lufwanyama.

5. Conclusions and Recommendations

This study reveals that 64.1% of NATSAVE customers in Lufwanyama have adopted mobile banking, with adoption strongly influenced by trust (OR = 4.26), cost perception (OR = 3.32), and network reliability (OR = 1.82). These findings underscore the importance of building trust, simplifying service interfaces, and expanding infrastructure in rural areas (Kawimbe, 2022; Venkatesh et al., 2003). NATSAVE should focus on digital literacy training, agent network expansion, and revised pricing models to improve affordability and usability. Policy support is also crucial to enhance mobile coverage in underserved regions. Future research should explore longitudinal adoption behavior, include comparative analyses across rural districts, and evaluate the role of fintech partnerships in deepening financial inclusion. These steps are essential for aligning mobile banking with Zambia's broader financial inclusion goals (World Bank, 2020).

Declarations

Conflict of Interest: The authors declare that there is no conflict of interest.

Funding: This study was self-funded by the primary researcher as part of the graduate research program at the University of Zambia.

Ethical considerations: Ethical approval was obtained in accordance with the Zambia Data Protection Act (2021), and all participants provided informed consent. Identities were anonymized, and data was securely stored to ensure confidentiality and compliance with institutional and national ethical standards.

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