

## Towards Sustainable Payment Banking: A Pilot Study on Digital Usability, Operational Reliability, and Financial Inclusion Outcomes

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### ABSTRACT

Sustainable digital payment systems are essential for strengthening India's financial ecosystem, particularly for low-income and underserved populations. Payment banks, designed to encourage financial inclusion, depend heavily on digital usability, operational reliability, and user satisfaction for their long-term sustainability. This pilot study explores how key dimensions of digital payment banking usability, accessibility, affordability, trust, system reliability, and service support shape financial inclusion outcomes. Using a structured questionnaire administered to 48 respondents, the study employs simple descriptive statistics, reliability checks, and correlation analysis to evaluate user experiences and perceived service sustainability. Findings indicate that easy-to-use digital interfaces, affordable services, predictable fees, and reliable transaction performance strongly influence user satisfaction and their continued use of payment bank services. Operational reliability emerged as a central predictor of sustained engagement, suggesting that system stability and timely customer support are critical for service sustainability. While limited by its small sample size, this pilot study provides early evidence on the factors influencing sustainable digital payment banking in India and offers directions for scaling up research, improving service delivery, and strengthening policy interventions to advance long-term financial inclusion.

**Keywords:** Financial Inclusion, Usability, Accessibility, Affordability, Operational Sustainability.

### Introduction

Financial system in India has undergone transformation over the last decade, driven largely by rapid digitalisation, policy reforms and the expansion of technology-enabled payment infrastructures. As a result of this Reserve Bank of India issued **Financial Inclusion Index (FI-Index)** for year ending **March 2025 that stands at 67%** compared to 64.2% in March 2024. Despite notable progress large segments of population in India including low-income households, informal workers, migrants continue to face barriers to sustained financial inclusion. Not only is access sufficient, but the long-term effectiveness of financial inclusion initiatives increasingly depends on usability, affordability, reliability, and sustainability of online financial services.

In this context, payment banks have strategic position. Payment banks have appeared as significant milestone in enhancing banking penetration in India. By leveraging technology, simplifying processes, and focusing on basic banking services, they have played a pivotal role in bringing banking services to the unbanked and underserved sections of society, contributing to the country's financial inclusion agenda. (Paramasivan & Ravichandiran, 2024) Unlike traditional banks, payment banks depend almost entirely on digital platforms, making their sustainability intrinsically linked to digital usability and operational efficiency.

Digital usability comprising accessibility, ease of use, affordability, and convenience plays a key role in determining whether payment banking services translate into meaningful financial inclusion. Existing studies suggest that user-friendly interfaces, predictable transaction costs, and simple onboarding processes significantly influence adoption and frequency of use among first-time and low-literacy users (Mittal et al., 2017). For underserved populations, even minor usability barriers can discourage continued engagement, thereby limiting the inclusionary impact of digital finance.

Equally important is operational reliability, which encompasses system stability, transaction success rates, service speed, and customer support mechanisms. Trust in digital payment systems is built through consistent transaction performance and timely grievance redressal. Empirical evidence indicates that transaction failures, service downtime, and weak customer support negatively affect user satisfaction and long-term usage intention, particularly in payment-bank-led ecosystems where physical branch support is minimal (Sikdar & Kumar, 2016; Iyer et al., 2017). As payment banks operate on thin margins and high transaction volumes, operational disruptions can directly threaten both user confidence and institutional sustainability.

While existing literature has focused on payment banks from regulatory, conceptual, and macro-policy perspectives, empirical studies integrating digital usability, operational sustainability, and financial inclusion outcomes at the user level remain limited. Most prior research focuses on awareness, perception, or comparative analysis with traditional banks, with relatively less emphasis on how user experience dimensions influence satisfaction and continued usage key indicators of sustainable financial inclusion (Darbar, 2025). Moreover, micro-level evidence from semi-urban and rural regions, where digital infrastructure and literacy vary significantly, is still scarce.

This pilot study aims to fill the research gap by empirically investigating how digital usability and operational sustainability factors affect financial inclusion outcomes, user satisfaction, and the intention for continued use. Drawing on primary data from payment bank users in the Dharwad and Gadag districts of Karnataka, the study offers early empirical insights into the determinants of sustainable payment banking and contributes to the broader discussion on technology-driven financial inclusion in India.

#### Review of Literature

(Paramasivan & Ravichandiran, 2024) The author of this report intended to focus on payment banks' financial performance.

(Mittal et al., 2017) The study analyses the preference of customers in using the services of payment banks over the services provided by universal banks. The services provided by payment banks are different than the products and services of universal banks and there has been constant and continuous increase in the customer base of payment banks. Study emphasized examining causes of shifts and factors which affect consumers' decisions.

(Vimala, n.d.) Here researcher made an attempt for investigating and evaluating impact of Information Technology adoption on selected banks customers of Bank of India (BOI) in Bangalore Urban.

(Sharma et al., n.d.) Contribution of payment banks as a new banking model to the cashless economy is examined in this research article. Research on the cashless economy is crucial in developing or emerging nations since there are numerous obstacles to cashless economy. Primary idea behind research is lack of experimental evaluation regarding relationship between payment banks and cashless economy. 460 respondents from various areas and profiles, including those living in rural areas of country, working in unorganized sectors or living in remote areas, participated in this research study's survey. Results demonstrate that cashless economy is strongly correlated with payment bank factors such as banking model, technological awareness, customer security, cost of payment, infrastructure growth.

(Upadhyaya & Joshi, n.d.) To achieve stated objectives, author tries to investigate necessity of payment banks and evaluate development of their implementation and growth. Additionally, recommendations and policy implications are offered to improve their efficacy in fostering FI.

#### Objectives

- To evaluate how digital payment banking services (UPI, mobile apps, and wallets) influence financial inclusion among users by assessing their accessibility, usability, affordability, and overall convenience.

- To examine the impact of operational sustainability factors of payment banks (system reliability, transaction success, service speed, and customer support) on user satisfaction and continued usage intention.

### Research Methodology

Present research depends on primary as well as secondary data. Secondary data is collected from different websites such as from RBI and govt. Magazines, books, research papers were referred to get relevant information. Primary data is collected through a structured questionnaire based on five-point Likert scales. A convenience sampling was used due to the limited accessibility of payment bank users in the study area. The study collected responses from 50 respondents but after excluding incomplete Google Forms the researcher got 48 error-free responses from the targeted area Dharwad and Gadag district in Karnataka. The analysis of primary data was done with the help of suitable tables and graphs, diagrams and presented in the form of descriptive analysis.

### Data Analysis and Interpretation

- Reliability Analysis (Cronbach's Alpha):** Reliability was assessed for each construct of the questionnaire:

Construct	Items	Cronbach's alpha	Interpretation
Accessibility	3	0.76	Acceptable
Usability	4	0.82	Good
Affordability	3	0.70	Acceptable
Convenience	4	0.78	Acceptable
System Reliability	4	0.81	Good
Transaction success	3	0.79	Acceptable
Service speed	3	0.77	Acceptable
Customer support	3	0.73	Acceptable
User satisfaction	3	0.84	Good
Continued usage	3	0.80	Good

**Interpretation:** All constructs recorded more than 0.70, Confirming strong consistency. This means the items effectively measure digital usability and operational sustainability constructs.

### Variable structured for analysis

Construct	Variable Name	Items	Scale	Role
Digital Usability	DU1-DU5	5	Likert	Independent Variable
Operational Reliability	OR1-OR6	6	Likert	Independent Variable
Financial Inclusion Outcomes	F11-F16	6	Likert	Dependent Variable
Satisfaction and Intent	SI1-SI3	3	Likert	Dependent/ Mediator
Usage Patterns	Frequency, Channels, Purpose.	Single	Nominal	Control
Demographic	Age, Gender, Monthly income etc	Single	Nominal	Control

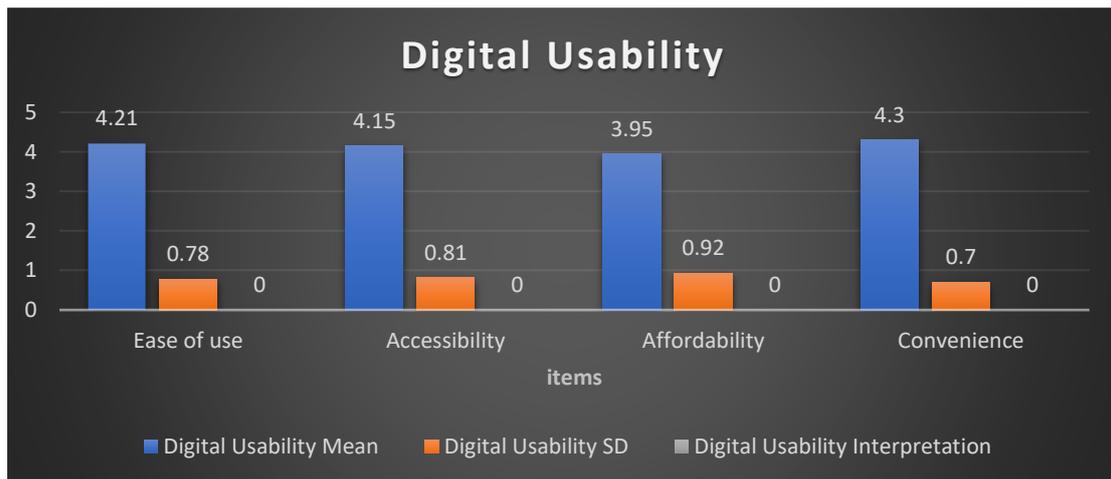
### Respondent profile (N-48)

Variables	Category	Frequency (n)	Percentage (%)	Interpretation
<b>Gender</b>	Male	19	40	Female respondents are more as compare to male indicating higher digital payment usage and more over shows stronger representation in digital banking adoption
	Female	29	60	
	Total	48	100	
<b>Location</b>	Urban	27	56	56% of respondents were from urban, reflecting better digital infrastructure and payment banking access. 33% of respondents were from rural, reflecting inclusion of underserved region but still lower access.
	Rural	16	33	
	Semi-urban	05	11	
	Total	48	100	

<b>Education</b>	Secondary	03	06	Only 6% of respondents have basic education, suggesting digital banking is adopted even by lower-skilled users. Highly educated users dominate with 79%, indicating digital banking adoption is strongest among sophisticated population.
	Graduate	05	10	
	Post-graduate	38	79	
	Others	02	04	
	Total	48	100	
<b>Employment</b>	Student	20	42	Students from the largest group, shows heavy usage of UPI and Mobile wallets. Salaried individuals show strong participation due to regular digital transactions. Unemployed and others involved only 20% indicating high transaction cost, low awareness.
	Salaried	15	31	
	Self-employed	03	06	
	Unemployed	05	10	
	Others	05	10	
	Total	48	100	
<b>Monthly Income</b>	Less than 10000	20	42	Majority earn very low income, proving digital payments are accessible for low-income users and its significantly representation of lower-middle-income users. High income group respondents are fewer perhaps preferring traditional banks. Income distribution confirms inclusion of low- and middle-income respondents relevant for financial inclusion research.
	10000-25000	12	25	
	25000-50000	10	21	
	50000-100000	04	08	
	Above 100000	02	04	
	Total	48	100	

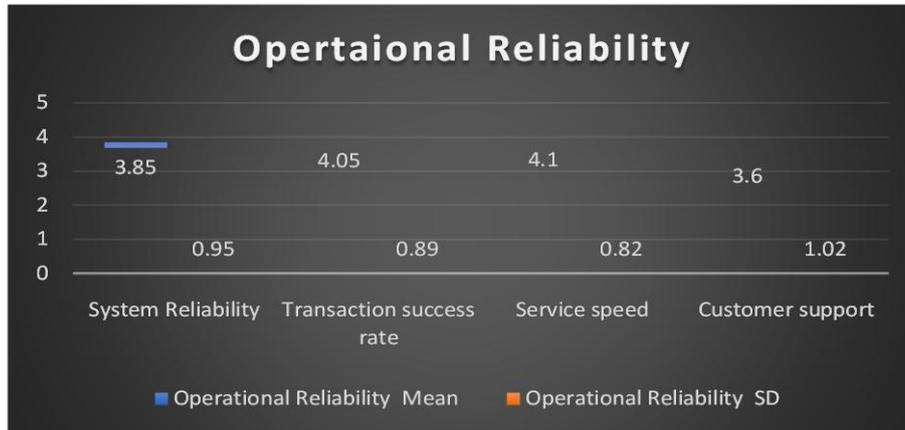
**Descriptive Analysis of Likert Scale Items**

- Digital Usability**



**Interpretation:** Users perceive payment banks as highly usable, accessible and convenient with affordability moderately positive. This indicates that digital banking usability positively contributes to financial inclusion.

**Operational Reliability**



**Interpretation:** Operational systems perform well except for customer support, which is the lowest-rated dimension. Overall reliability supports user satisfaction but improvement in customer support is essential.

**Usability and Operational reliability influence outcomes analysed with the help of correlation analysis**

Relationship	R-value	strength	interpretation
Digital Usability & Financial inclusion	0.64	Strong Positive	More usability=More financial inclusion
Operational reliability & User satisfaction	0.58	Moderate strong	Reliability increases satisfaction
Operational Reliability & Continued usage	0.52	Moderate	Better reliability=Higher loyalty

**Interpretation:** Digital usability strongly enhances financial inclusion, proving that payment banks support India’s inclusion agenda. Operational sustainability significantly affects user satisfaction confirming reliability is essential for digital trust. The weakest area is customer support, requiring policy and operational strengthening. With solid reliability and strong usability payment banks show sustainable potential for long-term digital financial inclusion.

**Finding and Suggestions**

- The present study indicates that customer support had the lowest mean score. Payment banks need to introduce all-time multilingual chatbots for resolving instant grievances, reducing waiting time in helplines, providing in-app complaint tracking to increase user trust, and improving reliability, satisfaction, and continued usage.
- Moderate scores on the system indicate service disruptions. To resolve this, banks should increase service capacity, implement real-time system load balancing, and introduce downtime alerts in apps to reduce transaction failures and enhance confidence in online payments.
- Despite the fact that usability scored high, continued improvement can expand inclusion by introducing voice-based navigation for low-literate users and simplified apps, menus using an icon-based interface, and providing step-by-step video tutorials in local languages. This results in extending inclusion to the low-digital literacy segment.
- Affordability was rated moderately; therefore, transaction fees should be reduced or eliminated. Partner with government programs for fee waivers to boost adoption among rural and low-income households.
- As observed, many users know how to transact but not how to safeguard. Payment banks need to strengthen awareness and digital literacy campaigns through organising village and college-level digital literacy workshops, safety awareness sessions on UPI frauds to improve safety and sustainable usage

### Limitations of the Study

- Present research study targeted only 2 districts for research.
- Small sample size.

### Conclusion

The transformative role of payments banks lies not in becoming mere transaction platforms but in serving as digital gateways to financial empowerment, particularly for the unbanked and underbanked populations. This pilot study aims to describe how digital usability significantly enhances financial inclusion among users and how operational reliability influences user satisfaction and the intention for continued use. Overall, payment banks hold strong potential for sustainable digital financial inclusion. The study confirms that a combination of user-friendly interfaces, reliable systems, and faster, affordable transactions creates a sustainable digital environment where financial inclusion can rapidly flourish.

### Future Research Scope

- The current research focused on only two districts for data collection; future researchers could expand their scope by including more districts.
- An empirical comparative study of conventional and non-conventional banking systems needs to be emphasized.

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