Awareness as Driver of Mobile Banking Adoption: An Empirical Study on Vadodara's Micro-entrepreneurs

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***Abstract*—The COVID-19 pandemic accelerated India's adoption of digital financial services, and mobile banking became a vital tool for individuals and microbusiness owners alike. This study looks at the awareness of mobile banking by Vadodara microentrepreneurs, who are crucial to the expansion of the local economy. As part of a descriptive research approach, 1,690 microentrepreneurs provided primary data via a structured questionnaire. The data was evaluated using a variety of methods, including the Shapiro-Wilk normality test, the Mann-Whitney test, the Kruskal-Wallis's test, the Kolmogorov-Smirnov test, and reliability testing. The findings states that awareness and knowledge of mobile banking vary significantly depending on demographic characteristics, particularly age and gender. As per the findings, male microentrepreneurs make up the majority of adopters, and those between the ages of 26 and 45 are the most active. Furthermore, over 74% of respondents were city dwellers, highlighting the uneven adoption distribution. Even though mobile banking is widely regarded as useful, secure, and essential for business growth, still it shows significant demographic disparities. This study illuminates adoption patterns specific to microentrepreneurs and makes the case that targeted interventions, increased awareness, and trust-building are necessary to boost digital financial inclusion in semi-urban and rural areas.**

***Index Terms*—Adoption, Awareness, Micro-entrepreneurs, Mobile Banking, Digital Payments,**

I. INTRODUCTION

COVID-19 has severely limited people's lives. The lockdown period in India, which lasted for a few months in 2020, has altered India's payment methods due to changes in lifestyle. While householders in the upper and medium segments were primarily at home, the poorest group struggled to meet their demands. Individuals from various backgrounds were learning how to utilize digital transactions and figuring out how to live, work, and transact.

A lasting underlying digital DNA to government programs like Digital India, Jan Dhan Yojna, PM SVANidhi plan for street sellers, DBT release, requiring NETC FASTag for tolling, etc., further pushed problem finding to the basic level. The government's epoch-making welfare spending must also reach the appropriate target group. The RBI set the sanctioning tone by recommending V-KYC, contactless mercantilism, online payments, recurring card and UPI payments, standardizing QR codes, and expanding the range of BBPS categories. Banks, fintech's, payment providers, and business correspondents all contributed significantly by speeding up their digital initiatives and innovating rapidly to close the gaps for merchants and consumers.

The independent, non-profit research center PRICE (People Research on India's Consumer Economy & Citizen Environment) conducted a study in partnership with NPCI to monitor household awareness, adoption, and usage patterns of digital payments. Some intriguing new information is presented in the paper.

The primary forces behind the increase in awareness and adoption of digital payments were advantages like safety, ease, and immediate payment. We were happy to discover that digital payments were adopted across all over market categories, with 36% of the families surveyed using them for the first time during the lockdown. The small SMS has held up well and demonstrated once again how important SMS communication is to providing users with security and assurance. It becomes clear-cut that people are

ready for the digital age and that adoption barriers need to be continuously removed by the supply-side.

NPCI has picked up the cues with the ecosystem drive towards UPI awareness, contactless card payments, led by RuPay NCMC contactless cards (National Common Mobility Card), expansion of NETC FASTag to state tolling and BBPS across categories. This leads to underpinned with the safety and awareness agenda.

The adoption of mobile banking has become a significant concern in the banking industry since it is crucial to future projections and the digital transformation of financial institutions (Goularte & Zilber, 2019). The widespread use of state-of-the-art telecommunications technologies has made mobile banking popular with the general public (An Exploratory Analysis of Mobile Banking Adoption and Consumer Behavior in Coimbatore City, 2019). High awareness is one of the primary factors influencing the use of mobile banking services. Additionally, a lot of research has been done to identify the factors that affect the adoption of mobile banking (Panas & Wilczyńska, 2019). These factors admit perceived utility, expected ease of use, trust, social influence, expected danger, self-efficacy, enabling circumstances, resistance, and particular demographic traits. The relationship between the rate of mobile device penetration, the speed of mobile connections, and the use of mobile banking can be further investigated in some countries where this area has not gotten much attention.

Future studies can be conducted in different cultural and environmental contexts to highlight further unexplored barriers to mobile banking adoption. These studies can utilize qualitative methods, such as focus groups and interviews, to gain an in-depth knowledge.

Mobile Banking:

Mobile banking is the practice of utilizing banking services and conducting financial transactions via a mobile device, such as a smartphone or tablet. Customers can manage their bank accounts, transfer money, pay bills, check balances, apply for loans, and perform other financial operations using mobile applications or SMS-based services instead of physically visiting a bank branch. In a nutshell, mobile banking gives customers speed, convenience, and security by enabling banking services "anytime and anywhere." It is a vital instrument that encourages financial inclusion, especially in countries that are developing, by offering banking services to individuals in remote or underserved areas.

Factors Considered for Mobile Banking

Numerous factors have been found to have an effect on the adoption of mobile banking. This includes hedonic incentives, price value, favorable conditions, expectancy of performance, development of habits, system quality, and service quality. In addition to these fundamental drivers lie perceived ease of use, social influence computer self-efficacy, perceived financial cost security, and trust. It is acknowledged that state hurdles, including those pertaining to pricing and usage, as well as risk obstacles, are preventing the widespread adoption of mobile banking. Nonetheless, a notable gap exists in research concerning post-adoption loyalty after mobile banking implementation suggesting an area for future investigation. Furthermore, it is crucial to recognize that adoption mechanics may vary across various cultures and environments; ultimately calling for additional thorough exploration within these domains.

About NPCI:

The National Payments Corporation of India (NPCI) was founded in 2008 to supervise the functioning of India's retail payment and settlement systems. Thanks to NPCI, the country now has a robust payment and settlement system. It has transformed the way that payments are made in India through a range of retail payment products, such as the RuPay card, Immediate Payment Service (IMPS), Unified Payments Interface (UPI), Bharat Interface for Money (BHIM), Aadhaar Enabled Payment System (AePS), National Electronic Toll Collection (NETC), and Bharat BillPay. NPCI is steadfastly striving to make India a digital economy and is concentrated on implementing technological advancements in retail payment systems. It is supporting India's goal of becoming a completely digital society by providing affordable, safe payment options that are accessible throughout the country.

Roles & Responsibilities of NPCI

- NPCI owns and operates the Unified Payments Interface (UPI) platform
- In relation to UPI, NPCI sets guidelines, standards, and the obligations, liabilities, and roles of the various participants. This also

includes removing settlement deadlines, processing and settling transactions, and resolving disputes.

- The NPCI allows Issuer Banks, PSP Banks, Third Party Application Providers (TPAP), and Prepaid Payment Instrument issuers (PPIs) to take part in UPI.
- NPCI offers a UPI system and network that is safe, secure, and reliable.
- For members taking part in UPI, NPCI offers online transaction routing, processing, and settlement services.
- In addition to requesting data, information, and records related to UPI participants, NPCI has the power to audit UPI participants directly or through a third party.
- Banks taking part in UPI are given access to the system by NPCI, which allows them to download information, file chargebacks, check the status of UPI transactions, and more.

Unified Payments Interface (UPI)

A single mobile application (of any participating bank) that integrates multiple banking features, seamless fund routing, and merchant payments is called the Unified Payments Interface (UPI). It also facilitates "Peer to Peer" collect requests, which can be scheduled and funded based on necessity and convenience.

With the aforementioned context in mind, NPCI conducted a test launch with 21 member banks. The pilot was started on April 11, 2016, by Dr. Raghuram G. Rajan, the Governor of the RBI in Mumbai. Banks started to upload their UPI-capable apps to the Google Play store on August 25, 2016.

How it is Unique?

Instant Transfers Anytime: This feature is available 24/7 and enables instant money transfers through mobile devices.

Unified Access: A single mobile application makes it simple to access multiple bank accounts.

Secure authentication: It ensures strong security while maintaining a seamless payment process by providing two-factor authentication with a single click that conforms with legal requirements.

Enhanced Privacy: Because push and pull transactions are carried out using a virtual address, private data such as a card number, account number, or IFSC code is kept private.

QR Code Integration: Makes it possible to quickly and safely make payments by scanning QR codes.

Transaction Convenience: Addresses issues with cash-on-delivery, exact change, and ATM withdrawals.

Merchant and In-App Payments: Allows merchant transactions and in-app payments to be made using a single application.

Scalable: Distributed utility bills, over-the-counter transactions, QR-based payments, donations, and collections are just a few of the payment options that are accepted.

User Empowerment: Provides the option to lodge complaints directly from the mobile application.

% of household in each income group who have...	Income groups			Total
	Bottom 40%	Middle 40%	Top 20%	
Have smart phone	57%	72%	90%	68%
Do digital payments	**24%**	34%	**49%**	32%
Have mobile app for bank	14%	37%	59%	31%
Use phone for banking related matters	5%	17%	30%	14%

Source:https://www.npci.org.in/PDF/npci/knowledge-center/Digital-Payment-Adoption-in-India-2020.pdf

Fig:1 Status of Online Banking

As per Fig 1: There is a 36% gap between smartphone owners and digital payment users. The opportunity to reduce the disparity between app downloads and usage through education is clear and low-hanging fruit.

II. LITERATURE REVIEW

Nandru Prabhakar (2025) The proposed research methodology is the expanded framework of the UTAUT2 and incorporates two additional variables: perceived security (PS) and perceived trust (PT). 436 samples were chosen from among Indian consumers who have utilized m-payment services using the online survey method. The data analysis and proposed hypothetical linkages were analysed using structural equation modeling techniques and confirmatory factor analysis. The results confirm that performance expectancy, effort expectancy, facilitating conditions, PS, PT, habit, and price value are all antecedents of consumers' intention to adopt m-payment services. Furthermore, behavioral

intention significantly influenced the actual use of m-payment services during the COVID-19 pandemic.

Imdadullah Hidayat-ur-Rehman et.al (2025) By combining self-determination theory (SDT) and diffusion of innovation (DOI) theory, the authors present a model that includes concepts such as perceived security (PS), perceived trust (PT), compatibility, ease of use (EOU), perceived financial autonomy (PFA), perceived financial competence (PFC), relative advantage (RA), and intention-to-use (IU). This study used a survey-based methodology to gather data from m-wallet users in Bangladesh. 393 of the 445 poll participants were deemed valid and chosen for additional examination. The study's findings show that PFC significantly influences IU and PFA m-wallets.

Salman Khan (2024) This study uses UTAUT in addition to the additional dimensions of social influence, trust, anxiety, personal innovativeness, and grievance redressal (GR). Structural equation modeling is utilized to analyse the prediction model of attitudes toward m-payment. People's responses to questions concerning their attitudes and intentions regarding accepting mobile payments were gathered and examined using the expanded UTAUT model. An actual analysis of the model revealed that, despite maintaining the traditional function of TAM, users' attitudes and intents are influenced by social influence, trust, and individual inventiveness. Furthermore, GR and willing to use are powerful predictors of m-payment usage patterns.

Dhinakaran, D. P (2021) Mobile banking has appeared as an important trend in the banking sector. The study represents how customers view mobile banking. Participants were shared a self-administered questionnaire, and 267 effectual results were obtained out of 350. For the SPSS analysis of the data, the primary focus areas were demographic profiles, mobile banking knowledge, time efficiency, trust, comfort, ease of use, security, and perceived benefits. Chi-square testing and percentage analysis were used to interpret the findings. The study also examines consumers' awareness and familiarity with mobile banking's offerings, as well as their general opinions about it.

Choung, Y., Chatterjee (2023) The summary shows the evolution of research on mobile banking, or m-banking, from 2000 to 2020, beginning with the first article in the Scopus database. VOSviewer and Excel were utilized to do bibliometric and content analysis on 1,206 papers. The findings signal a rise in publications globally, with mobile telecommunications systems consistently emerging as the most popular subject. The study spotlight significant changes in the language used in m-banking and emphasizes the value of keeping an eye on future developments, particularly in light of global movements. As the initial comprehensive multi-period bibliometric analysis, it offers a framework for guiding future studies in this field.

Mulia, D., Usman, H., & Parwanto, N. B. (2021). This study adds external variables like customer intimacy, perceived risk, trust, and Sharia compliance to the TAM in order to evaluate how Islamic bank customers use e-banking and m-banking. Data were collected using a self-administered survey, and analyses were conducted using multiple regression and multivariate analysis of variance. The findings show that customer intimacy not only directly boosts customer loyalty but also indirectly does so through perceived utility, satisfaction, risk, trust, Sharia compliance, and ease of use. Therefore, assessing customer satisfaction and retaining loyalty in Islamic banking depend heavily on customer intimacy.

III. RESEARCH METHODOLOGY

Research Problem

Clearly state the research problem: "What factors influence the adoption of mobile banking among microentrepreneurs in Vadodara?" This research problem aims to investigate the adoption of mobile banking technology among microentrepreneurs in Vadodara, a significant demographic that extort to local economic development. The study will explore: Demographic Factors which helps in analyzing how variables such as age and gender, play a role in adopting mobile banking

Research Objectives:

- To study the awareness and knowledge of mobile banking among microentrepreneurs in Vadodara.
- To establish the extent to which micro-entrepreneurs have adopted mobilebanking in Vadodara
- To examine the significance of demographic factors for mobile banking awareness among microentrepreneurs.

Research Design: Descriptive Research Design
Sampling Design: Non-Probability Convenience Sampling
Population: Micro-entrepreneurs of Vadodara
Sample Size: 1690
Data Collection Method: Primary Method
Data Collection Tool: Questionnaire
Data Analysis Tools: Cronbach's Alpha, Konglomorov Test, Krushal Wallis Test, Mann Whitney Test.

IV. DATA ANALYSIS

A) Reliability Testing

With a Cronbach's Alpha of 0.973, the 7 item about the awareness among the micro entrepreneurs for Mobile Banking in questionnaire demonstrates good internal consistency. This suggest that the items are well correlated and consistently measure the same underlying construct, making the instrument reliable for the intended measurement.

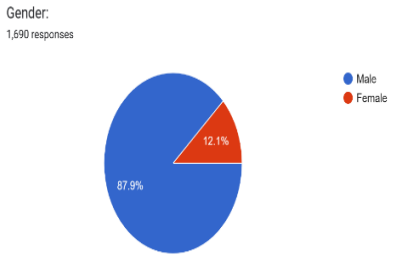
Table: I Cronbach's Alphas Test for Construct Awareness and Knowledge

	Scale Mean	Scale Variance	Corrected Item-	Cronbach's Alpha
I am aware of mobile banking services and platforms available for business transactions, including those specifically designed for micro-entrepreneurs	9.55	02.880	735	.972
I regularly seek or receive information about mobile banking services relevant to my business.	9.84	00.480	752	.972
I am knowledgeable about the key features of mobile banking apps, such as payment processing, fund transfers, and loan management.	9.87	97.508	772	.972
I understand the security measures, such as encryption and two-factor authentication, that protect mobile banking transactions.	0.00	96.433	752	.972
I am familiar with the regulatory requirements governing mobile banking for business transactions in my country.	9.99	96.372	761	.972
I am aware of mobile banking solutions tailored for small businesses and microentrepreneurs.	9.98	96.611	758	.972
I stay updated on new mobile banking services and features that could enhance my business operations.	9.99	94.510	769	.972

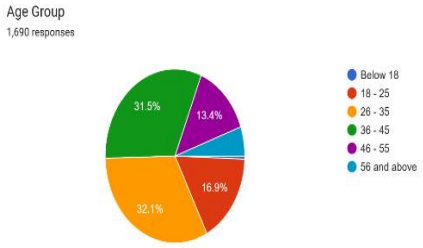
As the Cronbach's Alpha of all the statements is more than 0.9, it can be interpretated that data is excellently reliable to perform the test.

B) Demographic Profile

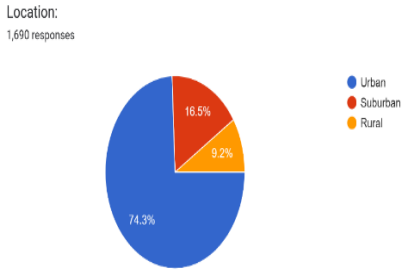
i. Gender Wise Distribution



ii. Age-wise Distribution



iii. Location Distribution



iv. Years in Business

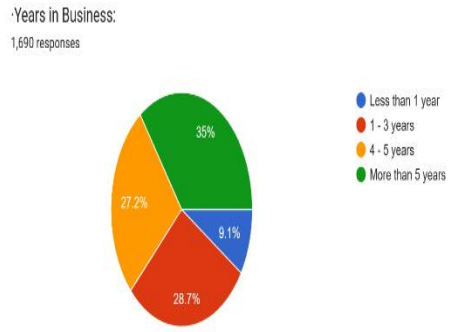


Chart 1 states that 89% of the communicator were male, so very few (21%) female Micro-entrepreneurs were involved with the Mobile Banking. Chart 2 represents the relative quantity of the Micro-entrepreneurs were in the age group of 26 - 35 years (32.1%) and 36 to 45 years (31.5%), while 18 - 25 years (16.9 %) and 46- 55 years (13.4%) are few and rest of the remaining belong to above 56 years age group. Chart 3 represents area of residency of the Micro-entrepreneurs i.e. urban, rural and suburban business development which is 74%, 9% and 17% respectively. Majority of the Micro-entrepreneurs deal in the Urban areas. Chart 4 states how long the communicator were into the microenterprises. Majority (35%) of them were into business from more than 5 years, while 29% doing business form approx. 1 to 3 years and 27% respondents dealing business from 4-5 years.

C) Normality Testing for Awareness and Knowledge of Mobile Banking

Null Hypothesis (H0): Data is Normally Distributed

Alternate Hypothesis (H1): Data is Not Normally Distributed

Table -II Normality Testing by Kolmogorov Test

	Kolmogorov-Smirnov[a]		
	Stats	df	Sig.
I am aware of mobile banking services and platforms available for business transactions, including those specifically designed for microentrepreneurs	.255	1690	<.001
I regularly seek or receive information about mobile banking services relevant to my business.	.257	1690	<.001
I am knowledgeable about the key features of mobile banking apps, such as payment processing, fund transfers, and loan management.	.247	1690	<.001
I understand the security measures, such as encryption and two-factor authentication, that protect mobile banking transactions.	.238	1690	<.001
I am familiar with the regulatory requirements governing mobile banking for business transactions in my country.	.232	1690	<.001
I am aware of mobile banking solutions tailored for small businesses and microentrepreneurs.	.243	1690	<.001
I stay updated on new mobile banking services and features that could enhance my business operations.	.226	1690	<.001

Kolmogorov tests' P -values are less than 0.001, which means the Null Hypothesis is Rejected. This indicates that all the statements of Awareness constructs represents that the data is not normally distributed.

D) ann- Whitney Test considering Gender and Awareness and Knowledge about Mobile Banking

Null Hypothesis (H0): Awareness and Knowledge of Mobile Banking Does Not Differ Significantly Across Gender

Alternate Hypothesis (H1): Awareness and Knowledge of Mobile Banking Does Differ Significantly Across Gender

Table – III Mann -Whitney Test Results for Gender and Awareness

Awareness & Knowledge	Sig.
I am aware of mobile banking services and platforms available for business transactions, including those specifically designed for microentrepreneurs	0.008
I regularly seek or receive information about mobile banking services relevant to my business.	0.000
I am knowledgeable about the key features of mobile banking apps, such as payment processing, fund transfers, and loan management.	0.000
I understand the security measures, such as encryption and two-factor authentication, that protect mobile banking transactions.	0.000
I am familiar with the regulatory requirements governing mobile banking for business transactions in my country.	0.000
I am aware of mobile banking solutions tailored for small businesses and microentrepreneurs.	0.001
I stay updated on new mobile banking services and features that could enhance my business operations.	0.000

As the P value is less than 0.05, the null hypothesis is rejected, which indicates that the distribution of Awareness and Knowledge of Mobile Banking Does differ Significantly Across Gender groups.

E) Kruskal Wallis Test considering Age and Awareness about Mobile Banking

Null Hypothesis (H0): Awareness and Knowledge of Mobile Banking Does Not Differ Significantly Across Age

Alternate Hypothesis (H1): Awareness and Knowledge of Mobile Banking Does Differ Significantly Across Age

Table -IV Kruskal Wallis Test considering Age and Awareness about Mobile Banking

Statements	Kruskal-Wallish	df	P. Sig.
I am aware of mobile banking services and platforms available for business transactions, including those specifically designed for micro-entrepreneurs	77.025	5	0.000
I regularly seek or receive information about mobile banking services relevant to my business.	79.893	5	0.000
I am knowledgeable about the key features of mobile banking apps, such as payment processing, fund transfers, and loan management.	59.689	5	0.000
I understand the security measures, such as encryption and two-factor authentication, that protect mobile banking transactions.	50.179	5	0.000
I am familiar with the regulatory requirements governing mobile banking for business transactions in my country.	44.946	5	0.000
I am aware of mobile banking solutions tailored for small businesses and micro-entrepreneurs.	41.454	5	0.000
I stay updated on new mobile banking services and features that could enhance my business operations.	60.018	5	0.000

The Kruskal–Wallis's test indicated a statistically significant difference in Awareness and Knowledge for Mobile Banking across the age groups as the p value of all the statements of the constructs are less than 0.05. This indicates that the distribution among the groups is not equal.

V. FINDINGS

Relative quantity of the Micro-entrepreneurs was male. Number of the Micro-entrepreneurs lie in to the

age group of 26-45 years. More than 74% of the respondents' area of residence is Urban area. Bulk of the Micro-entrepreneurs were into the business from more than 5 years.

Supported on the Cronbach's alphas measure it can be stated that the data is reliable. The Normality testing based on Kolmogorov-Smirnov states that the data is not normally distributed and hence the nonparametric test have been applied to interpret the implication level of Demographic variables with regards to the awareness and knowledge of Mobile Banking.

Awareness and knowledge of Mobile banking is significantly differed among the demographic variables such as Gender and Age groups supported by the hypothesis testing.

VI. CONCLUSION

The survey concludes that mobile banking has become crucial for microbusiness owners, serving as both a need and a convenience in the modern corporate setting. The results demonstrate the significant influence of age and gender on awareness and adoption, with male microentrepreneurs and those between the ages of 26 and 45 demonstrating higher levels of engagement. Urban microentrepreneurs demonstrated greater adoption rates than their rural counterparts, underscoring the importance of infrastructure and educational initiatives in bridging the digital divide. Reliability testing confirmed the instrument's resilience, while hypothesis testing showed that demographic factors have a significant impact on the adoption of mobile banking. Despite the widespread recognition of the benefits of mobile banking, such as its efficiency, safety, and easiness of use, barriers pertaining to digital literacy, security concerns, and demographic disparities persist. Therefore, lawmakers, financial institutions, and fintech companies need to collaborate to develop inclusive, user-friendly, and trust-enhancing solutions. Mobile banking has the potential to become a useful tool for advancing financial inclusion and sustaining the financial growth of microbusiness owners in Vadodara and beyond if these barriers are removed.

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