*Advances in Consumer Research*
https://acr-journal.com/
Volume-3 | Issue 9 (Special Issue CPIMASS) | 30th June: 2026

*Original Researcher Article*

# Digital Inclusion and Financial Literacy: Key Drivers of Technology Adoption in NBFCs

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ABSTRACT

**Purpose-** The study examines the role of digital inclusion and financial literacy in driving technology adoption among customers of Non-Banking Financial Companies (NBFCs). It explores how these factors influence customer engagement with digital financial services, particularly in underserved regions.

**Design/Methodology/Approach-** This research adopts a qualitative case study-based approach, focusing on two leading NBFCs—Cholamandalam Finance and Muthoot Finance. Primary data is collected through in-depth interviews with customers and NBFC executives, while secondary data is gathered from reports, regulatory guidelines, and company case studies. Thematic analysis is used to identify key challenges and best practices in digital adoption.

**Findings-** The study highlights that higher levels of financial literacy and digital accessibility lead to increased adoption of digital financial services. However, significant barriers such as trust deficits, cybersecurity concerns, lack of personalized assistance, and digital literacy gaps continue to hinder widespread adoption. Successful NBFCs address these challenges through financial literacy programs, user-friendly digital platforms, and hybrid service models that blend technology with human assistance.

**Practical/Social Implications-** The findings provide actionable insights for NBFCs, policymakers, and financial institutions to enhance digital financial inclusion. Implementing customer education initiatives, strengthening cybersecurity frameworks, and adopting localized digital service models can improve technology adoption. Additionally, the study underscores the need for regulatory interventions to support digital financial literacy programs.

**Originality/Value-** This research contributes to the limited qualitative literature on digital financial adoption in the NBFC sector. By focusing on real-world case studies, it offers practical recommendations for improving digital accessibility and customer confidence. The study also provides a framework for future research on digital transformation in financial services, particularly in emerging economies.

**Keywords:** Digital Inclusion, Financial Literacy,Technology Adoption, Non-Banking Financial Companies (NBFCs), FinTech

## INTRODUCTION

The financial landscape in India has witnessed a significant transformation in recent years, driven largely by the integration of digital technologies across financial services. Non-Banking Financial Companies (NBFCs), which play a vital role in delivering credit and financial services to underserved and unbanked populations, have been at the forefront of adopting digital solutions (Gautam et al., 2022). These include mobile applications for loan processing, online payment platforms, automated credit scoring, customer service chatbots, and digital Know Your Customer (e-KYC) procedures. The adoption of such technologies has enhanced operational efficiency, reduced turnaround time, and broadened the outreach of financial products and services (Rastogi & Singh, 2021).

However, despite these advancements, the effectiveness of technology adoption among NBFC customers remains uneven, especially in semi-urban and rural regions of India (Chin et al., 2022). A significant portion of the population that NBFCs aim to serve lacks adequate digital access and skills, which are essential for engaging with digital financial services. This phenomenon is referred to as digital exclusion, wherein individuals are unable to participate in the digital economy due to factors such as limited access to smartphones, poor internet connectivity, or low levels of digital literacy (Verma & Shome, 2025).

Another critical barrier is the lack of financial literacy. Even when digital infrastructure is available, many customers struggle to understand basic financial concepts and digital tools, making them hesitant to use digital platforms for financial transactions (Manyika et al., 2016). This hesitancy is often reinforced by trust issues, fear of fraud, data security concerns, and negative experiences with technology-based services. As a result, the benefits of digital transformation in NBFCs are not fully realized, particularly among their target customer base -low-income, semi-literate, and geographically dispersed communities (Hermawan & Lestari, 2022).

In this context, digital inclusion and financial literacy emerge as key enablers of successful technology adoption. Digital inclusion ensures that all individuals, regardless of their location or socio-economic background, have access to digital tools and services (Sharma & Shastri, 2020). Financial literacy, on the other hand, equips customers with the knowledge and confidence needed to manage digital transactions securely and effectively (Hasan & Hoque, 2022). When these two elements are combined, they can significantly enhance the customer experience and service outreach of NBFCs.

Given the increasing reliance on digital platforms and the critical need for inclusive finance, it becomes imperative to understand how digital inclusion and financial literacy influence the adoption of technology among NBFC customers (Jain & Raman, 2022). This study, therefore, aims to explore these factors in depth, using case studies from leading NBFCs such as Cholamandalam Finance and Muthoot Finance, to provide insights into current challenges, best practices, and potential strategies for improving digital engagement in the sector.

### *1.1 Problem Statement*

The Non-Banking Financial Company (NBFC) sector in India has evolved significantly in recent years, with many firms embracing digital transformation as a means to enhance operational efficiency, reduce costs, and reach a broader customer base. The deployment of digital solutions such as mobile applications, AI-based credit assessments, digital loan disbursements, e-KYC, and automated customer support systems has enabled NBFCs to offer faster and more convenient services, particularly in a post-pandemic world where contactless and remote transactions are increasingly preferred.

However, despite these innovations, a considerable gap persists between the availability of digital financial services and the actual adoption of these services by customers, especially in semi-urban and rural areas. While NBFCs are investing in advanced technologies, many of their customers struggle to access and use these digital platforms effectively. This gap stems from a combination of factors, most notably limited digital literacy, low levels of financial awareness, poor internet connectivity, lack of trust in digital systems, fear of online fraud, and the perceived complexity of digital interfaces.

Moreover, a significant portion of NBFC customers belong to marginalized or economically weaker sections of society, many of whom are first-time digital users or lack formal education. These customers often rely on traditional, face-to-face financial transactions and are hesitant to transition to digital platforms due to fear of making errors or being cheated. This digital divide not only prevents customers from enjoying the full benefits of NBFC digital services but also limits the return on investment for NBFCs that have invested heavily in technology adoption.

The problem is further compounded by the absence of targeted digital literacy and financial education programs for these customers. Without a strong foundation of financial knowledge and digital familiarity, customers are unlikely to trust or effectively utilize digital tools provided by NBFCs. In turn, this slows down the sector's progress toward inclusive, technology-enabled financial services.

Given this scenario, there is an urgent need to investigate the critical role that digital inclusion and financial literacy play in influencing technology adoption among NBFC customers. It is important to understand the barriers to digital adoption, identify the strategies that have worked in specific contexts, and explore how NBFCs can bridge the digital divide through customer-centric innovations and education.

This study aims to address this gap by examining the effectiveness of technology adoption from the customer's perspective, focusing on the enabling roles of digital inclusion and financial literacy. By analyzing real-life case studies of NBFCs such as Cholamandalam Finance and Muthoot Finance, the research will provide a grounded understanding of current challenges, potential solutions, and pathways to enhance customer engagement in a digitally transforming financial ecosystem.

### *1.2 Objectives of the study*

- To examine the role of digital inclusion in improving access to and usage of NBFC digital financial services.
- To assess the impact of financial literacy on customer trust, confidence, and engagement with digital financial services.
- To identify key barriers faced by NBFC customers in adopting technology-enabled services.
- To analyze how leading NBFCs, such as Cholamandalam Finance and Muthoot Finance, address these challenges through their service delivery models.
- To recommend strategic interventions for NBFCs, policymakers, and stakeholders to enhance digital financial adoption and literacy.

## 2. LITERATURE REVIEW

The Non-Banking Financial Company (NBFC) sector in India has increasingly become an important channel for financial inclusion, especially for the underbanked and underserved populations (Ozili, 2018). With the advent of digital technologies, NBFCs have embraced digital platforms to offer faster, more convenient, and scalable financial services. However, despite the availability of these services, the uptake and effectiveness of technology adoption among customers remain uneven. This disparity has brought two critical enablers into focus: digital inclusion and financial literacy (Nehra et al., 2024).

The literature on technology adoption in financial services highlights various models and frameworks, such as the Technology Acceptance Model (TAM) (Natasia et al., 2022) and the Unified Theory of Acceptance and Use of Technology (UTAUT) (Aytekin et al., 2022), which identify key variables influencing user behavior. However, in the context of NBFCs, particularly in semi-urban and rural India, the success of digital transformation efforts depends not just on the availability of technology but on the customer's ability to access, understand, and trust that technology (Gautam et al., 2022). This section reviews the existing literature on digital inclusion, financial literacy, and their relationship with technology adoption in the NBFC and broader financial services ecosystem.

### *2.1 Digital Inclusion and Financial Accessibility*

**Digital inclusion** refers to the process of ensuring that all individuals and communities, including the most disadvantaged, have access to and the ability to use information and communication technologies (ICTs) (Siddiqui & Siddiqui, 2020). It is a multi-dimensional concept that encompasses access to devices (like smartphones), reliable internet connectivity, digital literacy, and user-friendly platforms that are inclusive in terms of language, design, and accessibility.

Several studies underscore the importance of digital inclusion as a prerequisite for financial inclusion in the digital era (Gallego-Losada et al., 2022). According to the World Bank (2020), digital financial services can significantly expand access to finance for individuals who are traditionally excluded from the formal financial sector. However, this potential can only be realized if customers have the necessary digital access and skills (Choudhary et al., 2025).

In India, while mobile penetration has increased considerably, and digital transactions are growing due to the push from initiatives like Digital India and Jan Dhan Yojana, disparities remain in terms of quality and consistency of access (Parvin & Panakaje, 2022). For instance, rural areas continue to face infrastructure challenges, such as weak mobile networks and limited access to smartphones and internet data (Rastogi & Singh, 2021). This digital divide becomes a significant barrier for NBFCs trying to serve remote customers through digital platforms.

Internet access and mobile connectivity have been shown to correlate positively with the usage of digital financial services. As per the GSMA Mobile Economy Report (2021), India had over 500 million internet users, but digital exclusion persists among low-income and older populations, particularly women in rural areas. These demographics often overlap with the target market of NBFCs (Sharma & Shastri, 2020).

Furthermore, platform usability and inclusiveness play a crucial role in enabling digital inclusion. Digital financial service platforms must cater to the needs of users with low literacy, multiple languages, and minimal digital exposure. Studies have highlighted the importance of simplified user interfaces, regional language support, and assisted digital services to improve adoption among digitally excluded groups (Durai & Stella, 2019).

Recent research also emphasizes that digital inclusion is not merely about providing access but ensuring that access translates into meaningful use (Verma & Shome, 2025). That is, users must be able to confidently navigate digital platforms, perform financial transactions, and resolve issues without fear or confusion. This aspect becomes even more critical in NBFC operations, where customers are expected to apply for loans, track repayments, or access credit-related services online (Bhosale, 2020).

In the case of NBFCs such as **Muthoot Finance** and **Cholamandalam Finance**, digital inclusion efforts include the development of mobile apps, WhatsApp-based communication, and e-KYC mechanisms. However, without adequate infrastructure and digital readiness among customers, these services risk being underutilized (Hasan & Hoque, 2022).

Thus, the literature strongly suggests that digital inclusion is a foundational requirement for technology adoption in financial services (Sinha et al., 2023). For NBFC customers, especially in Tier II and Tier III cities and rural areas, digital inclusion determines whether they can fully benefit from the digital shift in financial services (Bachas et al., 2018). This insight reinforces the need for NBFCs and policymakers to not only invest in digital tools but also ensure the ecosystem is ready to support customer access and usage.

### *2.2 Financial Literacy and Customer Behavior*

**Financial literacy** refers to the ability of individuals to understand and effectively use various financial skills, including personal financial management, budgeting, and investing (Sugangga et al., 2023). In the digital age, this concept also includes the ability to comprehend and navigate digital financial platforms, make informed decisions regarding online transactions, and understand the risks associated with digital financial tools (Lusardi & Messy, 2023).

Numerous studies have established a strong relationship between financial literacy and customer behavior, particularly in the context of adopting new technologies in the financial sector (Carrière-Swallow et al., 2021). Customers who possess basic financial knowledge are more likely to engage confidently with digital financial services, understand the benefits of using them, and make well-informed decisions. This is especially crucial in the NBFC sector, where many customers are first-time users of formal credit and savings mechanisms (Karakurum-Ozdemir et al., 2018).

A key aspect of financial literacy in this context is its role in building trust and confidence in digital services. Customers who understand how digital lending workshow to calculate interest, repayment schedules, or assess their creditworthiness are better positioned to use NBFCs' digital platforms effectively. Conversely, low financial literacy can lead to confusion, mistrust, and avoidance of digital services altogether.

Research by the OECD and World Bank has found that in developing economies, including India, low financial literacy is a major barrier to financial inclusion, especially when services are offered through digital channels. A lack of understanding often results in fear of making mistakes, vulnerability to fraud, and reluctance to shift from traditional, in-person financial transactions to online platforms (Jain & Raman, 2022).

Further, behavioral economics literature highlights that financial decisions are not solely driven by logic but are deeply influenced by psychological factors, such as perceived risk, past experiences, and social influence. For customers with limited financial education, digital financial products may appear complex or risky, leading to lower adoption rates despite improved access (Agyekum et al., 2022). This behavior is especially relevant in rural areas, where community perceptions and local influencers play a strong role in shaping customer trust.

In the Indian context, initiatives such as RBI's financial literacy campaigns, National Strategy for Financial Education (NSFE), and NBFC-led awareness drives have attempted to improve the baseline financial knowledge among consumers (Koskelainen et al., 2023). Yet, many NBFC customers remain unaware of how to use digital financial tools securely and effectively. The absence of targeted, culturally relevant, and language-accessible financial literacy programs continues to hinder widespread digital adoption.

Case studies of institutions like **Cholamandalam Finance** and **Muthoot Finance** reveal efforts to bridge this gap through digital onboarding support, multilingual assistance, and simplified educational content (Grohmann et al., 2018). However, the challenge lies in scaling these initiatives across diverse customer segments, especially where literacy and digital familiarity levels are low.

Thus, the literature suggests that financial literacy is not just a desirable attribute- it is a critical enabler of customer trust, satisfaction, and engagement with digital services. (Lusardi & Mitchell, 2023). Without it, technology adoption among NBFC customers may remain superficial, limited to basic transactions, or altogether absent.

Thus, enhancing financial literacy among NBFC customers especially those in rural and underserved areas- is essential for building the trust and confidence required for sustained use of digital financial services. For NBFCs, investing in customer education is not merely a social responsibility but a strategic imperative to ensure the success of their digital transformation journeys.

### 2.3 Challenges in Technology Adoption

While the adoption of digital technologies offers immense potential for Non-Banking Financial Companies (NBFCs) to extend their reach and improve service delivery, a range of barriers hinder effective technology adoption, particularly among customers in semi-urban and rural India (Al-Emran & Griffy-Brown, 2023). Despite the presence of digital platforms, many customers fail to fully utilize these services due to a combination of cybersecurity concerns, digital illiteracy, platform usability issues, and a pervasive trust deficit. Understanding these challenges is essential to building inclusive, customer-centric digital financial systems (Prause, 2019).

#### a) Cybersecurity Risks and Fear of Fraud

Cybersecurity remains a significant concern in the adoption of digital financial services. Customers are increasingly aware of the potential for online fraud, phishing scams, data breaches, and identity theft (Holgersson et al., 2021). These risks, whether experienced personally or heard through community narratives, can severely damage customer trust in digital platforms. According to the Reserve Bank of India (RBI), digital fraud cases have risen with the expansion of online financial services, especially among first-time or low-literacy users who are often less equipped to detect fraudulent schemes (Carrière-Swallow et al., 2021).

In the NBFC context, where customers may already have limited financial experience, the fear of losing money through digital transactions becomes a strong deterrent. This fear often leads to an overreliance on physical branches, agents, or cash-based transactions, even when digital alternatives are available (Tripathi & Tripathi, 2024).

#### b) Digital Illiteracy

Digital illiteracy, defined as the inability to effectively use digital devices and platforms, is one of the most significant barriers to technology adoption in India's financial sector (Baskakova & Soboleva, 2019). Many NBFC customers, particularly in rural and remote regions, lack basic digital skills such as operating smartphones, navigating mobile apps, or understanding authentication processes like OTPs and biometric verification (Nag et al., 2023).

This problem is often compounded by language barriers, low educational attainment, and the absence of tailored digital onboarding programs. Without structured guidance, customers may feel overwhelmed by the interfaces and processes, resulting in low usage or complete avoidance of digital services (Metting & Hage, 2024).

#### c) Usability and Accessibility Issues

Even when digital literacy exists, the design and usability of digital platforms often pose a challenge. Financial apps and websites are frequently designed with urban, tech-savvy users in mind, and may not cater to the needs of rural or low-literate users (Karaim & Inal, 2017). Common issues include:

- Complex navigation and too many menus' options
- Lack of support for regional languages
- Poor compatibility with low-end smartphones
- Difficulties in understanding financial terminology

These factors can significantly hinder the user experience, leading to frustration and disengagement. Usability studies emphasize the importance of user-centered design, especially in financial services targeted at low-income segments (Kulkarni, 2018). Inclusive design features, such as audio support, icon-based navigation, and localized language options, are essential for broader adoption.

**d) Trust Deficits and Resistance to Change**

Trust plays a pivotal role in financial decision-making. In communities where people have traditionally relied on cash transactions or in-person banking, digital financial tools are often perceived as impersonal and risky. The absence of face-to-face interaction with NBFC representatives can lead to discomfort, skepticism, and resistance to using technology-based services (Jager et al., 2021).

In some cases, bad past experiences- such as failed transactions, delayed service response, or unclear communication, further reinforce this distrust. Additionally, cultural attitudes and peer influence can shape perceptions. For instance, if influential members of a community discourage digital use, others may follow suit regardless of infrastructure availability (Durai & Stella, 2019).

Studies have shown that trust-building mechanisms- such as transparent communication, real-time grievance redressal, local language support, and physical presence (via hybrid models), can gradually help overcome these deficits (DuBose & Mayo, 2020).

### 2.4 Regulatory and Policy Frameworks

The growth of digital financial services in India has been strongly influenced by a proactive regulatory and policy environment, which aims to promote financial inclusion, digital empowerment, and consumer protection (Holgersson et al., 2021). In the context of NBFCs, these frameworks provide both the foundation and the momentum for expanding digital adoption among underserved populations. This section reviews key government-led and NBFC-initiated financial literacy and inclusion efforts, and their impact on enabling customer adoption of digital technologies.

***Government Initiatives for Digital and Financial Inclusion***

The Indian government has undertaken multiple large-scale programs aimed at building the digital and financial capabilities of its citizens:

- **Pradhan Mantri Jan Dhan Yojana (PMJDY)** – Launched in 2014, this flagship scheme aimed at ensuring universal access to banking services has significantly increased the number of first-time account holders, many of whom are NBFC customers. It laid the groundwork for further digital financial services adoption (Karaim & Inal, 2017).
- **Digital India Initiative** – Focused on strengthening digital infrastructure, this program has accelerated internet penetration, expanded mobile connectivity, and encouraged digital payments, especially in Tier II and Tier III cities (DuBose & Mayo, 2020).
- **National Strategy for Financial Education (NSFE)** – Released by the Reserve Bank of India (RBI) and coordinated by the Financial Literacy and Inclusion Committee (FLIC), NSFE 2020–2025 provides a framework to improve financial literacy at the national level. It emphasizes targeted awareness campaigns, school and college education modules, and community outreach to increase financial competence (Baskakova & Soboleva, 2019).
- **Unified Payment Interface (UPI) and Aadhaar-based Services** – These technologies have simplified digital transactions, making it easier for NBFCs to offer paperless, fast, and secure services. The government's push for biometric authentication and e-KYC has further streamlined onboarding for digital services (Bachas et al., 2018).

These policy-level interventions have lowered entry barriers for customers and created an ecosystem conducive to digital adoption. However, the effectiveness of these policies at the last-mile level—especially among customers of NBFCs in rural areas—depends heavily on awareness, training, and local implementation.

***RBI and Regulatory Support for NBFCs***

The Reserve Bank of India (RBI), as the primary regulator of NBFCs, has encouraged the sector to adopt customer-centric technology solutions while maintaining transparency and security (Al-Emran & Griffy-Brown, 2023). Regulatory measures such as:

- Fair Practices Code
- Digital Lending Guidelines (2022)
- Customer Grievance Redressal Mechanisms
- Mandatory financial literacy material for borrowers

These have ensured that NBFCs provide not only access but also adequate protection and education for their customers in the digital domain.

The RBI has also directed NBFCs to conduct awareness campaigns and offer financial literacy materials in local languages, particularly for low-income and first-time borrowers. These guidelines support the development of trust and informed participation among customers (Aytekin et al., 2022).

***NBFC-led Financial Literacy and Inclusion Initiatives***

Several leading NBFCs have proactively implemented financial literacy and digital empowerment programs to enhance customer engagement:

- **Muthoot Finance** has launched community-based outreach programs focusing on digital onboarding and fraud awareness. Their field executives often assist customers with app-based transactions, e-KYC procedures, and repayment tracking via mobile (Grohmann et al., 2018).
- **Cholamandalam Investment and Finance Company (Chola)** has adopted a hybrid approach—integrating digital solutions with physical branch assistance. Their customer engagement includes vernacular video tutorials, digital kiosks at branches, and village-level awareness drives (Jager et al., 2021).

Other NBFCs have collaborated with NGOs, Self-Help Groups (SHGs), and Microfinance Institutions (MFIs) to reach marginalized populations with customized financial literacy tools and assisted digital services.

***Impact and Gaps***

While policy and regulatory frameworks have undoubtedly accelerated digital adoption, several implementation gaps remain:

- **One-size-fits-all models** fail to address the diversity of digital readiness across regions and demographics (Ozili, 2018).
- **Limited capacity-building** among NBFC staff hinders their ability to educate and guide customers effectively (Hermawan & Lestari, 2022).
- **Short-term campaigns** often lack continuity, failing to build sustained financial habits or digital confidence (Agyekum et al., 2022).
- **Evaluation mechanisms** to assess the impact of financial literacy initiatives are often absent or underdeveloped (Siddiqui & Siddiqui, 2020).

The literature suggests that regulatory and policy frameworks have created an enabling environment for digital adoption in the NBFC sector. However, the effectiveness of these frameworks depends on their translation into context-specific, ground-level interventions. For NBFCs operating in semi-urban and rural India, aligning regulatory compliance with genuine customer education and support remains the key to sustainable digital transformation.

## 3. RESEARCH METHODOLOGY

This study adopts a qualitative research methodology to explore how digital inclusion and financial literacy influence technology adoption among customers of Non-Banking Financial Companies (NBFCs) in Jharkhand. The qualitative approach allows for an in-depth understanding of the lived experiences, perceptions, and behavioral patterns of NBFC customers in relation to digital financial services.

### *3.1 Research Approach: Qualitative Case Study-Based Approach*

The research is grounded in a **qualitative case study** framework, which enables the investigation of complex phenomena within their real-life context. Given the exploratory nature of the topic—centered on customer perceptions, barriers, and adoption behaviors—a case study design is ideal for generating rich, detailed insights that may not be captured through quantitative techniques.

**Rationale for Using Case Studies**

Case studies offer the opportunity to analyze the phenomenon of technology adoption in a natural setting, considering social, economic, and cultural variables. They help in understanding the **"how" and "why"** behind customer behavior and technology usage, especially in geographically and demographically diverse settings like Jharkhand.

This study focuses on **two NBFCs as case units**:

- Cholamandalam Investment and Finance Company (Chola)
- Muthoot Finance Ltd.

These organizations have demonstrated significant initiatives in promoting digital financial services and financial literacy in semi-urban and rural areas, making them suitable cases for examining the research problem.

### *3.2 Case Selection*

To examine the role of digital inclusion and financial literacy in driving technology adoption, the study selects two prominent Non-Banking Financial Companies (NBFCs)- Cholamandalam Investment and Finance Company Ltd. (Chola) and Muthoot Finance Ltd. as representative case studies.

These NBFCs were purposefully selected based on their active engagement in digital transformation, widespread presence in semi-urban and rural regions, and their consistent efforts to educate and onboard customers into digital financial ecosystems. Both organizations operate extensively in Jharkhand and offer valuable contrasts and similarities in how they promote and implement digital service adoption.

**Case 1: Cholamandalam Investment and Finance Company Ltd. (Chola)**

Chola, a part of the Murugappa Group, has emerged as a leading NBFC in India, specializing in vehicle finance, home loans, and SME financing. Over the past few years, Chola has invested heavily in **digital platforms**, offering customers access to loan applications, repayment tracking, and account management through mobile apps and online portals.

Key initiatives relevant to this study include:

- Deployment of self-service digital kiosks at branch offices.
- Use of vernacular mobile apps for better accessibility in rural areas.
- Training programs for field agents to act as digital enablers for customers.
- Implementation of digital awareness campaigns in semi-urban and rural communities.

Chola's hybrid model—blending digital access with in-person support—provides an interesting framework to explore customer attitudes and adoption behavior.

**Case 2: Muthoot Finance Ltd.**

Muthoot Finance, India's largest gold loan company, has been a pioneer in extending credit access to the underserved. With a vast branch network across India, including Jharkhand, Muthoot has made significant strides in digitizing its service offerings, such as gold loan renewals, interest payments, and wallet integration for faster disbursal.

Key digital adoption measures by Muthoot include:

- Muthoot Online and mobile app services for gold loan customers.
- Use of SMS alerts, chatbots, and online grievance redressal tools.
- Regular financial literacy drives and digital training sessions for rural customers.
- Partnership with fintech firms to improve digital payment interfaces.

Muthoot's efforts to empower traditionally conservative and cash-dependent customers through digital tools make it a compelling case for examining trust-building, usability, and literacy issues in digital adoption.

These case studies offer the opportunity to compare different approaches to digital adoption across product types, technology maturity, and customer interaction models, thereby enriching the depth and scope of the qualitative analysis.

### *3.3 Data Collection Methods*

To comprehensively explore the role of digital inclusion and financial literacy in technology adoption among NBFC customers, the study employs a multi-source qualitative data collection strategy. This involves both primary data gathered from direct interactions with stakeholders and secondary data sourced from relevant institutional and academic materials.

**Primary Data Collection**

The core of the research relies on in-depth, semi-structured interviews, which allow for open-ended discussions and deeper insights into participants' experiences, perceptions, and challenges related to digital financial services.

**a) Customer Interviews:**

- **Target Group**: Existing customers of Cholamandalam Finance and Muthoot Finance in selected regions of Jharkhand, particularly from semi-urban and rural backgrounds.
- **Purpose**: To understand firsthand experiences with digital platforms, ease of access, perceived benefits and risks, and barriers such as lack of digital skills, trust issues, or technological limitations.
- **Sample Characteristics**: Diverse customer profiles in terms of age, education level, occupation, and digital literacy status.

**b) Executive Interviews:**

- **Target Group**: Customer relationship managers, field agents, digital transformation officers, and other relevant personnel from both NBFCs.
- **Purpose**: To gain insights into organizational strategies for digital onboarding, challenges in customer adaptation, employee training programs, and digital literacy initiatives.
- **Expected Outcomes**: Understanding how internal strategies are aligned with customer needs, and how feedback loops from the ground inform digital planning.

The interviews will follow a flexible guide that allows the researcher to probe deeply into relevant themes while maintaining consistency across conversations.

**Secondary Data Collection**

To contextualize and support the primary findings, the study also analysed a variety of secondary data sources:

- **RBI publications and policy documents** related to financial literacy, digital lending guidelines, and NBFC regulations.
- **Government reports** from institutions such as NITI Aayog, Ministry of Finance, and Digital India Mission related to financial inclusion and digital adoption.
- **Annual reports and sustainability disclosures** of Cholamandalam Finance and Muthoot Finance detailing their digital strategies, customer engagement efforts, and financial literacy programs.
- **Previous case studies and academic articles** on digital transformation in NBFCs and similar financial institutions operating in rural India.

Together, these sources will provide a triangulated view of the digital adoption ecosystem in NBFCs—capturing both top-down (policy and strategy) and bottom-up (customer experience) perspectives.

### *3.4 Data Analysis*

The study adopts a qualitative data analysis framework to extract meaningful insights from the interviews and secondary sources. The analysis will be conducted using thematic analysis and a comparative case study approach to systematically interpret the data gathered from the two selected NBFCs—Cholamandalam Finance and Muthoot Finance.

**a) Thematic Analysis**

Thematic analysis was employed to identify and interpret recurring patterns and insights across the primary qualitative data collected through in-depth interviews with customers and executives of Cholamandalam Finance and Muthoot Finance in Jharkhand. This method allowed the researcher to move beyond surface-level observations and understand deeper meanings, motivations, and challenges surrounding technology adoption in the NBFC sector.

The analysis followed Braun and Clarke's (2006) six-phase framework, which includes: familiarization with data, generation of initial codes, searching for themes, reviewing themes, defining and naming themes, and producing the report. The major themes that emerged are presented below.

**Theme 1: Digital Literacy as a Foundation for Adoption**

Many customers, particularly in semi-urban and rural areas, highlighted their lack of knowledge and confidence in using digital platforms. While mobile penetration is widespread, the ability to use apps, navigate interfaces, and understand digital terms remains low.

- **Customer Voice:** "I can use WhatsApp, but I am scared to use the NBFC app. What if I make a mistake and lose money?"
- **Executive Insight:** "We still spend a lot of time educating customers on how to check their loan balance online or make digital repayments."

This theme underscores the critical role of digital literacy in bridging the gap between access and actual usage.

**Theme 2: Trust and Perceived Security of Digital Transactions**

Trust emerged as a central theme in both case studies. Several respondents expressed fears of fraud, data theft, and making errors while using digital channels. There was a noticeable preference for in-person interactions, especially when dealing with financial matters.

- **Customer Voice:** "Online feels risky. In the branch, I know who to talk to."
- **Executive Insight:** "Even though we have UPI options and wallet-based repayments, many customers still insist on paying cash at the counter."

This theme highlights how digital trust deficits continue to hinder broader adoption and emphasizes the need for robust trust-building measures.

**Theme 3: Role of Field Staff in Enabling Digital Use**

Both NBFCs have empowered their field staff to act as digital facilitators, educating customers during collection visits or onboarding. These individuals serve as a bridge between technology and the customer.

- **Customer Voice:** "The field officer showed me how to check my balance on the app. I trust him more than the internet."
- **Executive Insight:** "We train our field staff to assist customers with app installations and digital queries during house visits."

This theme illustrates the importance of human touch in digital transformation, particularly in rural financial ecosystems.

**Theme 4: Infrastructure and Accessibility Gaps**

Despite availability of mobile phones, limited or unstable internet connectivity, lack of smartphones, and language barriers remain significant hurdles in digital inclusion.

- **Customer Voice:** "There is no proper internet in my village. I try using the app, but it hangs or does not open."
- **Executive Insight:** "Many of our customers use basic phones or borrow smartphones from family members to transact digitally."

This theme highlights how digital infrastructure gaps—particularly in Tier II and Tier III towns—create a digital divide even within technologically enabled NBFC systems.

**Theme 5: Financial Literacy and Informed Decision-Making**

The interviews revealed that customers with higher financial literacy were more confident and proactive in adopting digital financial services. Conversely, low financial knowledge often led to fear, confusion, or complete avoidance of digital options.

- **Customer Voice:** "Once I understood interest calculations and loan tracking, I felt better using the app."
- **Executive Insight:** "Our financial literacy camps have helped increase digital adoption in areas where we consistently engaged with customers."

This theme demonstrates how financial literacy acts as both a driver and enabler of digital adoption and long-term engagement with NBFC services.

**Theme 6: Perceived Benefits and Motivation to Adopt**

Where customers had positive digital experiences—such as faster loan processing, real-time balance checking, and fewer branch visits—they were more inclined to continue using digital services.

- **Customer Voice:** "Now I don't have to go to the city every time. I pay from my phone."
- **Executive Insight:** "We've noticed that repeat customers are more likely to stay digital once they experience the ease and speed of the system."

This theme reflects how convenience, time savings, and reduced travel costs can motivate customers to adopt and stick with digital channels, provided they overcome the initial barriers.

**b) Comparative Case Study Analysis**

To deepen the understanding of how digital inclusion and financial literacy affect technology adoption among NBFC customers, this study undertakes a comparative case analysis of two prominent non-banking financial companies operating in Jharkhand: Cholamandalam Investment and Finance Company (Cholamandalam Finance) and Muthoot Finance Ltd (Choudhary et al., 2022). Both NBFCs have undertaken significant steps toward digital transformation, yet they serve distinct customer profiles and operate under varied strategic models. This analysis evaluates their digital strategies, customer experiences, literacy initiatives, and infrastructural challenges.

**Table 1- Digital Strategy and Service Delivery Models**

| Aspect | Cholamandalam Finance | Muthoot Finance |
|---|---|---|
| **Primary Products** | Vehicle loans, home loans, SME loans | Gold loans, personal loans, insurance, money transfer |
| **Digital Platforms** | Chola App, online loan management, EMI calculators | Muthoot Online, Gold Loan @ Home, WhatsApp services |
| **Customer Interface** | Mobile app + physical branches | App + WhatsApp + door-step loan disbursal |
| **Field Integration** | Field officers assist with app usage | Doorstep staff educate customers during home visits |

Source: Compiled by authors

While both NBFCs promote hybrid service models, Muthoot Finance's "Gold Loan @ Home" initiative has made digital interactions more personalized. Cholamandalam Finance, on the other hand, focuses on branch-based support and assisted digital adoption for vehicle loan customers.

**Table 2- Digital Literacy and Financial Awareness Initiatives**

| Aspect | Cholamandalam Finance | Muthoot Finance |
|---|---|---|
| **Digital Training for Staff** | Structured modules for field staff | Digital literacy included in staff induction |
| **Customer Awareness Programs** | Digital onboarding during loan disbursal | Financial literacy camps in collaboration with NGOs |
| **Languages Supported** | English, Hindi, regional languages | English, Hindi, regional languages |

Source: Compiled by authors

Muthoot Finance has been proactive in organizing community-level financial literacy camps, especially for gold loan customers in rural Jharkhand. Cholamandalam focuses more on one-on-one education through loan officers during disbursal or collections, making it highly personalized but less scalable.

**Table 3- Barriers to Technology Adoption**

| Aspect | Cholamandalam Finance | Muthoot Finance |
|---|---|---|
| **Primary Customer Concerns** | App navigation difficulties, fear of mistakes | Cyber fraud, lack of smartphone ownership |
| **Connectivity Issues** | Frequently reported in interior villages | Managed with doorstep services in low-connectivity zones |
| **Trust in Digital Channels** | Moderate to low, higher among younger customers | Low among first-time gold loan customers |

Source: Compiled by authors

Cholamandalam customers reported technical and usability challenges, while Muthoot Finance faced greater trust and device access issues due to a large base of first-time digital users, often from low-income backgrounds.

**Table 4- Role of Field Staff in Technology Enablement**

| Aspect | Cholamandalam Finance | Muthoot Finance |
|---|---|---|
| **Staff Role** | Educate customers during disbursement or EMI collection | Facilitate digital payments and app use at home |
| **Trust Factor** | Customers rely on field staff for digital navigation | Strong rapport built through repeat doorstep visits |

Source: Compiled by authors

Both NBFCs effectively use field personnel as digital facilitators, but Muthoot's doorstep service model adds a layer of comfort and trust, especially among women and elderly customers.

**Table 5- Outcomes of Digital Inclusion Efforts**

| Aspect | Cholamandalam Finance | Muthoot Finance |
|---|---|---|
| **Customer Migration to Digital** | Gradual increase in EMI payments via app | Faster uptake of WhatsApp-based services |
| **Customer Feedback Mechanisms** | Feedback through app ratings and helpline | Regular feedback via staff visits and SMS surveys |
| **Repeat Digital Usage** | Higher among customers with prior banking experience | Linked to literacy sessions and ease of services |

Source: Compiled by authors

Muthoot's informal, WhatsApp-driven approach and emphasis on continuous education led to higher customer retention in digital channels, whereas Cholamandalam saw steady progress with tech-savvy segments.

**Table 6- Summary of Comparative Insights**

| Dimension | Cholamandalam Finance | Muthoot Finance |
|---|---|---|
| **Digital Focus** | App-centric hybrid model | Doorstep + app + WhatsApp integration |
| **Literacy Approach** | Individual education during interaction | Community-level awareness campaigns |
| **Trust-building** | Staff guidance and secure app design | Doorstep delivery and physical presence |
| **Key Adoption Challenge** | Usability and confidence issues | Trust and device access issues |
| **Success Drivers** | Tech-savvy youth, vehicle finance users | Frequent repeat interactions, simplicity of gold loans |

Source: Compiled by authors

Both NBFCs demonstrate innovative approaches to bridging the digital divide, yet face distinct challenges shaped by their customer base and operational models. While Cholamandalam Finance's strategy leans towards gradual onboarding via structured apps, Muthoot Finance prioritizes trust and accessibility through in-person digital facilitation. The comparative analysis highlights that no one-size-fits-all solution exists; rather, technology adoption is most effective when tailored to customer literacy levels, trust dynamics, and regional infrastructural realities.

**Triangulation for Validity**

In qualitative research, ensuring credibility, reliability, and depth of understanding is essential. To enhance the validity of the findings in this study, methodological triangulation was employed. Triangulation involves using multiple data sources, perspectives, and methods to cross-verify insights, thereby increasing the robustness of the research conclusions.

This study specifically applied **two forms of triangulation**:

**1. Data Source Triangulation**

This form of triangulation involved gathering information from multiple participant categories and document sources to capture a well-rounded understanding of the research phenomenon.

- **Customer Interviews**: In-depth, semi-structured interviews were conducted with NBFC customers across different demographic backgrounds (urban, semi-urban, and rural), age groups, and service types (e.g., vehicle loans, gold loans).
- **Executive Insights**: Interviews with regional branch managers, digital transformation officers, and field executives from Cholamandalam Finance and Muthoot Finance provided institutional perspectives on strategy, challenges, and customer behavior.
- **Secondary Data**: Existing case studies, RBI reports, government digital inclusion schemes, and NBFC annual reports were reviewed to validate and contextualize findings from primary sources.

**Benefit:** This triangulation allowed for a comparison between customer experiences, organizational practices, and industry-wide policies, ensuring that findings were not biased by a single data source.

**2. Methodological Triangulation**

This type of triangulation involved using multiple qualitative methods to explore the same research questions from different angles.

- **In-depth Interviews**: Used to gather detailed narratives, perceptions, and personal experiences from customers and executives.
- **Document Analysis**: Review of policy documents, training manuals, and financial literacy materials to understand the institutional approach to digital inclusion.
- **Case Comparison**: The use of two NBFCs (Cholamandalam and Muthoot) facilitated a comparative case study approach, helping identify common patterns and divergent practices.

**Benefit:** This approach helped to cross-validate the emerging themes—such as trust, usability, and literacy—across multiple methods, ensuring that findings were grounded in diverse evidence.

Triangulation served as a critical methodological strategy to validate and enrich the qualitative findings of this study. By integrating multiple perspectives and data collection methods, the research was able to capture the complex interplay of digital inclusion, financial literacy, and technology adoption in the NBFC sector. It also strengthened the trustworthiness and transferability of the findings, making them valuable for academic inquiry as well as practical application by NBFCs and policymakers.

## 4. FINDINGS AND DISCUSSION

This chapter presents the key findings derived from thematic and comparative case study analysis, focusing on the central themes that emerged from interviews and document reviews. The findings reflect the experiences and perspectives of customers and NBFC executives from Cholamandalam Finance and Muthoot Finance. The discussion connects these insights to the broader literature and theoretical framework, highlighting the influence of digital inclusion and financial literacy on technology adoption.

### *4.1 Impact of Digital Inclusion on Technology Adoption*

One of the most prominent findings from the study is the strong positive correlation between digital inclusion and the rate of technology adoption among NBFC customers. Digital inclusion—defined by access to digital devices, internet connectivity, and user capability—plays a foundational role in determining whether and how customers engage with digital financial services.

**A. Accessibility as a Driver of Adoption**

Customers with ready access to smartphones, mobile internet, and digital banking tools were found to be significantly more inclined to adopt and continue using NBFC digital platforms. In both case studies:

- **Cholamandalam Finance** customers in urban areas used the Chola App for EMI payments and loan tracking due to reliable 4G connectivity and basic digital literacy.
- **Muthoot Finance** customers, particularly in tier-2 cities, increasingly relied on WhatsApp-based loan renewal and account updates when they had stable mobile access.

These patterns suggest that digital accessibility is a necessary precondition for service usage but not a sufficient one in isolation—support systems and usability also matter.

**B. Persistent Infrastructure Gaps**

However, in semi-urban and rural regions of Jharkhand, customers frequently cited poor internet connectivity, lack of smartphones, and unreliable power supply as major deterrents to digital adoption. These infrastructural limitations were more acute among:

- Daily wage earners and small business owners relying on basic phones.
- Elderly customers unfamiliar with touchscreen navigation or unable to maintain digital records.

These issues contributed to a continued reliance on in-person interactions and branch-based services.

**C. Role of Assisted Digital Models**

Both NBFCs attempted to bridge these gaps through assisted digital service delivery:

- Cholamandalam’s field officers helped customers download and navigate the app during EMI collections.
- Muthoot Finance’s doorstep service combined physical service delivery with on-the-spot digital training for loan renewals and payments.

This hybrid approach—blending digital tools with human assistance—proved effective in expanding reach, especially among digitally marginalized groups.

**D. Urban-Rural Divide**

There is a clear urban-rural divide in digital inclusion. Urban customers, due to better education, exposure, and device ownership, were more confident in self-managing digital transactions. In contrast, rural customers expressed skepticism about online transactions, largely due to fears of fraud and technical errors.

This reinforces existing literature (e.g., World Bank, 2022) that emphasizes the need for context-sensitive digital strategies to support equitable financial inclusion.

The findings underscore that digital inclusion is not merely about internet access, but about a comprehensive ecosystem involving:

- Affordable devices
- Reliable connectivity
- Contextual customer support
- Trust-building measures

The evidence suggests that NBFCs must adopt tailored strategies for different customer segments. For regions with infrastructural challenges, low-bandwidth apps, offline support models, and digital literacy workshops can significantly improve adoption.

Moreover, government and NBFC-led infrastructure development (e.g., through BharatNet or mobile banking vans) can play a pivotal role in expanding the digital footprint in underbanked areas.

### *4.2 Role of Financial Literacy in Digital Finance Adoption*

The study reveals that financial literacy significantly influences the attitudes and behaviors of customers toward digital financial services. While digital inclusion provides the means to access services, it is financial literacy that often determines how confidently and effectively customers utilize those services.

#### A. Financial Literacy Builds Trust and Confidence

Customers with a better understanding of digital finance concepts—such as interest calculation, data privacy, OTP authentication, and online payment procedures—demonstrated a higher level of trust in using mobile apps and online portals offered by NBFCs.

- In both Cholamandalam Finance and Muthoot Finance, customers who had attended digital finance awareness sessions (either through CSR initiatives or NGO collaborations) were more likely to:
    - Regularly check account status via the app.
    - Complete EMI payments through digital channels.
    - Recommend digital tools to peers.

This aligns with previous studies highlighting the role of financial education in reducing perceived risk and enhancing digital engagement.

#### B. Misinformation and Fear Undermine Usage

A significant proportion of rural and semi-urban customers interviewed exhibited low levels of financial literacy, especially regarding:

- How to verify a legitimate digital platform.
- Steps to prevent digital fraud (e.g., not sharing OTPs or passwords).
- Understanding transaction charges and limits.

These gaps led to increased fear of financial fraud, with many customers expressing reluctance to use NBFC apps or UPI payments due to:

- Previous negative experiences (e.g., failed transactions, scams).
- Misinformation spread through peer groups or social media.
- Absence of on-demand support to resolve issues quickly.

One Muthoot customer from rural Ranchi said: *"I don't use online payments because I once lost ₹500. No one helped me recover it, so I prefer paying at the branch."*

#### C. Literacy Alone is Not Enough—Ongoing Support is Key

While financial literacy was found to be a crucial enabler, the study also observed that one-time training or basic knowledge is not sufficient. Customers need continuous support and real-time handholding, particularly during their first few digital transactions.

Cholamandalam Finance's use of video-based explainers and regional language chat support emerged as an effective model to reinforce financial awareness and build digital confidence over time.

#### D. Impact of Gender and Age

The study noted that women and elderly customers often face compounded challenges:

- Women reported feeling less confident with digital platforms, especially when they had limited exposure to mobile banking tools.
- Elderly customers, even when literate, expressed discomfort with navigating complex user interfaces or understanding app notifications.

This highlights the need for demographic-sensitive financial literacy campaigns that cater to specific user needs, using simple language, local dialects, and user-friendly illustrations.

The findings establish that financial literacy is a strong predictor of digital finance adoption among NBFC customers. Unlike digital infrastructure, which is a structural concern, financial awareness can be rapidly improved through targeted interventions:

- **Onboarding workshops** at the time of loan disbursement.
- **Video tutorials** embedded in apps.
- **Community-based financial education sessions** in collaboration with local self-help groups or NGOs.

For policymakers and NBFC leaders, this implies that investing in financial education is not just a social responsibility—it's a strategic imperative for improving digital engagement, reducing fraud-related anxieties, and enhancing customer satisfaction.

## 5. CONCLUSION

This study explored the effectiveness of technology adoption among NBFC customers in Jharkhand through a qualitative case study of Cholamandalam Finance and Muthoot Finance. By focusing on the roles of digital inclusion and financial literacy, it identified the enablers, barriers, and best practices in fostering digital engagement in the NBFC sector.

### *5.1 Key Insights from the Study*

- **Digital Inclusion and Financial Literacy are Critical Enablers:** Access to mobile devices, internet connectivity, and user-friendly platforms significantly affects customers' willingness and ability to adopt digital financial services. However, digital access alone is not enough—financial literacy plays a central role in enabling confident and informed usage.
- **Trust and Awareness Remain Major Barriers:** Despite widespread digital offerings, many customers remain hesitant due to concerns over fraud, data privacy, and a lack of understanding of digital tools.

Building trust and providing handholding support are essential for overcoming resistance.

- **Customer-Centric Design Enhances Accessibility:** Simplified app interfaces, multilingual support, and visual cues enhance usability, especially for first-time users and those with low digital literacy.
- **Best Practices from NBFCs Show Positive Impact:** Initiatives such as integrated financial education programs, AI-based fraud detection, and hybrid support models (combining digital and physical touchpoints) have helped NBFCs strengthen customer engagement and drive adoption in semi-urban and rural areas.

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