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Artificial Intelligence and Financial Inclusion: A Contemporary Study of AI-Enabled Digital Payments in Hubli City

Dr. Asma Anjum Nadaf

Faculty, Department of Economics, Anjuman Arts, Science, Commerce College and P.G. Studies, Dharwad – **580001**, Karnataka, India, E-mail: asmaanjum.ndf@gmail.com

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ABSTRACT

Artificial Intelligence (AI) has emerged as a transformative force in the financial sector, particularly in enhancing the scope and efficiency of financial inclusion. In the Indian context, the rapid expansion of digital payment systems has significantly increased access to financial services. However, the extent to which AI contributes to meaningful financial inclusion at the grassroots level remains an area of inquiry. This study examines the role of AI-enabled financial services in promoting financial inclusion in Hubli city, Karnataka. The research is based on primary data collected from 100 respondents representing diverse socio-economic backgrounds during 2025–2026. The study analyses patterns of digital payment usage, awareness of AI technologies, and user perceptions regarding trust and security. The findings indicate that while digital financial services are widely used, awareness about AI remains limited, creating a gap between usage and understanding. Issues such as data privacy concerns, digital illiteracy, and lack of transparency in AI systems hinder inclusive participation. The paper concludes that although AI has significant potential to deepen financial inclusion, its benefits can only be realized through increased awareness, improved digital literacy, and supportive policy frameworks.

Introduction

The contemporary economic landscape is increasingly shaped by the integration of Artificial Intelligence into various sectors, with the financial system being one of the most significantly impacted. AI technologies, including machine learning algorithms, predictive analytics, and automated customer service systems, are redefining the way financial services are delivered and accessed. In India, the growth of digital payment platforms such as Unified Payments Interface (UPI), mobile wallets, and internet banking has accelerated financial inclusion by making financial transactions faster, cheaper, and more accessible.

Financial inclusion, broadly understood as the availability and accessibility of financial services to all sections of society, has long been a priority in India's development agenda. The adoption of AI in financial services has the potential to further this objective by reducing operational costs, improving risk assessment, and enhancing user experience. For instance, AI-driven systems can detect fraudulent transactions in real time, provide personalized financial advice, and extend credit facilities to individuals with limited financial history.

Despite these advancements, the present scenario reveals a critical disconnect. While a large segment of the population actively uses digital financial services, there is limited awareness about the underlying AI technologies that enable these services. This gap raises important concerns regarding trust, informed usage, and the sustainability of financial inclusion efforts. In semi-urban regions such as Hubli, where digital adoption is growing rapidly, understanding these dynamics becomes particularly relevant. This study seeks to explore whether AI is truly facilitating inclusive financial development or merely expanding digital usage without corresponding awareness and empowerment.

Review of Literature

The growing intersection between Artificial Intelligence (AI) and financial inclusion has attracted significant attention in recent academic and policy discourse. Financial inclusion, which refers to the availability and accessibility of financial services to all individuals, has been a major developmental objective, particularly in emerging economies like India. The integration of AI into financial systems has introduced new possibilities for enhancing inclusion by improving efficiency, reducing costs, and expanding outreach.

Recent studies have emphasized that AI plays a transformative role in financial services by enabling automation, predictive analytics, and personalized customer experiences. According to the World Bank (2022), digital financial services supported by AI have significantly reduced transaction costs and improved access to banking services, particularly for underserved populations. Similarly, research by NITI Aayog (2021) highlights that AI-driven technologies such as alternative credit scoring and digital identity verification have enabled financial institutions to extend services to individuals lacking formal financial histories.

In the Indian context, the rapid expansion of digital payment systems, particularly the Unified Payments Interface (UPI), has been instrumental in promoting financial inclusion. The Reserve Bank of India (2023) reports that the adoption of digital payments has grown exponentially, supported by technological innovations and policy initiatives such as Digital India. AI plays a crucial role in this ecosystem by facilitating real-time fraud detection, enhancing transaction security, and improving user experience through chatbots and automated assistance.

Despite these advancements, several scholars have pointed out the challenges associated with the adoption of AI in financial services. One of the major concerns is the issue of algorithmic bias, where AI systems may unintentionally discriminate against certain groups due to biased training data (O'Neil, 2016). Additionally, data privacy and cybersecurity risks have emerged as critical issues, as increased reliance on digital platforms exposes users to potential data breaches and fraud (Kumar & Singh, 2022).

Another important dimension discussed in the literature is the digital divide. While AI-enabled financial services have the potential to enhance inclusion, their benefits are not evenly distributed across different socio-economic groups. According to Demirgüç-Kunt et al. (2022), individuals with limited digital literacy or access to technology are less likely to benefit from digital financial innovations, thereby exacerbating existing inequalities. This is particularly relevant in semi-urban and rural areas, where infrastructural and educational constraints persist.

Furthermore, recent studies (2023–2025) have introduced the concept of "passive financial inclusion," where individuals use digital financial services without fully understanding the underlying technologies. This raises concerns about trust, informed decision-making, and long-term sustainability of inclusion efforts. Users may rely on AI-driven systems without being aware of how their data is used or how decisions are made, leading to potential risks and vulnerabilities.

While the existing literature provides valuable insights into the macro-level impact of AI on financial inclusion, there is a noticeable gap in localized, empirical studies that capture user perceptions and experiences at the grassroots level. Most studies rely on secondary data and fail to explore the behavioural and perceptual aspects of AI adoption. This study seeks to address this gap by providing primary data-based evidence from Hubli city, thereby contributing to a more comprehensive understanding of the role of AI in financial inclusion in a semi-urban context.

Objectives of the Study

1. To assess the level of awareness of AI in financial services
2. To examine the usage of AI-enabled digital payment systems
3. To analyze trust and perception towards AI in finance
4. To identify barriers to inclusive adoption of AI-based financial services

Research Methodology

The research methodology provides a systematic approach for data collection and analysis. The study adopts an empirical and descriptive design based on primary data to examine the role of Artificial Intelligence in financial inclusion in Hubli city.

Nature of the Study

The present study is empirical and descriptive in nature, aiming to examine the role of Artificial Intelligence in promoting financial inclusion through digital payment systems. The empirical approach is based on primary data, which helps in capturing real-time experiences and perceptions of individuals. The descriptive design is adopted to systematically analyze the level of awareness, usage patterns, and attitudes of respondents towards AI-enabled financial services in a semi-urban context.

Data Collection

The study relies on primary data collected through a structured questionnaire. The questionnaire was carefully designed to include both close-ended and opinion-based questions in order to gather comprehensive information regarding digital payment usage, awareness of AI, and challenges faced by users. In addition to the formal survey, informal interactions were also conducted with respondents to

gain deeper insights into their perceptions and practical experiences. The data collection was carried out in Hubli city during the period 2025–2026, ensuring that the findings reflect the current scenario of digital financial inclusion.

Sample Design

The sample for the study consists of 100 respondents selected through a convenience sampling technique. This method was chosen due to ease of accessibility and time constraints, allowing the researcher to collect data efficiently from available participants. The respondents include students, small traders, and salaried individuals, representing different socio-economic backgrounds. This diversity in the sample helps in understanding variations in awareness and adoption of AI-enabled financial services across different groups within the urban setting of Hubli.

Tools of Analysis

The collected data has been analyzed using simple and appropriate statistical tools. Percentage analysis has been employed to present the responses in a clear and systematic manner, facilitating easy interpretation of data. Comparative interpretation has been used to examine differences in awareness, usage, and perceptions among various categories of respondents. Additionally, graphical representations may be used wherever necessary to provide a visual understanding of the findings and enhance clarity in presentation.

Data Analysis and Interpretation

The analysis and interpretation of data constitute an essential part of the research process, as they help in deriving meaningful insights from the collected information. The present study is based on primary data collected from 100 respondents in Hubli city, representing different socio-economic backgrounds such as students, salaried individuals, and small traders. The data has been systematically analyzed using percentage analysis and simple tabulation methods to understand patterns of digital payment usage, awareness of Artificial Intelligence, and the challenges associated with AI-enabled financial services.

The following tables present a detailed analysis of respondents' behaviour, perceptions, and experiences related to digital financial systems. The analysis is structured in a logical sequence,

beginning with general usage patterns, followed by awareness and perception of AI, and concluding with the challenges and risks faced by users.

Table 1: Digital Payment Usage

Usage pattern	Number of Respondents	Percentage (%)
Regularly	72	72%
Occasionally	20	20%
Rarely	08	08%
Never	00	00%
Total	100	100%

Source: Field Survey

The above table indicates that a majority of respondents use digital payment systems regularly, reflecting a high level of digital penetration in Hubli city. Only a small proportion of respondents reported rare or no usage, suggesting that digital financial services have become an integral part of daily transactions.

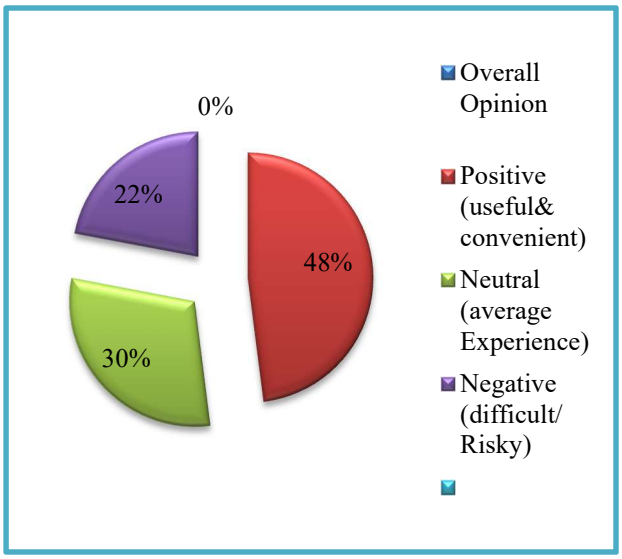
Table 2: Age-wise Distribution of Respondents

Age Group	Number of Respondents	Percentage (%)
Below 20	20	20%
20-30	40	40%
30-40	25	25%
Above 40	15	15%
Total	**100**	**100%**

Source: Field Survey

The above table shows that the majority of respondents belong to the age group of 20–30 years, indicating a higher participation of youth in the study. This is significant as younger individuals are generally more active users of digital payment systems and more exposed to technological advancements.

Diagram 1: Type of Digital Payment Applications Used



The diagram 1 highlights the preference of respondents for different digital payment applications. It is observed that Google Pay and PhonePe are the most widely used platforms among the respondents, indicating the popularity of UPI-based payment systems in the study area. Paytm and other applications are used by a comparatively smaller proportion of respondents. This pattern reflects the growing dominance of user-friendly and widely accepted platforms that offer convenience, speed, and reliability in financial transactions.

Table 3: Purpose of Using Digital Payments

Purpose	Number of Respondents	Percentage (%)
Shopping/ Payments	40	40%
Bill payments	25	25%
Money Transfer	20	20%
Others	15	15%
Total	**100**	**100%**

Source: Field Survey

The table presents the various purposes for which respondents use digital payment systems. It is evident that a majority of respondents use digital payments for shopping and routine transactions, followed by bill payments and money transfers. This indicates that digital payment systems have become an integral part of everyday economic activities. The relatively lower percentage under 'others' suggests that the primary usage remains concentrated in essential financial transactions rather than specialized services.

Table 4: Awareness of AI in Financial Services

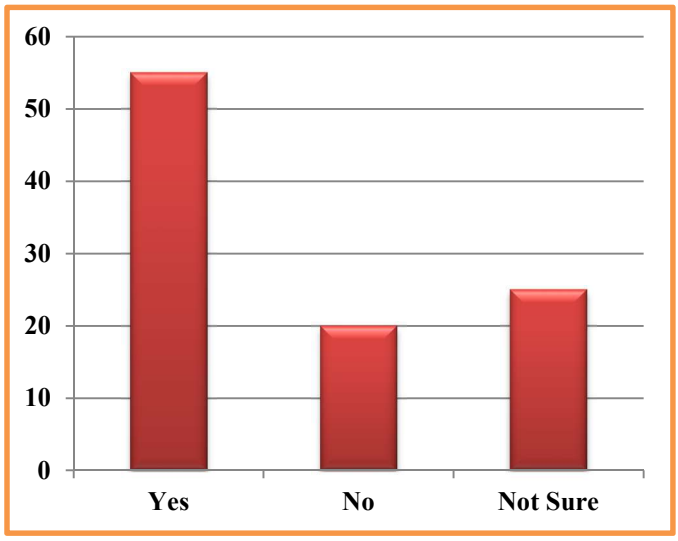
Awareness Level	Number of Respondents	Percentage (%)

Aware	38	38%
Not aware	62	62%
Total	**100**	**100%**

Source: Field Survey

The table reveals that a majority of respondents are not aware of the role of Artificial Intelligence in financial services. This highlights a significant gap between the usage of digital payment systems and the understanding of the technology behind them.

Diagram 2: Perception of AI Improving Financial Services



The opinion of respondents regarding the role of Artificial Intelligence in improving financial services. A majority of respondents believe that AI enhances the efficiency and convenience of financial transactions. However, a notable proportion either disagrees or remains uncertain, which indicates a lack of clarity or awareness about the actual functioning and benefits of AI. This reflects the need for increased awareness and understanding of AI technologies among users.

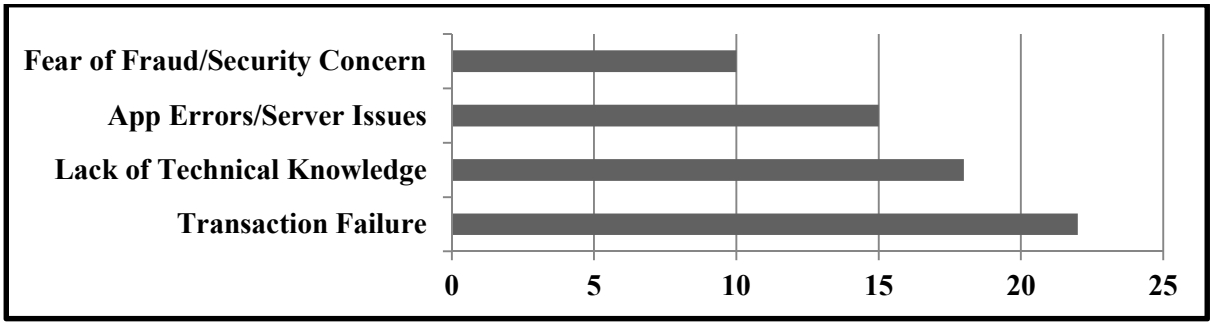
Table 5: Trust in AI-Based Financial Systems

Level of Trust	Number of Respondents	Percentage (%)
High Trust	45	45%
Neutral	30	30%
Concerned	25	255
Total	**100**	**100%**

Source: Field Survey

The data shows that while a considerable proportion of respondents trust AI-based financial systems, a notable percentage remains either neutral or concerned. This indicates the presence of a trust gap that may affect the adoption of advanced financial technologies.

Diagram 3: Problems Faced in Digital Payment Transactions



Source: Field Survey

The table shows that network or internet issues are the most common problem faced by respondents, followed by transaction failures. Lack of technical knowledge and app-related errors also affect a significant number of users, indicating both skill and system-related challenges. Additionally, some respondents expressed concerns about fraud and security. Only a small percentage reported no major problems, suggesting that most users face difficulties while using digital payment systems.

Table 6 : Major Concerns in Using AI-Based Financial Services

Types of Concern	Number of Respondents	Percentage (%)
Data Privacy & Fraud	40	40%
Lack of Knowledge	28	28%
Technical Complexity	18	18%
Poor Internet Access	14	14%
Total	**100**	**100%**

Source: Field Survey

The table reveals the key concerns faced by respondents while using AI-enabled financial services. Data privacy and fraud emerge as the most significant concerns, indicating apprehension regarding the safety of digital transactions. Lack of knowledge and technical complexity also pose barriers, suggesting that users may find it difficult to fully understand and utilize advanced financial technologies. Poor internet access, though less prominent, still affects a section of users. These concerns highlight the challenges that must be addressed to ensure inclusive and secure financial systems.

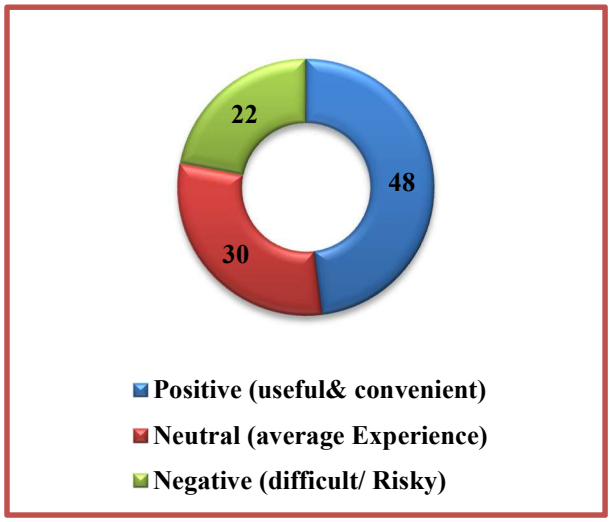
Table 7: Experience of Fraud in Digital Payment Systems

Experience of Fraud	Number of Respondents	Percentage (%)
Yes	12	12%
No	88	88%
Total	**100**	**100%**

Source: Field Survey

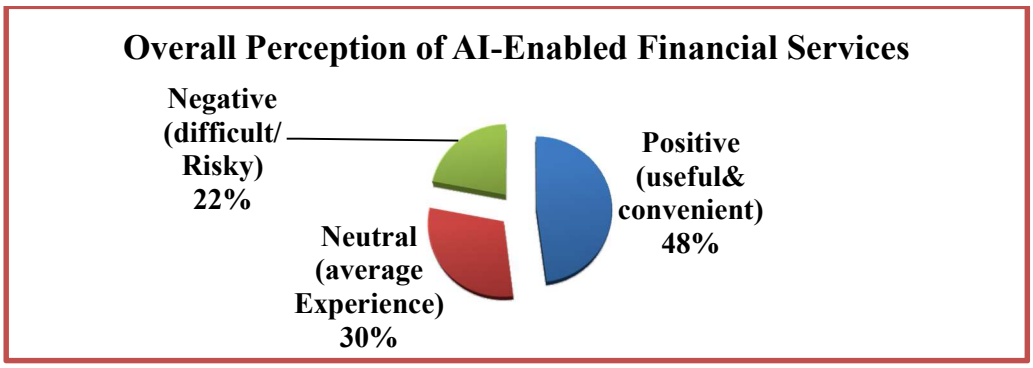
The above table shows the extent to which respondents have experienced fraud while using digital payment systems. It is evident that a large majority of respondents (88%) have not faced any form of fraud, indicating that digital payment platforms are generally perceived as safe and reliable by most users. However, 12% of respondents reported experiencing fraud, which, although relatively small, is still significant in the context of financial security.

Diagram 4: Type of Fraud Experienced



The Diagram provides insights into the different types of fraud encountered by respondents. It is observed that phishing and fake calls or links are the most common forms of fraud, followed by unauthorized deductions. Although the overall percentage of respondents experiencing fraud is relatively low, these incidents indicate vulnerabilities in digital financial systems. The presence of such risks can negatively impact user confidence and hinder the wider adoption of AI-based financial services.

Diagram 5: Overall Perception of AI-Enabled Financial Services



Source: Field Survey

The above table provides an overall assessment of respondents' perception towards AI-enabled financial services. It can be observed that nearly half of the respondents hold a positive opinion, considering these services to be convenient and useful in their daily financial transactions. However, a considerable proportion of respondents expressed neutral or negative views, indicating that challenges such as lack of awareness, security concerns, and technical difficulties continue to influence user perception. This overall evaluation highlights that while AI-driven financial services are gaining acceptance, there is still a need to address underlying issues to ensure wider and more confident adoption.

Findings:

The study reveals that digital payment systems have achieved significant penetration among respondents in Hubli, with a majority using them regularly for day-to-day transactions. This indicates a growing shift towards a cashless economy and improved access to financial services. The popularity of UPI-based applications such as Google Pay and PhonePe further reflects the increasing reliance on convenient and user-friendly digital platforms.

However, despite high usage levels, awareness regarding the role of Artificial Intelligence in financial services remains relatively low. A large proportion of respondents are unaware of how AI functions within digital payment systems, highlighting a clear gap between usage and technological understanding. This suggests that financial inclusion is being achieved at a functional level rather than at an informed or conceptual level.

The findings also indicate that while a section of respondents holds a positive perception of AI-enabled financial services, a considerable number remain uncertain or neutral. This lack of clarity reflects limited exposure to the benefits and functioning of AI technologies. Trust in AI-based systems is

moderate, as users appreciate the convenience but remain cautious due to concerns related to data privacy and fraud.

Further, the study identifies several operational challenges faced by users. Network issues and transaction failures are the most frequently reported problems, pointing towards infrastructural limitations. In addition, lack of technical knowledge among users acts as a barrier to effective utilization of digital financial services. App-related errors and system inefficiencies also contribute to user dissatisfaction.

Although only a small percentage of respondents have experienced fraud, the fear of fraud and security concerns is relatively high. This indicates that perceived risk is greater than actual experience, which may negatively influence user confidence. Overall, the findings suggest that while digital financial inclusion is expanding in Hubli, it is accompanied by challenges related to awareness, infrastructure, trust, and security.

Suggestions

To enhance the role of Artificial Intelligence in promoting financial inclusion, it is essential to focus on improving digital literacy among users. Educational initiatives and awareness programs should be conducted at the community level to inform people about AI-enabled financial services, their benefits, and safe usage practices. Special attention should be given to semi-urban and less digitally literate populations.

Strengthening cybersecurity measures is crucial to build trust among users. Financial institutions should adopt advanced AI-based fraud detection systems and ensure robust data protection mechanisms. At the same time, users should be educated about common fraud techniques such as phishing and fake links to reduce vulnerability.

Improving digital infrastructure is another key requirement. Efforts should be made to enhance internet connectivity and minimize technical issues such as transaction failures and server errors. Reliable and efficient systems will increase user confidence and encourage more frequent usage of digital payment platforms.

Financial service providers should also focus on designing user-friendly interfaces that are simple and accessible to individuals with limited technical knowledge. Simplifying the process of digital transactions can help in increasing adoption among diverse user groups.

Additionally, transparency in AI systems is important to build user trust. Providing clear information about how AI is used in financial services, particularly in areas such as fraud detection and data usage, can help reduce uncertainty and improve acceptance.

Finally, policymakers should develop inclusive fintech strategies that ensure equal access to digital financial services across different socio-economic groups. This includes promoting affordable access to smartphones and internet services, as well as encouraging innovation in AI-driven financial solutions tailored to local needs

Conclusion

The present study concludes that Artificial Intelligence is playing an increasingly significant role in promoting financial inclusion and transforming financial behaviour in Hubli city. The widespread adoption of digital payment systems reflects a growing shift towards a technology-driven financial ecosystem, where transactions have become faster, more convenient, and accessible to a larger section of the population.

However, the study also highlights a critical gap between usage and understanding. While most respondents actively use digital payment platforms, their awareness of the role of Artificial Intelligence in these services remains limited. This indicates that financial inclusion is largely functional rather than informed, which may affect the long-term sustainability of AI-driven financial systems.

The findings further reveal that trust in AI-enabled financial services is moderate, as users appreciate the convenience but remain cautious due to concerns related to data privacy, fraud, and technical issues. Problems such as network failures, transaction errors, and lack of technical knowledge continue to hinder smooth usage. Although only a small proportion of respondents have experienced fraud, the fear of fraud is relatively high, which influences user confidence and adoption behaviour.

Therefore, it can be concluded that the success of Artificial Intelligence in achieving meaningful financial inclusion depends not only on expanding access to digital platforms but also on improving awareness, strengthening security measures, and enhancing digital infrastructure. Efforts must be made to

ensure that users are not just participants but informed and confident users of AI-enabled financial services.

In conclusion, with appropriate policy support, improved digital literacy, and robust regulatory frameworks, Artificial Intelligence has the potential to bridge financial gaps and contribute to inclusive and sustainable economic development.

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