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Impact of Digital Payments on Financial Inclusion

Dr. Jatin Jakhar*, Assistant Professor,
Department of Management Studies, Vaish College of Engineering, Rohtak, Haryana, India Email: jakharjatin25@gmail.com

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Abstract: With the advent of digital payment methods, more people than ever before have access to banking services. The purpose of this research is to identify ways in which digital payments might help low-income people get access to banking services. By cutting prices, simplifying transactions, and increasing accessibility, digital payments have empowered people in low-income and rural communities. To determine the relative merits of various digital platforms in closing the income gap, the research looks at methods such contactless payment technology, UPI-based systems, and mobile wallets. It goes into greater depth on the problems with digital literacy, cybersecurity, and infrastructure that prevent digital banking from achieving its maximum potential for equitable growth. By reviewing the literature on the topic and analysing relevant case studies, this paper demonstrates how digital payments are crucial for empowering individuals with their money and facilitating long-term economic growth. Legislators, banks, and tech companies can all learn a lot from the results if they want to use digital tools to build more fair financial systems.

Keyword: Digital payment, digital payment systems, cybersecurity, digital innovation, and empirical data are all very hard to understand.

1. Introduction

Recent digital innovations have altered the banking industry, making it easier for people to use and helping the economy grow in a more inclusive way. Digital payment systems are a good approach to help people who don't have a lot of money get into the formal financial system. The difficulty in gaining access to conventional financial services is a particular problem in developing and rising countries. The ability to access affordable, practical financial products and services is what we mean when we talk about financial inclusion. This helps the economy expand and lowers poverty. But in the past, many people couldn't use formal financial institutions because they lived far away, didn't have a legal ID, or had to pay large transaction costs. New financial services, mobile technology, and internet access are making it easy, inexpensive, and available to everyone to pay with digital money.

Mobile wallets, UPI systems, QR-code transactions, and other ways to pay without touching anything have made banking services much better. These innovations make it easier and safer to do business, save money, receive credit, and take part in the digital economy. Because of the COVID-19 pandemic, it's even more vital for businesses to accept digital payments. This highlights how vital they are for keeping financial services running and promoting contactless economic activity during disasters. There are still a lot of problems, even though things are getting better. Digital literacy, cyber-security issues, a lack of infrastructure, and legislative hurdles are still making it challenging for consumers to use and benefit from digital payment systems.

What makes digital payments more or less popular and helpful is discussed in this article, along with how they facilitate the acquisition of financial services. To help legislators, banks, and internet companies create more welcoming financial ecosystems, this research reviews the literature, looks at trends, and evaluates real-world case studies. The discussion surrounding digital payments and financial inclusion is greatly improved by this study because

- **Comprehensive Understanding of Digital Payment Impact:** Mobile wallets, UPI, QR-code payments, and contactless cards are just a few of the digital payment technologies that this study thoroughly analyses and how they have revolutionized the way financial services are accessible. This study analyses various platforms across multiple locales and user demographics to better our understanding of digital payments and their potential to advance financial inclusion.
- **Bridging the Gap Between Theory and Practice:** A lot of research that is already out there talks about the nice things about digital payments. This study, however, uses case studies and real-world data to show how it might be used in real life. It presents a balanced picture of digital payment services by displaying both the good and bad sides. This can help with solutions in the actual world.
- **Identification of Barriers and Enablers:** Digital literacy, faith in technology, cost, legal frameworks, and infrastructure readiness are some of the important aspects that the research identified as driving the adoption of digital payments. By gaining a better understanding of these elements, stakeholders and policymakers would be better able to devise tailored initiatives to remove adoption barriers and speed up inclusive growth.
- **Policy and Strategic Recommendations:** This study synthesises ideas from worldwide experiences and local contexts to provide development organizations, entrepreneurs in the fintech industry, governments, and financial institutions practical solutions. Better interoperability among digital payment systems is the goal of these proposals.
- **Contribution to Sustainable Development Goals (SDGs):** Findings from the study show that digital payments can contribute to SDG achievement. Objectives 8 (Decent Work and Economic Growth) and 9 (Industry, Innovation, and Infrastructure) by facilitating the access to financial services for a larger number of people. It shows how digital payments can help people escape poverty, make men and women equal, and give individuals more control over their money.
- **Foundation for Future Research:** This study establishes a basis for subsequent enquiries by pinpointing deficiencies in current knowledge and proposing avenues for further exploration, particularly regarding the enduring impacts of digital payments on financial behaviour, resilience, and economic well-being.

2. Literature Review

Ozili (2018) examines the impact of digital banking on financial stability and inclusivity. The article shows that mobile banking and fintech services make it easier for people who don't have direct access to financial institutions to get to them. But it also warns that too much digitalisation without the right standards could make the economy less stable [1].

Bachas et al. (2018) look into how digital financial services could lower the costs of transactions. They use real-world data to show that low-cost digital tools make transactions more common and safer, which greatly increases financial inclusion, especially in distant places [2].

Patwardhan (2018) gives a full picture of how digital technology can help people get financial services.This chapter talks about payment gateways, mobile banking, and blockchain. It stresses that following the rules and protecting customers are very important for their success [3].

In order to increase access to financial services in sub-Saharan Africa, Bongomin et al. (2018) analyse how social media and mobile money operate together. Researchers found that while social networks increase people's trust in and use of a product, low levels of digital literacy acted as a barrier [4].

In their 2018 study, Salampasis and Mention investigate how fintech can broaden people's access to financial services. The chapter promotes inclusive design and ethical considerations while highlighting mobile technology, blockchain, and artificial intelligence as game-changing elements in reducing marginalisation [5].

In their 2019 study, Durai and Stella analyse how digital finance technologies impact inclusion. Case studies show that rural areas have better access, but they also point out that infrastructure, awareness, and cyber dangers are still big problems [6].

The article by Cabeza-García et al. (2019) mostly discusses the gender gap in terms of financial access. The study concludes that, in conjunction with efforts to educate and empower women, expanding women's access to financial services makes a substantial contribution to inclusive economic growth [7].

The effect of financial inclusion on women's economic empowerment is addressed by Hendriks (2019). It finds that mobile banking is critical for women's ability to save money, borrow money, and have a say in household decisions based on data collected from the field [8].

The possibility of fintech to improve financial inclusion in Africa is investigated by Makina (2019). There is a need for enabling legislation and digital infrastructure, however the study reveals that digital banking and mobile money platforms lower entrance barriers [9].

Gabor & Brooks (2020) critique the fintech-led financial inclusion agenda, suggesting it is shaped more by market-driven international development goals than grassroots needs. The authors call for regulatory safeguards and user-centered designs [10].

Barajas et al. (2020) provide a comprehensive overview of financial inclusion research. They identify progress in account access but emphasize gaps in usage, digital literacy, and the need for interoperable systems [11].

Trends in financial service access and usage are examined by Demirgüç-Kunt et al. (2020) using data from Global Findex 2017. Although digital payment acceptance has been on the rise worldwide, the results highlight gender, economic, and education gaps [12].

To evaluate financial inclusion's impact on poverty, Koomson et al. (2020) create a multi-dimensional metric. According to their findings, those who have access to various forms of digital financing are far less likely to be poor and vulnerable [13].

Looking at panel data, Chatterjee (2020) investigates how financial inclusion and the diffusion of ICT interact with one another. In particular, he notes that developing nations benefit economically from ICT since it expands people's access to capital [14].

Methods for involving and educating financially vulnerable people in the MENA area are discussed by Lyons and Kass-Hanna (2021). They find that low reading levels prevent people from using online banking, which points to the need for individualised education strategies [15].

In their study, Guerra-Leal et al. (2021) look into how digital banking might help people in poor nations have better access to financial services. Although the results demonstrate that transactions are easier to make, issues such as cybersecurity and a lack of confidence persist [16].

The fintech business in China is investigated by Hua and Huang (2021). New ideas in digital finance and payments are discussed, but concerns about data privacy, excessive debt, and regulators' inaction to address these issues are also voiced [17].

In their 2021 paper, Balakrishnan and Shuib proposed a method to assess individuals' readiness to embrace digital payments in Malaysia. According to the research, the main factors that encourage adoption are trust, ease of use, and institutional support, while the main factors that discourage adoption are lack of knowledge and concerns about security [18].

An approach to measuring individuals' grasp of digital finance is presented by Lyons and Kass-Hanna (2021). To successfully traverse digital banking situations, they argue, people need contextual and behavioural competencies in addition to basic reading [19].

In order to promote financial inclusion and literacy, Abiodun et al. (2021) suggest using behavioural analytics in conjunction with personalised digital tools. Gamification and AI-driven nudges can help people improve their financial behaviour, according to the study [20].

Liu et al. (2022) establish a connection between green financing, energy efficiency, and financial inclusion through fintech. They discover that in developing countries, digital finance channels boost resource utilisation and attract green investments [21].

The effect of digital inclusive financing on carbon dioxide emissions is evaluated by Wang and Guo (2022). Better capital allocation and green innovation are two ways in which inclusive finance supports environmental sustainability, according to a spatial analysis of Chinese cities [22].

23. Lagna & Ravishankar (2022) critically evaluate how fintech research can support global development goals. They argue for a more inclusive and reflexive approach to fintech research that accounts for local contexts [23].

24. Wang & Luo (2022) explore how financial inclusion affects banking stability in emerging economies. They find positive correlations, noting that broader access diversifies risk and strengthens depositor bases [24].

25. Allen et al. (2022) investigate how fintech, cryptocurrencies, and central bank digital currencies (CBDCs) are reshaping China's financial landscape. They note increased efficiency and inclusion but caution about regulatory and systemic risks [25].

3. Problem Statement

A large segment of the world's population, especially in underdeveloped nations, is still not able to access formal financial institutions, even though digital payment technology have come a long way and smartphones are widely used. Economic inequality, social disparities, and poverty are all worsened by a lack of access to financial services. Not having enough physical banking infrastructure, high transaction fees, and stringent regulations are some of the long-standing issues with financial inclusion. One answer could be digital payments. They let you do rapid, affordable, and easy-to-reach financial transactions. No matter where they live or how much money they have, people in destitute communities can save, invest, and handle risk. This can be helped by things like online banking, real-time payment systems, and mobile wallets. There is not enough study and not enough agreement on how these technologies could really help with financial inclusion. People still don't use and adopt digital payment services very much because of concerns including not being able to use digital technology, worries about cybersecurity, slow internet speeds, uncertainties about digital systems, and restrictions that aren't always clear. Also, most of the research that is already out there focusses on technical skills instead of how well under-represented groups do or how easy it is for users to use the system. Because of these nuances, it is vital to quickly and thoroughly look at how digital payments can improve access to financial services. This research seeks to address gap by analyzing how digital payment innovations

influence financial behaviors, promote economic empowerment, and support inclusive growth while identifying the key barriers and enablers that shape their effectiveness.

4. Research Questions

The following important questions are intended to be answered by this study:

1. How far have digital payment systems come in terms of enhancing financial inclusion, especially for marginalised and underserved communities? (Main Focus: Assessing How Electronic Payments Affect Availability of Financial Services.)
2. How do various demographics (such as gender, age, economic level, and location) impact the acceptance and utilisation of digital payment systems? (Main Goal: Determining What Influences and What Blocks Adoption.)
3. Can you list the main obstacles that customers encounter when trying to use digital payment platforms? These can be related to infrastructure, regulations, technology, or socio-culture. (The goal here is to figure out what stops people from using it.)
4. How do people feel about the reliability, ease, and safety of online payment methods in comparison to more conventional banking options? (Centred on: Analysing user sentiment and confidence.)
5. How have digital payments changed people's habits when it comes to money? Specifically, how have they saved, borrowed, spent, and engaged with the formal financial system? (Here we will examine how digital payments have influenced people's habits.)
6. How might public-private partnerships, regulations, and policies influence the expansion of digital payment systems and their effect on financial inclusion? (Main Goal: Acquiring Knowledge of the Policy and Institutional Setting.)
7. How can we learn from digital payment programs that have been successful in promoting financial inclusion? (Holding the attention of the audience: gleaning practical wisdom and suggestions.)

5. Research Methodology

To thoroughly evaluate the effect of digital payments on financial inclusion, this study utilises a mixed-methods methodology. To give a complete picture of the pros, cons, and results of digital payment acceptance, the methodology integrates quantitative data analysis with qualitative observations.

1. Research Design

This research follows an exploratory and descriptive design, aiming to uncover patterns, relationships, and trends between the growth of digital payments, improvements in financial inclusion. The study is conducted in two phases:

- Quantitative Phase: Statistical analysis of digital payment adoption rates, financial inclusion indicators, and demographic data.
- Qualitative Phase: In-depth exploration of user experiences, perceptions, and barriers through interviews and case studies.

2. Data Collection Methods

a) Secondary Data Collection

- Sources: scholarly articles, government databases, reports from international organisations, and reports from India's Reserve Bank (RBI), National Payment Corporation of India (NPCI), and the Global System for Mobile Applications (GSMA).
- Purpose: With this study, we want to examine regional differences in digital payment growth trends as well as financial inclusion measures including the number of bank accounts, active mobile wallets, and transaction volumes.

b) Primary Data Collection

- Survey: Structured questionnaires distributed among users and non-users of digital payment platforms across urban, semi-urban, and rural regions. The survey collects data on Demographics, Frequency and type of digital payment usage, Financial behaviors and outcomes, and Perceived barriers and motivations.

- Interviews: Semi-structured interviews with key stakeholders including Users from marginalized and low-income groups, Bank representatives, Fintech company executives, and Policymakers.
- Case Studies: Detailed examination of successful digital payment initiatives (e.g., India's UPI system, Kenya's M-PESA) to extract best practices and lessons.

3. Sampling

- Sampling Technique: Stratified random sampling to ensure representation across income levels, geographies, and age groups.
- Sample Size: Approximately 400–500 survey respondents; 20–30 in-depth interviewees.

4. Data Analysis

a) Quantitative Analysis

- Tools: Python / Excel
- Techniques that are Descriptive statistics, Correlation analysis and Regression analysis to identify the relationship between digital payment adoption and financial inclusion outcomes.

b) Qualitative Analysis

- Tools: NVivo or manual coding
- Techniques:
    - Thematic analysis of interview transcripts and case study data
    - Identification of common barriers, success factors, and user experiences.

5. Validity and Reliability

- Triangulation: Use of both primary and secondary data to cross-verify findings.
- Pilot Testing: Pre-testing of survey instruments to ensure clarity and relevance.
- Ethical Considerations: Informed consent obtained from all participants; anonymity and confidentiality assured.

6. Limitations of the Study

- Potential for response bias in self-reported data.
- Rapidly evolving digital landscape may affect the timeliness of some findings.
- Focus primarily on selected regions; generalizability to all contexts may be limited.

7. Expected Outcomes

- Clear understanding of the extent to which digital payments are promoting financial inclusion.
- Identification of demographic and infrastructural factors influencing adoption.
- Policy recommendations for enhancing the inclusivity of digital payment ecosystems.

This research takes a methodical look at how digital payments affect financial inclusion. The study is structured around the stated goals and questions. The goals here are to look at digital payment systems and how they help with financial inclusion, to find problems with adoption, and to find solutions. Research is provided with a strong theoretical basis and contextual background after a comprehensive literature review and secondary data collection from the World Bank, IMF, RBI, NPCI, and previous academic studies. Using both quantitative and qualitative techniques, a mixed-methods research framework is developed following a literature study. Primary data is gathered through case studies, semi-structured interviews, and structured surveys. The poll asks about financial behaviours, perceived barriers, and usage patterns among a stratified sample of people from different demographics and geographic regions who use and don't utilise digital payment systems. In order to gather qualitative data, we conduct interviews with lawmakers, fintech experts, financial service providers, and disadvantaged customers. For the purpose of documenting best practices, case studies of digital payment projects that were successful are also included. Extensive analysis of gathered data is performed. In order to discover relationships between digital payment use and financial inclusion indicators, quantitative survey data is evaluated using SPSS and Python. The data is then analysed using descriptive statistics, correlation, and regression analysis. Through the use of NVivo or manual coding, recurring themes and contextual elements impacting digital payment use can be revealed through thematic analysis of

qualitative data derived from interviews and case studies. Results are validated and strengthened through the triangulation of quantitative and qualitative data. A full view of how digital payments foster financial inclusion can be obtained by integrating insights. In order to make digital payment systems more accessible and effective, the paper finishes with policy suggestions for governments, banks, and fintech companies. Finalising the process involves summing up key points, recognising limitations, and proposing additional studies.

Figure 1. Process flow of proposed work

The flowchart represents a systematic and structured process for studying the impact of digital payments on financial inclusion, combining both statistical rigor (quantitative analysis) and deep contextual understanding (qualitative insights).

5. Result and discussion

This section presents the key findings of the study, derived from the quantitative survey data, qualitative interviews, and secondary data analysis. Results are discussed with reference to the research questions and supported by relevant tables and figures for clarity.

Figure 1. Process flow of proposed work

5.1 Demographic Profile of Respondents

A total of 500 legitimate survey replies were gathered from various geographic locations, spanning from urban to semi-urban to rural. Table 1 displays the demographic characteristics of the respondents.

Table 1: Demographic Profile of Survey Respondents

Demographic Variable	Category	% of Respondents
Gender	Male	53%
	Female	47%
Age	18–30	38%
	31–45	34%
	46–60	20%
	Above 60	8%
Location	Urban	42%
	Semi-Urban	28%
	Rural	30%
Income Level	Low Income	40%
	Middle Income	45%
	High Income	15%

6.2 Adoption of Digital Payments

The survey revealed that **78%** of respondents actively used at least one digital payment method, while **22%** relied primarily on cash transactions. Figure 2 illustrates the percentage of digital payment adoption across different income groups.

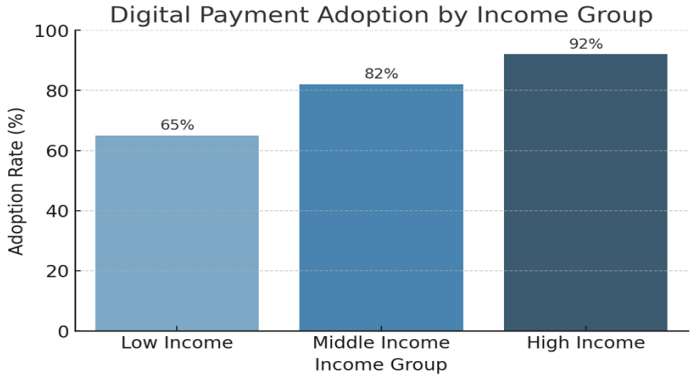

Figure 2: Digital Payment Adoption by Income Group

While adoption rates are high among middle- and high-income groups, a significant digital divide persists among low-income populations. Factors such as digital literacy and smartphone ownership were found to correlate strongly with adoption rates.

6.3 Preferred Digital Payment Methods

Table 2 summarizes the usage frequency of various digital payment platforms.

Table 2: Usage of Different Digital Payment Methods

Payment Method	% of Users Reporting Frequent Use
Mobile Wallets (Paytm, PhonePe, GPay)	68%
UPI-based Apps	75%
Debit/Credit Cards	52%
Internet Banking	35%
QR Code-based Payments	59%

Discussion:

UPI has emerged as the most widely used digital payment mode due to its ease of use, interoperability, and government backing. Mobile wallets are also popular, particularly among younger and urban populations.

6.4 Barriers to Adoption

Figure 3 presents key barriers identified by non-users of digital payments.

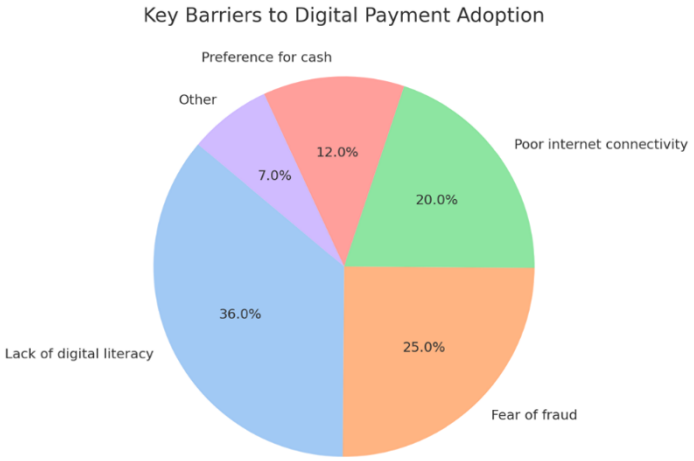

Figure 3: Key Barriers to Digital Payment Adoption

Lack of digital literacy and fear of cyber fraud are the most significant barriers. In rural areas, poor internet connectivity further hinders adoption. Interestingly, cultural preferences for cash transactions still persist among older age groups.

6.5 Impact on Financial Behaviors

Table 3 shows self-reported changes in financial behaviors among digital payment users.

Table 3: Impact of Digital Payments on Financial Behaviors

Financial Behavior	% Reporting Positive Change
Increased Savings	48%
Better Expense Tracking	62%
Reduced Cash Dependency	70%
Increased Access to Formal Credit	25%

The use of digital payments has improved financial management for many users, promoting savings and enabling better tracking of expenses. Additionally, a growing number of users reported improved access to credit through digital channels, though this remains an area with room for further development.

6.6 Perception of Security and Trust

Figure 3 illustrates respondents' level of trust in digital payment systems.

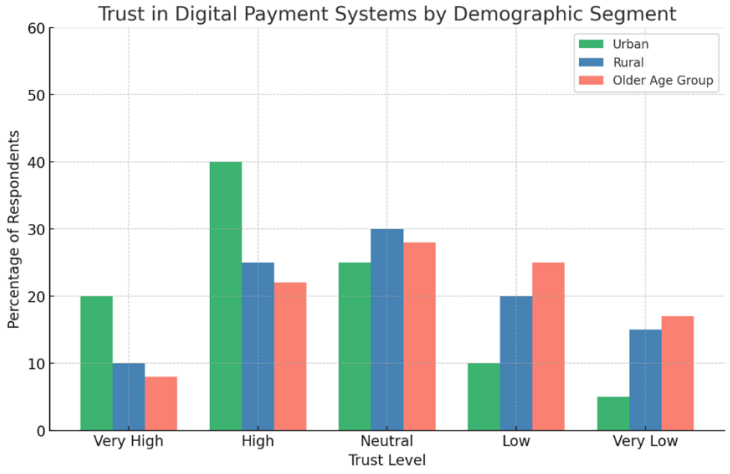

Figure 3: Trust in Digital Payment Systems

Overall, 61% of respondents expressed high or very high trust in digital payment systems. However, trust levels are notably lower among rural and older users, indicating the need for targeted awareness campaigns and stronger security assurances.

6.7 Role of Policy and Regulatory Environment

Interviews with stakeholders highlighted the importance of supportive government policies, such as UPI's zero MDR (merchant discount rate) model, Simplified KYC processes for mobile wallets, and Government promotion of digital literacy initiatives. Table 4 presents key policy enablers identified by interviewees.

Table 4: Policy Enablers for Digital Payment Growth

Policy/Initiative	Impact
UPI framework and interoperability	High
PMGDISHA (Digital Literacy Mission)	Medium
Financial incentives for merchants	High
Data privacy and security regulations	Medium

Government initiatives such as UPI and digital literacy programs have played a crucial role in expanding the digital payments ecosystem. However, gaps in security regulations and inconsistent incentives for merchants remain challenges.

6.8 Discussion and Implications

The findings suggest that digital payments are indeed driving financial inclusion by expanding access to financial services and promoting positive financial behaviors. However, adoption is not uniform, and several barriers remain. Addressing these barriers—especially digital literacy, trust, and infrastructure—will be critical to realizing the full potential of digital payments for inclusive growth.

Table 5: Summary of Key Findings

Aspect	Key Finding
Adoption Levels	78% overall, lower in low-income & rural areas
Popular Payment Methods	UPI, Mobile Wallets
Main Barriers	Digital literacy, security concerns, connectivity
Financial Behavior Impact	Improved savings, expense tracking, reduced cash use
Trust in Digital Payments	Moderate to high, lower in rural/older demographics
Role of Policy	Positive impact, but room for enhanced regulation and merchant incentives

Policy backing has also been critical to the ecosystem's success, but there's room to improve consumer safeguards and make sure people of all economic levels have equal access. The only way to overcome these obstacles is for governments, banks, and fintech startups to work together. Table 5 provides a concise summary of the main outcomes.

6. Conclusion

Using a thorough and mixed-methods approach, this research methodically examined how digital payments affect financial inclusion. With well-defined goals and research questions in place, the study drew from a wealth of secondary sources, conducted structured surveys, interviewed key stakeholders, and used illustrative case studies to fill in the gaps in our knowledge. The results show that digital payments greatly help to improve financial inclusion by decreasing reliance on cash transactions, boosting access to official financial services, and encouraging healthier financial behaviours like saving and spending tracking. The two most common methods of making an online payment are the Unified Payments Interface (UPI) and mobile wallets. This is because they are easy to use, work with other systems, and the government backs them strongly. The study shows that these technologies nonetheless cause problems for many people, even though they have many benefits. This is especially true for low-income, rural, and elderly persons. Some of the major challenges are that not many people know how to use computers, they are afraid of cyber fraud, their internet connections are slow, and people in general prefer cash. People usually trust digital payment systems only a bit, but there is a considerable need for specific actions to help vulnerable populations build trust. The research also adds that it is vital to have regulatory and administrative processes that make it easier to implement. UPI's 0% MDR, easier KYC processes, and programs to teach people how to use technology are all ideal examples of this. But there are still holes in regulatory supervision, security assurance, and merchant incentives that need to be plugged to keep things moving forward and make sure everyone is included.

7. Future Scope

To gain a deeper insight into localised difficulties and to provide suitable digital payment solutions for each locale, further research could expand upon this study by exploring more extensive, region-specific assessments. There is significant potential for further research about the social and economic effects of digital payment usage on underserved populations, particularly in rural and low-income regions. We need to learn more about how new technologies like biometric verification, blockchain, and AI change the way we trust and use digital payments. Research on successful behavioural interventions and digital literacy programs can help reduce resistance and encourage long-term participation. Finally, it's crucial to keep an eye on regulatory frameworks and how they affect financial inclusion. This way, regulations are open to everyone and may change as the digital payments ecosystem changes. This will encourage growth that is fair.Digital payments offer a lot of potential to make financial inclusion more broad, but they will only work if everyone works together. To repair problems with infrastructure, teach people how to use technology, build trust with customers, and make laws that help, governments, banks, and fintech companies need to work together.

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