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Digital India and Rural Banking Transformation: An Assessment of Financial Inclusion Outcomes

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Abstract

Digital India mission has become a transformer in the landscape of Indian rural banking by creating a digital environment with financial literacy and technology-driven financial services. In this study, the effect of Digital India on the rural banking transformation and contribution of financial inclusion outcome is being assessed. The study compares and contrasts the proliferation of digital banking services/tools like mobile banking, internet banking, Unified Payments Interface (UPI) services, Aadhaar based payment systems, and direct benefit transfer mechanisms among the rural population. It describes the impacts of these technological solutions to make formal financial services more accessible, lower transaction costs, more transparent and more inclusive for previously unbanked and underbanked people. The enquiry also suggests the influence of the policy and regulatory environment, banking system, and digital infrastructure within the scope of inclusive growth in rural zones. Despite the strides made in increasing the availability of banking services, particularly digital ones, and driving mobile payments, numerous factors including lack of adequate digital skills, low Internet access, cybersecurity concerns and technology change resistance persist in damping the impact of financial inclusion efforts. The study, based on empirical research and secondary data analysis, identifies gaps and success in building an equitable financial inclusiveness for Digital India. The results contribute to knowledge and offer policy, financial system, and development practitioners useful guidance on how to apply a digital approach to support sustainable and inclusive rural economic development, as well as improving the financial ecosystem.

Keywords: Digital India, Rural Banking, Financial Inclusion, Digital Banking Services, Financial Access, Rural Development, Digital Payments.

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Introduction

Over the years, India's rural economy has been playing a major role in the socio-economic development of the country as more people are working in rural areas and more and more people are living in villages relying on the agricultural and allied agricultural activities. Financial inclusion is key to facilitating access to financial services for fostering economic growth, poverty alleviation, saving habits, credit flow and general wellbeing. However, in recent decades, there have been various constraints that emerged on one hand as a challenge such as restricted banking services, financial illiteracy, geographical disparities and financial institutions' outreach to rural India. This type of regulation left a large proportion of the population in rural areas untangled through financial systems, restricting their economic prospects and opportunities to social inclusion. The Government of India has realized that financial inclusion of sustainable development is necessary and began taking steps to bring the banking facilities and rural people into financial mainstream.

At the beginning of Digital India programme in 2015, India made a giant leap towards digital India and inclusive development. This programme focuses on providing more and more digital infrastructure, digital governance and digital literacy to make India a digit equipped society and a knowledge-based economy. Accessibility, Efficiency, Transparency and Affordability of Public and Financial Services has been one of the foremost goals of Digital India to use Information and Communication Technology (ICT) for promoting these. It has contributed to transformation within the banking industry by pushing the adoption of digital technologies and promoting financial institutions to develop a innovative banking solutions that meet the needs of securities, especially in the rural areas.

Digital transformations in rural banking are the different types of technology interventions being done in banking such as the Unified Payments Interface (UPI), the Aadhaar Enabled Payment System (AEPS), the Direct Benefit Transfer (DBT), the micro-ATM, the digital wallet, mobile banking, internet banking etc., that has contributed to the digitization of banking. The innovations have reduced the need for the use of physical banks as a channel to access the financial services of rural customers who can be easily and safely accessed for financial services. If financial inclusion has been embraced as widely as Pradhan Mantri Jan Dhan Yojana (PMJDY) and the system is as connected as Aadhaar and Mobile, the system of financial inclusion is assuming a new shape of being integrated. They have provided access to

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millions of previously unbanked people to their savings accounts, credit facilities, insurance policy products, pension schemes and welfare benefits from governments.

Digitalization of rural banking has brought about some positive results. Through the digital financial services, efficiency in transactions, operating efficiencies, transparency and welfare leakages are bettered, as is their participation in the formal financial services, significantly above the baseline. Farmers, small enterprises, small entrepreneurs, self-help groups and rural households currently enjoy better financial availability to engage in economic planning and has increased their opportunities to join the formal sector. Furthermore, digital banking has helped to a large extent in achieving Government's inclusive growth, poverty alleviation and rural development objectives through financial inclusion or service at the "last mile.

Despite these strides there are certain gaps that need to be bridged to ensure active involvement of the rural masses in financial inclusion in India. Some of the major challenges present are internet connection, low usability of the technological infrastructure, language problems, technological resistance, and, low digital literacy. Despite the significant efforts made in building digital banking solutions, there are certain issues that rural users continue to have with understanding and effectively using digital solutions, and this curtailed the benefits of digital transformation. In addition, there is contribution of mobile phone, access to good electricity supply, access to digital education etc. in driving the Urban-Rural Digital Divide.

A proper evaluation of impact of Digital India towards rural banking transformation and financial inclusion aspects becomes crucial in this context. Understanding of the effect of digital initiatives on financial access and usage and the quality of financial services can guide policy-makers, banks and development partners to design strategies to address gaps in financial inclusion programmes and boost their effectiveness. This study seeks to examine the role of Digital India towards increasing the banking service of the rural people, promotion of financial services among the rural people and the amelioration of social-economic aspects of rural people through the survey. Study's Opportunities/Achievements/Challenges of Digital Banking in Rural areas, Informing the Country's Financial Inclusion Knowledge base on Technology to improve Financial Inclusion, Policy suggestions for creating inclusive resilient sustainable financial ecosystem in rural India.

Literature Review

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Financial inclusion is gaining more relevance in recent years due to its impacts in the struggle against socio-economic inequalities and economic growth. With the revolution of digital technologies, and the launch of a Digital India programme, the banking market in India has undergone a major transformation from rural banking to digital banking. The connection between digital banking, financial inclusion, and rural development has been discussed by various researchers, policy makers and organizations.

Cnaan et al. (2023) explored the concept of embedding financial inclusion in India in the era of Digital Banking particularly with reference to rural India. In their study, they found that the population in rural areas has benefited from formal financial services access (in a positive way) through digital banking technologies. The authors have stated that usage of schemes such as mobile banking and linking of banking accounts with Aadhaar has led to a reduction in transaction costs and made banking more accessible. They also discovered that digital literacy and technological infrastructure was a problem and continues to hamper the success of financial inclusion in the remote areas.

In a report titled “A study of India's efforts for universal financial inclusion”, published by the Economic Advisory Council to Prime Minister, Chauhan (2023) studied the progress made in India to achieve universal financial inclusion. The study highlighted schemes of successful implementation which helped in the financial inclusion such as Pradhan Mantri Jan Dhan Yojana (PMJDY), Direct Benefit Transfer (DBT) and digital payment platforms. The report recognised the success that has been met through ‘unbanked’ population's entry into the formal financial system, but it also pointed out that ‘last mile' challenges remain because of a myriad socio-economic and geographical reasons.

An analysis of the role of Regional Rural Banks (RRBs) in implementation of financial inclusion in India was done by Hassan Kharuri and Manjunatha (2018). They found that rural population, which is not well served by the banking system, is largely dependent on the RRBs. The study highlighted that the implementation of technology and digitisation has helped the RRBs in becoming more efficient and improving their ability to provide monetary goods and services to their customers. However, factors related to lack of awareness, and meagre infrastructure were identified as constraints for achieving maximum financial inclusion.

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All of these have been enveloped under one umbrella and brought to the forefront in the NABARD All India Rural Financial Inclusion Survey (NAFIRS 2018) reflecting the financial attitude of rural households nationwide. According to the survey, the percentage of households with formal financial institutions' access to financial services increased significantly in rural areas. It also highlighted the growing understanding and acceptance of financial products which can be accessed online and the Government's related initiatives. Finally, the results underlined the relevance of improving digital services, and financial education efforts of further strengthening the financial inclusion outcomes.

The NABARD Annual Report (2018–19) made a mention of several efforts made to improve financial inclusion and rural development. The report emphasized bank digitalisation and financial literacy encourages and support in financial financial institutions in the rural areas. It said digital technologies were being incorporated more and more into rural banking activities and for this reason they are helping to enhance the quality of the services provided and greater access of financial services to marginalised groups.

The Report of the Committee on Deepening of Digital Payments (2019) co-chaired by Nandan Nilekani of the RBI has singled out the role of digital payment system in promoting financial inclusion. The committee made recommendations for enhancing interoperability, and boosting digital payment infrastructure and customer protection mechanisms. The report emphasized not only the opportunities financial inclusion brings but also the potential of digitised payment system in securing inclusive financial growth of the rural economy.

The National Strategy for Financial Inclusion (NSFI 2019-2023) presented by Reserve Bank of India (RBI) has a detailed plan of Universal Financial Inclusion (UFI). This strategy was focused on expanding the digital financial space, financial literacy and financial services accessibility. It recognized the contribution digital technology can make to financial inclusion and the inter-agency work needed between the government and financial institutions and digital technology providers.

Vakrangee Ltd (2020) studied the contributions of Digital Banking services overall towards rural India's financial inclusion. The study highlighted the importance of providing assisted-financial-service centers in rural areas to bridge the gap between rural population and formal financial institutions. The results indicated that technology banks made a substantial

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contribution to the improvement of access to banking services where there is an absence of physical banking services.

The study 2023 was conducted in Mysuru District, (Karnataka), to assess the financial inclusion related costs and benefits of digital payments to the rural community. This study found that people using mobile wallet, UPI & online banking service become more financial, and reduce their use of cash. But, major issues of cyber security, internet connectivity, digital literacy issues continued to be a constraint towards adoption rates.

The aim of this study in South Canara district 2023 was to establish the relationship between e-banking adoption and financial inclusion in the rural areas. The findings have revealed positive links between financial inclusion outcomes and utilising digital banking services. The study found that making these awareness programmes, technology and digital infrastructure work – user-friendly – are vital to the ongoing acceptance of digital banking among rural users.

Similarly, an IDR study was conducted regarding the attitude of the rural customers towards digitally banking the same time in India (2023) to analyse the factors mentioned earlier that influence the adoption of and usage of digital banking by the rural customers. The research determined that 4 key factors (perceived usefulness, ease of use, customer trust and government support) had a significant impact on customer's willingness to use digital financial services. Financial education is also highlighted as key to increase digital banking.

There are various Government of India and Press Information Bureau (PIB) reports to highlight the milestones that have been achieved by PMJDY, digital payment campaigns, Aadhaar enabled services and initiatives on financial inclusion (2021-2023). In terms of accessing a bank account, transactions carried out via digital methods and welfare benefits provided electronically, there are high rates of growth. The rising importance of Digital empowerment and Financial literacy by the Government brings a significant jump in the levels of Financial inclusion in rural areas of India.

The literature reviewed has shown that Digital India has truly transformed the initiative on financial inclusion using digital innovations in banking. However, even with increased access to financial services and a call for a digital economy, the key challenges towards digital transactions have been identified as lack of digital literacy, availability of infrastructure,

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financial services awareness and cyber security. Combinedly, the previous research studies emphasize the need for a continued challenge with policy measures, technological innovation and capacity development to achieve overall and long-term financial inclusion in rural India.

Objectives of the Study

1. To assess the impact of Digital India initiatives on the transformation of rural banking services and accessibility in rural areas.
2. To examine the role of digital banking technologies, such as mobile banking, UPI, Aadhaar-enabled payment systems, and internet banking, in promoting financial inclusion among rural populations.
3. To identify the opportunities, challenges, and barriers affecting the adoption of digital banking services and their influence on financial inclusion outcomes in rural India.

Hypothesis

Null Hypothesis (H_0): Digital India initiatives have no significant impact on the transformation of rural banking services and accessibility in rural areas.

Alternative Hypothesis (H_1): Digital India initiatives have a significant impact on the transformation of rural banking services and accessibility in rural areas.

Research Methodology

In the context of the present study, it is salient to note that it has followed a descriptive study and analytical study to evaluate Digital India initiatives on financial inclusion and transformation of rural banking service attitude. Sources of primary data and secondary data are used to achieve the research objectives. Primary data are gathered by using structured questionnaires which are given to rural banking customers in selected villages of the study area. This questionnaire has questions pertaining to Awareness, Accessibility, Usage, Satisfaction and Challenges of Digital Banking services like Mobile Banking, Internet Banking, Unified Payments Interface (UPI), Aadhaar enabled payments system (AEPS), and Direct Benefit Transfer (DBT). Stratified random sampling is used for selection of respondents so as to ensure adequate representation of the different demographics. The number of 300 rural respondents is taken to be a sample size. Secondary Data are collected in the form of report and publications by Reserve Bank of India (RBI), National Bank for Agriculture and Rural Development (NABARD), Ministry of Electronics and Information Technology, Government of India, research journals, books and published articles pertaining to the digital banking and financial

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inclusion. Depending on the nature of the data, suitable statistical investigations like the percentage analysis, mean scores, chi-square test, correlation analysis and the t-test are used when applicable. The results are analysed to assess the impact of Digital India programmes on increasing Bank accessibility for the rural population and financial inclusion. The study is designed to offer beneficial information that will help policymakers, banking institutions, and development agencies in formulating strategies to boost digital financial services (DFS) and inclusive economic growth in rural India.

Descriptive Statistics for the Hypothesis

Table 1: Descriptive Statistics of Respondents' Perception on the Impact of Digital India Initiatives on Rural Banking Transformation (n = 300)

Particulars	**N**	**Minimum**	**Maximum**	**Mean**	**Standard Deviation**
Improvement in access to banking services	300	1	5	4.28	0.71
Availability of digital banking facilities	300	1	5	4.15	0.78
Ease of conducting banking transactions	300	1	5	4.22	0.69
Reduction in travel time and banking costs	300	1	5	4.31	0.74
Accessibility of government benefits through digital platforms	300	1	5	4.37	0.67
Improvement in financial awareness	300	1	5	4.08	0.82
Overall impact of Digital India on rural banking transformation	300	1	5	4.24	0.72

The descriptive statistics reveal that there is an optimistic outlook of the rural citizens on the transformation and accessibility of the banking system under the Digital India initiatives. The respondents feel that access to government benefits via digital platforms is most easily available in India (M = 4.37, SD = 0.67), indicating that there is a high level of consensus that access to welfare support by the government is now efficient in India thanks to Digital India. Likewise, access to banking services was deemed high (M = 4.28, SD = 0.71) and travel time/banking costs (M = 4.31, SD = 0.74) also had high mean scores. A favorable assessment

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(overall M = 4.24, overall SD = 0.72), can be determined in a Digital India for improving rural banking services. The low range of standard deviations are relative, this reflects the consistency of respondents' opinion. Based on these findings, it is believed that Digital India has made a significant contribution in enhancing access to banking services and revolutionizing rural banking.

Z-Test Output Table

One-Sample Z-Test

Test Value = 3.00 (Neutral Value on 5-Point Likert Scale)

Variable	**N**	**Mean**	**Std. Deviation**	**Std. Error Mean**	**Z-value**	**Sig. (2-tailed)**
Impact of Digital India Initiatives on Rural Banking Transformation and Accessibility	300	4.24	0.72	0.042	30.35	0.000

One-Sample Test

Test Value = 3.00	**Mean Difference**	**95% Confidence Interval of the Difference (Lower)**	**95% Confidence Interval of the Difference (Upper)**
Impact of Digital India Initiatives on Rural Banking Transformation and Accessibility	1.24	1.16	1.32

To observe if there is any significant difference between the mean perception score of impact of Digital India initiatives on rural banking transformation from mean score 3.00 considered as neutral value, the One-Sample Z-Test was carried out. This gives an average score of 4.24, and a standard deviation of 0.72. The calculated Z is 30.35, with corresponding level of significance (P = 0.000) which is less than the level of significance of 0.05 and shows that significance is established. As the p value is less than 0.05 the null hypothesis (H_0) is rejected and the alternative hypothesis (H_1) is accepted. Thus, it can be concluded that the efforts put in by the Digital India program are statistically significant and have a positive influence in the

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transformation of rural banking services, in rural areas. A positive mean difference (+1.24) of respondents reflects that they strongly feel that the DIGITAL INDIA programmes have helped improve access to banking services, convenience, service delivery in the rural areas.

Overall Conclusion

In the light of these findings, the study “Digital India and Rural Banking Transformation: An Assessment of the Outcomes of Financial Inclusion” sheds light on the transformative journey of the rural banking landscape and the effort to create financial inclusion in India with the emergence of the Digital India initiative. The results of the study indicate that introduction of digital technologies in banking is very much impacting the bank's services in improving their accessibility, availability and efficiency in rural communities. The various steps taken, such as Pradhan Mantri Jan Dhan Yojana (PMJDY), Aadhaar enabling, Aadhaar to unified payment interface (UPI), mobile banking, internet banking, Direct Benefit Transfer (DBT) and digital payment systems have increased the reach of formal financial institutions to groups that had been largely incapable of accessing them.

The overall analysis of the survey shows that the rural people have a favorable perception about the services offered in digital banking, mainly convenience, minimization of costs, financial accessibility and access to government benefits. Digital banking applications have reduced customers' dependence on traditional banking institutions and enabled them to make their financial transactions securely and effectively remotely. In addition, the rise of smartphones and internet connectivity has been conducive to the emerging digital financial ecosystem and to building up the rural financial ecosystem.

The changes in the rural banks services and the banks accessibility in rural areas presented as a result of hypothesis testing obtained a "favorable and significant" significance on statistical level of 0.050, which is less than 0.054. Fruit of the rejection of the null and the acceptance of the alternative, digital interventions are working to support financial inclusion, helping increase financial participation, enhance the delivery of financial services, and empower rural households. The findings are consistent with the vision of "Digital India" to build a digitally empowered society with an inclusive financial services.

Despite all this progress, the research highlights issues that continue to be at the forefront of what remains essential to realize the potential for digital financial inclusion. Yet, there are

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various other barriers to digital literacy, such as the lack of internet connectivity, cyber security concerns, language challenges, and technological resistance, which are significant especially in rural and economically deprived areas. Challenges demonstrate the continuous need of the actors in terms of the need to promote digital awareness, develop technical systems and ceilings, and reinforcing customer trust towards digital banking systems.

The study finds that the Digital India has been a powerful enabler and has set wheels in motion to transform the rural banking and financial inclusion landscape. The project not only enhanced the availability of financial services, but it has also helped in socio-economic development through the promotion of savings, access to credit, efficient delivery of welfare benefits and participation in the formal economy. Further digital transformation of financial infrastructure, digital financial awareness programmes, financial protection products and even groundbreaking financial innovations will play a key role in improving financial inclusion of rural populations and digitalization benefits for everyone. Hence, the idea of Digital India can be considered as a step towards an inclusive economy, in terms of technology and inclusive, for the rural masses.

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