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THE PORTRAYAL OF TECHNOLOGY IN THE MICROFINANCE SECTOR ACROSS INDIA

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Abstract

Technology has always been the catalyzing factor across industries of different domains. The microfinance sector in India has been an emerging areabooming to serve the people's requirements at the base of the economic pyramid of India. Although it is evolving year by year, it still lags behind the formal banking sector. The primary cause that hinders the microfinance sector is the poor technological adoption by the microfinance institution serving across India. When India is evolving as a developed economy, microfinance institutions should be at par with the country's formal banking system to capture the rural populace, accounting for seventy percent of India's population. With the advent of technology in the microfinance sector, some major problems can be addressed quickly, including automating the transaction process, analyzing and filtering data, and increasing operational efficiency and outreach. However, only the microfinance institution's technology adoption will not lead forward unless there is the timely implementation of technology and a substantial engagement of techno-suave employees to use it. Secondly, the state government of each state where the microfinance institutions are currently operating should initiate and encourage the technology adoption through the policy forums to become a mandate for the institutions to adopt it. By this adaptation, the microfinance sector would soon be able to reach out to the low-income generating segment of people across India at a much faster rate, which will ultimately lead the stakeholders of the microfinance sector to pump in more funds for the development and evolution of it at a larger scale and contribute significantly to the economy of India.

Keywords

Technology, Automation, Microfinance, Policy Forums

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To boost India's economy's substantial and rapid growth, three drivers need to be present, i.e., Technology, Innovation, and Knowledge. For the microfinance sector, effective absorption and utilization of data and information is a necessity. Proper management of data and implementing it in the right direction is what the microfinance sector demands these days. Since the microfinance sector is rapidly expanding its business in the length and breadth of India, it faces significant challenges regarding reaching out to its remotely located clients, providing them access to their services to the last mile, and many more. The robust intervention of technology would accelerate the flow of capital, automate transaction processes, analyze the data, increase the efficiency of its services, improve customers' experience, and capture more customers from the bottom of the pyramid. However, the microfinance sector's business and operation model significantly differs from the traditional banking industry and technologies. The major highlighting factor of the microfinance sector in developing countries is that it has drastically reduced the transactional cost and swiftly increased the customer outreach and penetration across the country after getting stabilized. Till now, Management Information System (MIS), Point-of-Sales technologies (POS), Automatic Teller Machine (ATMs), and Interactive Voice Response (IVRs) have successfully intervened in the microfinance sector. Ithas satisfied the process requirements for the same. These technological tool interventions have undoubtedly increased the efficiency of the institutions operating in the microfinance sector.

This qualitative study's objectives would primarily reflect the impact of technology utilization in the microfinance sector in India. Firstly, to determine the constraints faced for implementing and adapting technology in the microfinance sector and apprehend the significant role of ICT in the microfinance sector.

Quantitative Analysis of Developing Countries benefited by Technological intervention in MFIs

(ü - Technology Adopted; l - Technology Not Adopted)

Sl. No	Country	Technology Adopted by MFIs			
		ATM/POS[1]	Palm Pilot/PDA[2]	Smart Card[3]	Phone/ Internet Banking[4]
1	Chile	✓	●	●	✓
2	Bolivia	✓	✓	✓	●
3	Colombia	✓	✓	●	✓
4	Nicaragua	●	✓	●	●
5	Peru	✓	✓	●	✓
6	Guatemala	✓	✓	●	●

7	Honduras	●	✓	●	●
8	Ecuador	✓	✓	●	●
9	Mexico	●	✓	●	✓
10	El Salvador	●	✓	●	●
11	Haiti	✓	✓	●	●
12	Paraguay	✓	✓	●	●
13	Brazil	✓	●	●	●
14	Venezuela	●	✓	●	●
15	Costa Rica	✓	●	●	●
16	Dominican Republic	✓	✓	✓	●
17	Poland	✓	●	●	●
18	Albanian	●	●	●	●
19	Namibia	✓	●	●	●
20	Senegal	✓	●	●	●
21	Nigeria	●	●	✓	●
22	Botswana	✓	●	●	●
23	Cameroon	✓	●	●	✓
24	South Africa	✓	●	●	✓
25	Swaziland	✓	●	●	●
26	Zimbabwe	✓	●	●	●
27	Zambia	●	●	●	✓
28	Malawi	✓	●	✓	●
29	Tanzania	✓	●	✓	✓
30	Kenya	✓	●	✓	✓
31	Uganda	✓	●	✓	●
32	Armenia	●	●	●	✓
33	Tajikistan	✓	●	●	●
34	Kosovo	✓	●	●	●
35	Czech Republic	✓	●	●	●
36	Moldova	✓	●	●	●

37	Mongolia	●	●	●	✓
38	Bangladesh	✓	●	●	✓
39	Philippines	✓	●		✓
40	Indonesia	✓	●	●	●
41	Malaysia	✓	●	●	●

Table 1: List of developing countries which got benefited after introduction technology in their MFIs (Source: - *ADB Institute Discussion Paper No. 42, Information and Communication Technology and Microfinance: Options for Mongolia*)

The main reasons that appear to influence these developing countries to uptake the utility of ICT applications in microfinance are:

• Direct and indirect cost of implementing ICT applications

• Policy and regulatory environment

• Infrastructure development (communications, connectivity, power, etc.)

• Development stage of the financial sector, especially the microfinance sector

• Level of financial literacy (mentality towards using technology versus human interaction)

• Population density & Language.

Dependent on these factors, ICT solutions have been applied primarily in countries that have a more significant population density (such as India, Mexico, and the Philippines), a more favorable regulatory and policy environment (such as South Africa and Brazil), and a more mature financial sector (such as South Africa).

Comparative Analysis: - MFIs v/s Other Financial Institutions

Players like commercial banks, SFBs[5], MFIs, NBFCs[6], and not-for-profit MFIs enable micro-lending across India. MFIs hold the largest share of the loan portfolio, which stands at INR 681 billion and accounting for 38% of the total industry portfolio in 2019. It suggests that borrowers are more inclined to take loans from MFIs.

Out of the total client base of 423 lakh, the Southern region leads with 33%, followed by the Eastern region with 28%, Central region with 18%, and Western region with 9%. In contrast, Northern has 8% of total outreach. The Northeastregion has minuscule client outreach numbers with 4%. Share in outreach has expanded only in the Southern region from 31% to 33%, whereas the Eastern region reduced to 28% from 30%. North, West, Central, and Northeast regions have remained unchanged.

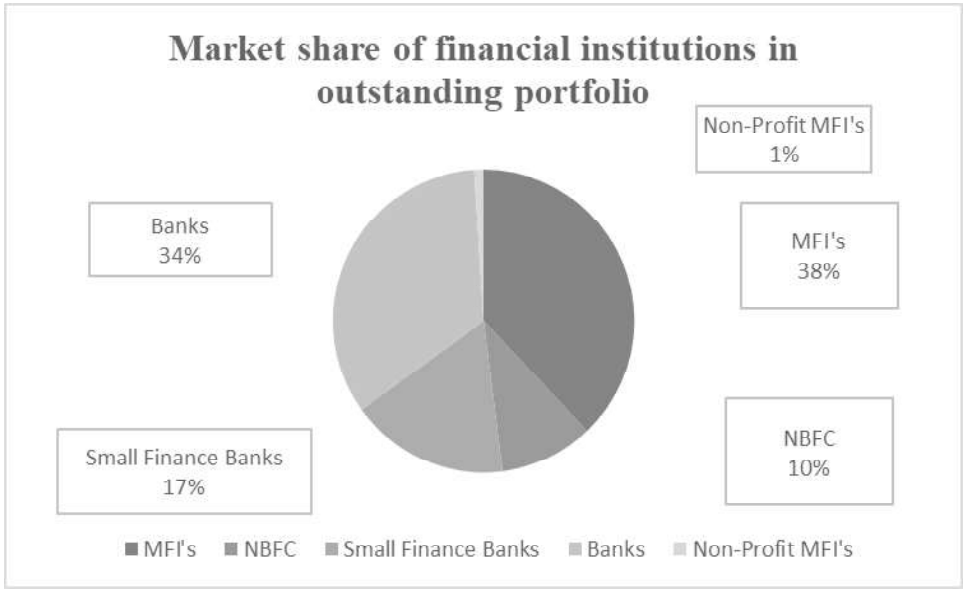

Figure 1:- ***Pie-chart representation of market share of financial institutions in outstanding portfolio (Source: - PWC[7]& sidbi[8])***

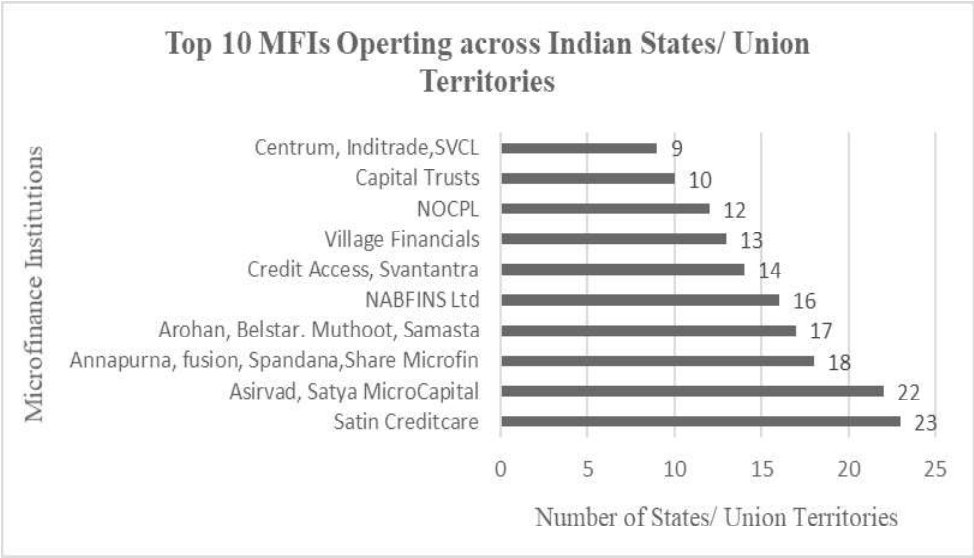

Figure 2:- ***Graphical representation of the operation of Microfinance Institutions across Indian States and Union Territories (Source: - Bharat Microfinance Report, 2020)***

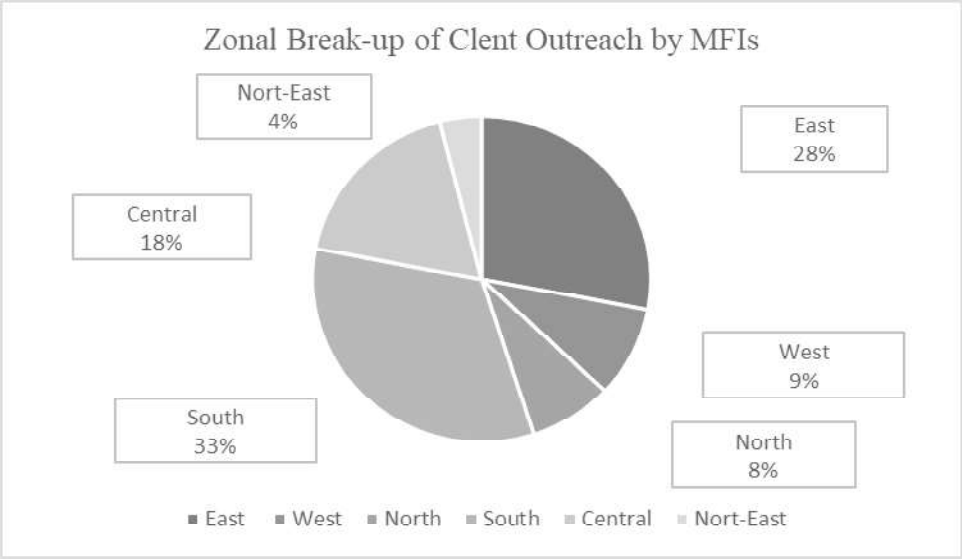

Figure 3:- ***Pie-chart representations of the client outreach by the Microfinance Institutions zone-wise (Source: - Bharat Microfinance Report, 2020)***

Budampati. V. S. Sowmya and Dr. Raghunath Reddy (2018), in their research entitled "Impact of Information Technology on microfinance Industry," studied that the intervention of technology has been the primary driving force for uplifting the microfinance sector across India. In this research, the authors tried to focus their views on the present conditions of the microfinance sector and how technology can enhance their present situation across India. The paper also mentions the modes of technology adaptations, which include e-payments, ATM cards, etc. At the same time, the paper also reflects the barriers to implementing and executing IT intervention, which affects the microfinance institution's growth across India. With this, the microfinance Institution's exponential degradation can diversely affect the populace residing at the bottom of the pyramid of the Indian economy.

It may be noted that M. Sravani (2013) has reflected similar work in her research entitled "Role of Technology in Microfinance Sector in India," which briefs about the necessity of technology in the microfinance industry in India. The paper also mentions the present condition of microfinance institutions across India and their struggles for making their services outreach to the rural populace. It elaborates on the modes through which technology plays its part in financial services and how ICT has helped the microfinance Institutions deliver their services most efficiently and effectively. Simultaneously, the paper also utters the problems that hinder technology intervention in microfinance institutions across India. The aspects of the

use of ICT in microfinance Institutions.[9]The author of this research paper also discusses some curative measures through which adopting and implementing the technology in the microfinance sector across India can be mapped sustainably.

Vijeta Singh and Puja Padhi (2015), in their research entitled "Information and communication technology in microfinance Sector: Case Study of Three Indian MFIs," clearly speaks about the role of ICT in bringing down the cost of MFIs.

The Management Information System (MIS) accounts for collecting, storing, tracking, retrieving, and using the information to better the organization or institution. The following functions are quickly served by information and communication technology (ICT).

The stored information helps the organization's loan officer track their client's repayment schedules and balances. It also helps in the quality assessment of the loan portfolio. It also helps in pushing the institutional progress towards the operational objectives. Work automation and access to information are being quickly figured out with the help of ICT.

Using ICT and Information Systems (IS) in microfinance institutions is now experiencing better transparency and efficiency and reducing transaction costs. The ICT can be effectively used for providing information related to a microfinance institution and the services offered by them because there is a shortage of information related to the terms and conditions that the microfinance institution offers. ICT can also be effectively utilized to monitor the microfinance institution's activities about the various stratagem that the Department of Rural Development implemented through impact assessment studies.

ICT can help create strong market linkages, cater to better prices across states in India, and enhance economic returns for microfinance activities by providing access to the global market with better prices. An application software named RURALBAZAR, an initiative by the **"Ministry of Rural Development, Government of India,"** has been designed to aid the rural producer's products' market needs. This software allows rural people to display their products globally with the help of the internet. The states who have already adopted this software's usage are Tamil Nadu, Goa, and Tripura.

Key Technologies Used By MFIs		
Technology	**Time of access into the institution**	**Basic Functionality**
Management Information System (MIS)	The first level of technology in all the organization	Data and Information recording and reporting
Point of Sales (POS) Technologies	The second level of interventions after MIS provides additional functionality	Expanding operational efficiency, maximizing outreach, and reducing cost

Integration Technologies	These are introduced in large organizations that havea rapid growth rates and usually leverage POS technologies	Integrating organization processes and systems with that of MIS, POS, and technologies

Table 2:- Key technologies adopted and used by MFIs across India (Source: - Collected from multiple sources)

Organization	Innovative technology adopted
BASIX (Largest Microfinance Organisation)	• Has started experimenting with handhelds and smart card technology to automate the loan disbursement process and tracking of the repayment schedules to reduce the workforce and cash holding costs • BASIX mobile Portfolio Management System also helps in minimizing the errors in the accounting process
Sahayata (Indian MFI)	• The innovative operational model used by the organization to delineate workload among staff, field credit officers so that their outreach to the clients can be maximized • The Central Processing Unit (CPU) of the Sahayata Model at Jaipur facilitates in processing the scanned copies from each of its branches scattered across India and updating them in their MIS

Table 3:- Examples of some MFIs who have adopted some innovative technologies for their organization

The introduction of technology accounts for creating problems regarding its acceptance by the microfinance customers/clients. These customers/clients are illiterate and fail to adapt to the technology,hinderingmicrofinance institutions' success. The constraints that arise while implementation is being discussed below:-

Sl. No	Constraints	Mitigation Techniques
1	Implementation of technological infrastructure serves to be a significant problem concerning institution establishment	Partnering or collaborating with tech start-ups such as InVenture, Artoo, and Gram Vaani
2	The business operation microfinance institution cannot satisfy the needs of the rural people of a particular geographic area since the households are located remotely in a scattered manner	MFIs should start organizing training camps for youth (at least one) from each family of the area so that they will be helping to penetrate deeper

3	When a microfinance institution tries to introduce a point of sales to its operating business model, but the target audience fails to adopt the technology due to a low level of knowledge, then implementation of the technology accounts for huge financial waste	Arrangement of knowledge and awareness camps by MFIs for the target populace of the area quarterly in a year
4	The donor funds that a microfinance institution receives from Development Finance Institutions (DFIs) are not adequately channelized and utilized by the microfinance institutions in educating the population in their specific geographic location where they usually operate	Setting up a particular task unit that will be entirely in charge of proper encryption of the funds received for social impact

Table 4: List of Technology Adopting Constraints and their Mitigation Measures
(Source: - collected from multiple sources)

Most microfinance institutions in India have started adopting technology in their business structure with the donors' funds. A few of the limitations that exist with the microfinance institution due to the adaptation of technology are as follows:-

Sl.No	Limitations	Reasons	Expected Solutions
1	Non-renewal of the licenses of the software used by MFIs	Lack of Funds for proper up gradation	Proper channelization of funds and inclusion in the financial year budget
2	No proper frontend and backend training is carried out at the MFIs	Lack Human Resources	Timely recruitment of dedicated candidates for employment
3	Irregular after-sales service by the technology service provider to the MFIs	Lack of Funds to initiate proper maintenance	Proper channelization of funds and inclusion in the financial year budget
4	Absence of the desired skillset within the employees of the MFIs	Lack of Proper Training	Regular encouragement to be given to the present employees to upgrade their skill set
5	The rural populace are still skeptical about adopting new technologies introduced by MFIs	Absence of Proper Empowerment	Regular training to be given to the rural populace for adopting new technology

Table 5:- List of Limitations after Adopting Technologies and their Expected Solutions (Source: - Collected from multiple sources)

The microfinance institution operates across after coming across the barriers/ hurdles in implementing and adopting technology. The significance of digitization through technology is being discussed here:-

Firstly the competitive advantage – where the microfinance institutions can achieve digitization with technology which would cater to providing microfinance plus services concerning encouraging entrepreneurship skillset and imparting financial literacy to the rural population

Secondly, defense against external shocks – where digitization with technology would help the microfinance institution reduce its dependency on the cash in loan disbursement and collection. The technology will work as a self-defensive system for the microfinance institution during the time of extraordinary situations like demonetization to make them adaptable to sudden changes in the market economy Lastly, cost and operation efficacy – where the adaptation of digitization through the use of technology can help the microfinance institutions to cut down the costs through the various passage which are likely- quicker services for loan disbursement and physical storage capacity replace with digital storage capacity and intangible reduction of cost like the risk associated with transportation of cash.

The microfinance sector has evolved in India in eliminating poverty, touching each corner of the country. The growth of this sector has come a long way by expanding its business to reach out to the needs of the rural customer base, but due to technology barriers on the way, the reach is confined to be limited. So to make the microfinance sector witness the role of technology entering into it and transforming itself, the following industry practices should be carried out in an effective manner which has been discussed below:-

Firstly evolving coherent MIS – With MIS usage in microfinance institutions, it would cater to its sustainable growth. It would help the institution in better forethought and management of its existing customer base and related data. Additionally, it would help the institution mitigate the risks associated with the operating business model, thereby increasing its efficiency while catering to the needs of the rural population.

Secondly, client-paramount access – Before the microfinance institution inculcates digital methods of the transaction using technology among its existing customer base and forces them to adapt to the same. They should take into consideration the present occupation and demographic status of their customers. With this, it would help the microfinance institution to

understand the need of its customer concerning remittance, financial planning, and loan disbursement process

Thirdly hand-holding clients – The customer base that the microfinance institution usually serves is not digitally literate. To address this problem, the microfinance institution should follow the human touch model. It should hire field officers and train them, who generally visit the rural populace residing in the country's remotest locations, and continuously motivate and train them with digital platforms. The microfinance institution should pump in money in the capacity building of its agents.

Lastly, experimentation – The microfinance institution should perform a heat and trial method with multiple innovations to design its product and delivery mechanism. Regarding this, the microfinance institutions can gather help from the self-regulatory organization to achieve the same. The microfinance institution should analyze the characteristics, benefits, and drawbacks of the technology they are trying to inculcate into their business model and customize their product design to serve the rural customer scale at large.

Technologies Usually Adopted by MFIs		
Technology	**Purpose**	**Website**
Artoo	It helps in empowering the social enterprise by capturing, analyzing, and processing the information collected remotely with the help of smartphones	http://artoo.in/
FINO	It has been helping the MFIs in linking the back-end with the frontier-end data for the smart cards	http://www.fino.co.in/
MFIFlex	It delivers a cloud-based banking solution specially designed for MFIs	http://www.mfiflex.com/
Soft-Tech	It has developed and delivers an OMNI Enterprise microfinance Solution, which is a robust and scalable platform and helps in automating all the core business processes of an MFI on a single technology backbone	http://www.infrasofttech.com/
Datavision Software Solution Pvt. Ltd	It has developed MICROMATE, a mobile-based application that helps in the collection of data by the field officers	http://www.datavsn.com/

Table 6:- ***Common technologies usually adopted by MFIs across India (Source: - Collected from multiple sources)***

With the advent of financial technology in India's microfinance sector, the financial landscape has undergone a drastic transformation catering to the optimization of microfinance institutions with Big Data, Artificial Intelligence, and Machine Learning usage. The impact of these tools is reflected in the microfinance institution in India has been discussed below:-

An unbiased decision by the microfinance institution while selecting customers for credit extensions can be catered. With this, microfinance institutions can study customer behavior patterns derived from industry data and work them accordingly. The big automatic data churned algorithm-based tool is helping the microfinance institution with loan processing requests, disbursement of loans within seconds. The microfinance institution now uses artificial intelligence (AI) and Machine Learning (ML) to service its customer base just in time to cater to the financial needs of loan ticket size and repayment frequencies.

The AI and ML also help the microfinance institution helps in predicting the portfolio behavior of its existing customer base scattered out in different geographic segments and accordingly predict defaults and credit losses more accurately. Big Data is helping microfinance institutions in designing and positioning their products according to the customer base's needs through data modeling, customer segmentation, and price modeling. Finally, M-Commerce and E-Payments have been appreciated by the Microfinance that helps the customer base access the credit options by enabling them to the loan approval mechanism through analytics.

In the microfinance sector, technology is not a product. The support service helps the sector deal with various services like credit, savings, insurance, and remittance. The sector can take the help of a technology-specialization organization. Three partnership models include the delivery channel model, which creates a partnership with retail stores and petrol pumps. Co-branding is also helping in the scaling of the business of the microfinance institution. Secondly, consortium model – where the microfinance institution's primacy is its financial services, and data consortium in microfinance institutions would help the institution scale-up issues like risk management and liquidity and lastly, outsourced services model – where the IT services and the back-end operations can be outsourced to an expert agency, which helps the microfinance institution focus on its core objective, i.e., providing the financial service.

Microfinance institutions improve their security by leveraging and experimenting with new technology and solutions for better client outreach, decision-

making, and operations. The way financial services are delivered is being revolutionized by technology, and the microfinance sector's technology landscape is being affected by the same disruptions. A large Indian small finance bank has partnered with a fintech company to implement a technology solution that includes Aadhar-linked know your customer (KYC), video ID verification, and e-document verification via Digi Locker, as well as artificial intelligence and machine learning technologies for fraud prevention, customer authentication, and automating the customer onboarding process.

In the light of the above discussion and taking the constraints that come across while the implementation and adaptation of technology by a microfinance institution operating its business across India, some recommendations that can be taken into account, which are being highlighted below:-

Firstly, temporary measures should be taken by the Government, NGOs, and supporting agencies while working collaboratively with a microfinance institution in educating the rural population before introducing them to the use of the technology aspect. The State Government should collaborate with the Central Government to establish proper infrastructural facilities for a microfinance institution to counter implementing and adopting technology.

Secondly, to boost digital transactions in the rural peripheries, the government should provide financial help to the panchayats, agricultural societies, and rural institutions to help educate, encourage, and onboard more consumers on digital platforms. Apart from providing a robust infrastructure, it can provide solid internet connectivity to sustain India's rural populace digitally.

Lastly, leading banks and industry developments must be considered for district-wise and block-wise economic opportunities and resource mapping. There is immense demand and supply gap in money demand by the poor and supply by the MFIs. So there needs to be active participation by the private sector in this Industry.

Since the inception of the microfinance institution, many perceived that it would not be a successful model as a substitute for the conventional financial system. However, it can be used as a tool to overcome the stages of poverty in obtaining credit and other financial services in a similar business manner as that of a formal baking system. Limited microfinance institutions have somehow managed to overcome barriers like transportation, communication, and information systems to be technology-ready. If government and MFIs act together, then microcredit can play a significant role in poverty alleviation. The challenging issue in microfinance helps to reduce the

financial problems faced by poor people. The inability of MFIs to get sufficient funds is a significant challenge in stable microfinance growth, and so these institutions should look for alternative sources of funds. The impact of microfinance is appreciable in bringing confidence, courage, skill development among poor people. Nevertheless, many microfinance institutions still cannot implement technology to boost their business across India effectively.

Note: -

The qualitative study is done on the recent movements in microfinance institutions and the technology shocks on India's sector. The data and information are secondary sources like published articles, websites, magazines, and newspapers. Along with this few information has been collected from academic and corporate professionals in this field of study.

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Footnotes

1. These devices conduct many banking transactions that would otherwise require staff attention: they furnish account information, accept deposits, draw down on pre-approved loans, and transfer funds.
2. Also called a Personal Digital Assistant. This is used by loan officers to process loan applications by using the preset credit scoring model, to review

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a client's historical data, and to monitor loan performance by reviewing the list of borrowers and their loan repayment status. Virtually all client data and client visit records are stored electronically and are immediately available in this small device

3 . This can be used for financial services, such as managing savings accounts, disbursing loans, or making transfers. There are different forms of personal identification, such as biometric technology and fingerprinting. Smart cards function as an electronic passbooks.

4. This facility helps the clients to make the same transactions as with phone banking (checking their account balance, making transfers, learning about products, and finding the nearest branch location and its office hours) on the Internet.

5. Small Finance Banks

6. Non-Banking Financial Companies

7. Pwc -PricewaterCoopers

8. Sidbi- Small Industries Development Bank of India

9 This can be further addressed in multiple ways which are highlighted below.

- Linking and mapping existing mainstream financial sectors with the MFIs for effective and sustainable outreach.
- Shifting in the approach: From Project Approach to Institutional Development Approach.
- Up-scaling of operations of MFIs and other microfinance promoters to accelerate outreach in terms of breadth, length, and depth.
- Developing appropriate mechanism of regulation and policy direction: National MF Policy-oriented with inclusiveness.