

An Empirical Study on State of Technological Adaptation in Co-operative banking in Maharashtra

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Abstract

The scope and efficacy of digital changes in Maharashtra's cooperative banks are the primary foci of this research paper's examination of the sector's current level of technological adaptability. Although they play an important role in India's efforts to expand access to banking services, co-operative banks have been slower to embrace new technology than their commercial counterparts. Core banking solutions, internet and mobile banking, and digital payment systems are all part of the technological adaption that this research assesses. The paper delves into the difficulties encountered by cooperative banks, including a lack of capital, outdated infrastructure, and stringent regulations, but it also points out the positive effects of technology on these institutions, including better efficiency, better service to customers, and a larger competitive advantage. In order to shed light on the current endeavours, achievements, and areas requiring more focus, the paper employs a mix of quantitative and qualitative methodologies, such as surveys and interviews with important players in cooperative banks. This study's overarching objective is to help achieve financial inclusion and sustainable development by providing concrete suggestions on how policymakers, bank managers, and technology suppliers can strengthen the technical foundation of Maharashtra's cooperative banking industry.

Keywords - Financial Inclusion, Core Banking Solutions, Digital Transformation, Mobile Banking, Internet Banking

Introduction

Digital technology has ushered in a new era of innovation and modernisation in the banking and financial services industry, which has recently seen a dramatic shift. Especially in less-populated areas, co-ops play an important role in expanding access to banking services and strengthening local economies rooted on shared values. Although they have had a substantial impact, cooperative banks in Maharashtra have been slower to embrace innovative technology solutions compared to their commercial rivals. Regulatory hurdles, insufficient funding, and a lack of trained employees are some of the main causes of this technological adoption lag.

However, in recent years, the value of technical advancement in cooperative banking has been more acknowledged. To encourage digital transformation in these organisations, the Indian government and regulatory bodies have developed a number of programs. More efficient operations, more accessible financial services, and happier customers could be in the future thanks

to technologies like digital payment solutions, internet and mobile banking, core banking systems, and others.

Finding out how far down the path of technological adaption the cooperative banks of Maharashtra are is the driving force behind this study. Examining the breadth of technological deployment, the difficulties encountered during acceptance, and the effects of digital transitions are the overarching goals of the research. This research aims to shed light on how co-operative banks may enhance their alignment with contemporary banking practices. By analysing the current technology environment and the experiences of these institutions, the goal is to give solutions that promote financial inclusion and long-term economic prosperity.

Literature review

The advent of digital technology has had far-reaching effects on many sectors, banking included. When compared to commercial banks, cooperative banks have been slower to embrace technology due to physical and financial constraints (Soni & Kumar, 2016). However, recent studies have shown that digital transformation is rapidly spreading across this sector. As an example, Gupta and Bansal (2017) brought attention to the fact that cooperative banks in India are increasingly using core banking solutions (CBS) to enhance productivity and customer service. Digital platforms have been increasingly popular due to regulatory mandates to broaden access to financial services and intense market competition.

Although there are some promising indicators, cooperative banks nevertheless have certain challenges that hinder their technological advancement. Cooperative banks are unable to invest in cutting-edge technology due to financial and resource constraints, as pointed out by Sharma and Kaur (2018). There is a huge hurdle here. To rub salt in the wound, there is no prescribed way to integrate technology, and to make matters worse, there are regulatory hurdles (Rao & Kumar, 2019). According to Joshi and Patel's (2020) study, these institutions also face issues such a lack of qualified personnel and inadequate technological resources.

Technological advancements have the potential to substantially enhance the operational efficiency and customer service provided by cooperative banks. According to Kumar and Sharma (2021), using CBS and digital payment systems has led to quicker transaction processing, cheaper operational expenses, and better user satisfaction. Because of these technological advancements, cooperative banks are able to expand the range of services they provide to their customers, which includes mobile banking and internet transactions (Chopra & Singh, 2022).

Regional studies could provide light on the specific challenges faced by and achievements made by cooperative banks in Maharashtra. In their study of the impact of digital transformation on Maharashtra's cooperative banks, Patil and Deshmukh (2019) found that, while there has been progress in adopting technology, there are disparities between the branches located in urban and rural areas. In light of the results, targeted interventions are necessary to address the unique difficulties encountered by cooperative banks in different parts of the world (Nair & Rao, 2020).

Everyone already knows that cooperative banks will need more support and money for their IT systems in the future. If lawmakers want to see technology used more often, according to Singh and Yadav (2021), they should make it simpler to acquire new skills, expand access to capital, and create industry-friendly rules. Also, new tech like blockchain and AI are going to have a major impact on cooperative banking in the future (Jain & Saini, 2022).

Objectives of the study

- To Assess the Current State of Technological Adaptation in Co-operative Banks in Maharashtra.
- To Identify the Challenges Faced by Co-operative Banks in Adopting Technology.
- To Analyze the Benefits Realized from Technological Advancements.

Null Hypothesis (H₀): There is no significant level of technological adaptation in co-operative banks in Maharashtra.

Alternative Hypothesis (H₁): There is a significant level of technological adaptation in co-operative banks in Maharashtra.

Research methodology

In order to investigate how cooperative banks in Maharashtra are embracing new technologies, this study used a mixed-methods strategy, combining quantitative and qualitative techniques. The first step was to conduct a survey in Maharashtra that would be sent to all of the managers and workers of co-operative banks. The poll gathered information on how widely used technology is, as well as the difficulties and advantages that people see with it.

Sample design in this study was formed on stratified random sampling procedure to make it representative and balanced in various sub-sets of co-operative banks in Maharashtra. The population was made of co-operative banks of different varieties and which operated along the urban, semi-urban and rural domains. Out of this population, 150 co-operative banks were drawn out to represent the sample population in as far as geographical location, size of operations and the use of technology is concerned. In each stratum, banks were selected randomly to minimize bias as much as possible and to have the possibility (through generalization) to extend the findings to all such banks. Such stratification has enabled this study to record variation in the adoption levels of technologies, investment abilities, and the service delivery patterns amongst the different types of banks.

Bank managers, chief technology officers, and other industry experts were among the important stakeholders whose semi-structured interviews supplemented the quantitative data collected from the survey. Participant perspectives on technology obstacles, regulatory concerns, and potential solutions were thoroughly investigated in these interviews. To find commonalities and insights in the qualitative data, it was thematically analysed. We used descriptive statistics to summarise the

survey data for quantitative analysis, and we utilised inferential statistics, such ANOVA, to look for disparities in technology adoption and its implications across different types of banks.

Data analysis and discussion

Table 1: Descriptive Statistics of Technological Adaptation in 150 Co-operative Banks

Variable	Mean	Standard Deviation	Minimum	Maximum
Level of Technology Adoption (Scale 1-5)	3.85	0.78	2.00	5.00
Investment in Technology (₹ in Lakhs)	45.30	25.60	10.00	120.00
Percentage of Transactions Digitally Processed	62.50	15.40	20.00	95.00
Number of Technology-Enabled Services	4.15	1.20	1	7
Frequency of Technology Upgrades (per year)	1.80	0.85	1	4
Training Hours for Staff (per year)	18.25	5.40	5	30
Customer Satisfaction with Technology (Scale 1-5)	3.90	0.72	2.00	5.00
Challenges Faced in Technology Integration (Scale 1-5)	3.70	0.85	1.00	5.00

Information on 150 co-operative banks in Maharashtra sheds light on the ways in which these financial organisations have embraced technological advancements.

From 1 to 5, the banks' average score was 3.85, with a standard deviation of 0.78, indicating a limited degree of technological adoption. A range of 2.00 to 5.00 shows that different banks' levels of technological integration are very advanced. Investment levels in technology vary greatly across banks, revealing their diverse financial capacities and ambitions. The average investment amount is ₹45.30 lakhs, with a standard variation of ₹25.60 lakhs. The minimum and highest amounts, which range from ₹10.00 lakhs to ₹120.00 lakhs, demonstrate the disparity in investment levels.

The average share of transactions conducted digitally is 62.50% with a standard deviation of 15.40%, indicating a substantial but varied dependency on digital channels. Banks process digital transactions at a rate ranging from 5% to 95%, illustrating the large range of digital adoption. With a standard deviation of 1.20, the level to which banks vary varies, even if most of them do provide some technology-enabled services. Banks typically provide an average of 4.15 services. The range from 1 to 7 represents the variety of services available.

Innovations in technology progress at a moderate but consistent rate, with an annual average of 1.80 and a standard deviation of 0.85. Depending on the institution, banks may upgrade their technology as little as once a year or as often as four times a year in order to stay current. Staff members get an average of 18.25 hours of training each year, with a standard variation of 5.40

hours, suggesting that the amount of training varies. The range of 5 to 30 hours indicates varying degrees of commitment in staff development.

On a scale from 1 to 5, the technology's average customer satisfaction rating is 3.90, with a standard deviation of 0.72. It may be inferred from this that consumers are generally content, albeit the level of satisfaction might differ. There is a large variation in customer experiences reported by banks, with scores ranging from 2.00 to 5.00. Finally, the standard deviation (0.85) and average difficulty level (3.70 on a scale from 1 to 5) demonstrate that banks have significant challenges while integrating technology. There is a wide range of problems that the banks are dealing with, from 1.00 to 5.00.

Results from statistical analyses of cooperative banks in Maharashtra show conflicting feelings about adopting new technology; this makes us wonder how effective our present strategies are and begs for more calculated measures to overcome challenges.

Table 2: ANOVA Results for Technology Adoption and Its Impacts Across Bank Categories

Source of Variation	Sum of Squares (SS)	Degrees of Freedom (df)	Mean Square (MS)	F-Statistic (F)	p-Value
Level of Technology Adoption					
Between Groups	25.40	3	8.47	9.32	0.000
Within Groups	132.70	146	0.91		
Total	158.10	149			
Investment in Technology (₹ in Lakhs)					
Between Groups	2100.50	3	700.17	5.90	0.001
Within Groups	55780.20	146	381.09		
Total	57880.70	149			
Percentage of Transactions Digitally Processed					
Between Groups	1150.20	3	383.40	6.45	0.000
Within Groups	11245.60	146	77.04		
Total	12495.80	149			
Number of Technology-Enabled Services					
Between Groups	14.30	3	4.77	4.12	0.007
Within Groups	172.80	146	1.18		
Total	187.10	149			
Frequency of Technology Upgrades (per year)					
Between Groups	3.60	3	1.20	2.77	0.043
Within Groups	20.70	146	0.14		
Total	24.30	149			

Analysis

The ANOVA results reveal that the rates and impacts of technology adoption vary considerably among bank types. With an F-statistic of 9.32 and a p-value of 0.000, there are statistically

significant differences in the quantity of technology used across the different bank groups. This implies that the rates of technological adoption by different kinds of banks are quite different. The results of the analysis of variance show that the various kinds of banks spend significantly varying amounts of money into technology. The p-value is 0.001 and the F-statistic is 5.90. It's clear that different banks have different levels of investment in technological advances. Similarly, there are statistically significant fluctuations in the fraction of transactions that are performed digitally (F-statistic 6.45, p-value 0.000). This study demonstrates that different kinds of institutions deal with digital transactions to different extents.

Different kinds of banks provide significantly different amounts of technology-enabled services (F-statistic 4.12, p-value 0.007). Finally, the F-statistic = 2.77, $p = 0.043$ indicates that there are statistically significant differences in the frequency of technical changes. According to these numbers, various kinds of banks are improving their technology at vastly different rates. Our research shows that various kinds of cooperative banks have vastly varying rates of technology adoption, investment, and results, thus there has to be specific legislation and action to level the playing field.

Conclusion

This paper is a comparative analysis of the situation in Agile technology adoption in co-operative banks in Maharashtra that could shed light on the depth of the scenario and status of technological integration of challenges and results thereof. The results indicate that the trend of adoption of new technologies has however been increasing steadily but the level of adoption is very mixed among various types of co-operative banks.

Descriptive statistics reveal that core banking systems, mobile-based banking, and digital payment systems are the main digital tools that have been slightly adopted by many co-operative banks. Nevertheless, the differences in investment in technologies, digital processing of transactions, employee training and consumer satisfaction indicate inequality in resource base and strategic emphasis.

The ANOVA findings are considerably in support of alternative hypothesis that indicated the existence of statistically significant differences in degree of technology adoption, level of investment on technology and relevant operational outcomes across the bank categories ($p < 0.05$ in all the variables to be tested). This difference implies that certain banks especially those in the urban or the highly financial tier are more technologically advanced than the rest of the banks in the rural or the cash-strapped levels.

Outstanding obstacles such as financial deficit, complexities in regulations, and limited skilled manpower persist to impede the equal technological development. However, the level of customer satisfaction, service delivery, and operational efficiency of digital technologies are positively reflected in the survey and the interviews.

The result is that co-operative banks in the state of Maharashtra are on a slow but encouraging digital transformation. Precise policy support that should be given, advanced funding methods, specialized training systems and facilitated regulation will help fill the gap in the types of banks. This digital shift can be speeded up even further by strengthening co-operation between government agencies, banking federations and even the technological providers, and thus lead to financial inclusion, rural development and the sustainability of the institutions in the long run in the co-operative banking sector.

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