RESEARCH PAPER

Implementation of AI driven Financial Technology in Indian Cooperative Banks – Opportunity or Challenge

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Abstract:
Cooperative banks are integral part of Indian Banking sector. Presently, Cooperative banks serve in two categories, rural sector and urban sector. Rural sector is further divided into three tiers structure i.e. State Cooperative Banks (StCB), District Central Cooperative Banks (DCCBs) and Primary Agriculture Cooperative Societies (PACS)while urban sector comprises of scheduled Urban Cooperative Banks (UCBs)& non-scheduled UCBs. Technology adoption and customer retention is equally challenging for all categories of cooperative banking sector.While some banks are aggressive in technology adoption and are offering all modern banking facilities like UPI, mobile banking, internet banking some are trailing behind due to lack of modern banking technologies. The RBI has laid down stringent norms for fulfillment of cyber security to accord digital banking permission. Customer retention has become a big challenge for cooperative banks as low technology adoption poses a big threat of customer attrition. The other threat comes from non-banking financial companies (NBFCs) which offers a big chunk of online financial services to customers. Inadequate manpower in cooperative banks has propelled the banks to adopt workflow automation. Many a banks have started using Artificial Intelligence (AI) tech bots in their day to day tasks like customer onboarding, helpdesk & call center operations, creating customer leads for loans portfolio, reconciliation, etc. This saves a significant time and manpower for banks. However, adoption of such AI technology involves huge cost, issues in integration with existing setup, security constraints, non-consonance with regulatory and legal fulfillment and the like. The research paper aims to critically analyze opportunities & challenges in adoption of AI in Cooperative Banking Financial Technology.

Keywords: Artificial Intelligence, Financial Technology, Automation, Cryptography

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Introduction:
Banking industry witnesses' cut-throat competition with modern technological innovations and Cooperative banks are no exception. Financial Technology aka Fintech is an enabler for bank to offer various customers focused services that not only eases operations but also assist management in making policies. With digital enablement Fintech is able to generate the required MIS that contributes to profit building and services expansion. Regulatory compliance is lot more easily than it was in earlier days of banking. Development of new banking technology regarding robotic processing, block chain, quantum computing, AI, augmented reality (AR) etc. transformed consumer experience (Hoyer et. al. 2022, Siau et. al 2022).
Cooperative banks are more focused to outreach to remote rural areas where banking facilities are not available. A complete financial inclusion is target approach. Innovations in financial technologies are presently not limited to the fulfillment of end users; it outreaches itself to robotic process automation thereby automating such tasks which are cumbersome due to serious crunch of talented manpower. It illustrates an integration of finance & IT for simplifying, illustrating, enhancement & automation of processes (Lam, 2025). The result is saving in manpower and cost. AI tools and techniques involve machine learning and creation of apps that require GPUs instead of CPUs which is a costly affair. Integration of AI based apps with legacy apps is challenging due to high costs, lack of technical expertise and management vision. Biallas& O'Neill (2020) discussed that AI on one side leverages the capability for fast and bulk processing but at the same time also poses challenge for the deployment of huge expenditure.
Fintech has offered various tools for the bankers to augment their sales capabilities, user demands and rendering of financial services to their customers (Ganguly&Arcot, 2024). Several areas that have been benefitted comprise of insurance leads, loan opportunities, mobile apps for several banking services, crypto based currency developments, investment opportunities, account aggregator services etc. technology penetration and adoption has made bankers vision clear for the future ready competition in banking environment. AI enhances financial inclusion, performance, fosters trust and eliminates technophobia linked to technology adoption (Sharma &Priya, 2025). Payment processing apps like bill payments, ticketing apps, web based payments for institutional expenditures have given a boost to institutional and commercial growth. This could become possible due to Fintech innovations. A click of button and entire transactions with reconciliation and MIS is ready for management review. Both customer and management

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is happy. AI made this even easier with robotic automation. Regulatory compliances, fraud analytics detection and mitigation, risk management has been boosted on account of AI & ML in Fintech (Saiyed, 2025). Market forecast and decision making is further augmented as well. All business logic is decided and required inputs serve to this for generating a targeted outcome. Usage of biometric authentication eliminated use of personal details for making any transaction. Security has been deployed with crypto landscape. With cost effective and secure system in place lending, crowd funding, investment portfolio has seen a multifold jump. Robotic process based customer follow up, advisories, lead generation and closure of leads could be observed. Investment opportunities and product innovation is benefitted through AI, Babinaet. al. (2024).

Opportunities of using AI in banking

Fintech companies have enabled banks to use AI through offering high end costly technology at affordable rates. The techniques have reshaped the banking scenario (Goncalves et. al., 2022). Investment management, Credit scoring, operational convenience and efficiency customer services have been benefitted using AI in banking (Narang et. al.). Deployment of huge cost for IT infrastructure and applications is eliminated with technological development in analytics, big data, consumer data protection, sensor based applications and multi factor authentication system. Current deployed setup is more prone & focused on data. Open platform make it easy and affordable to use applications with open architecture but at the same time offers threats. As more and more technical developments are happening on automation several chatbots, AI based apps are coming up in market which offer seamless flow of data in straight through processing manner. There is no human involvement and pure data & communication job. AI offers resolution of complex financial issues, technology uplift, intelligence in processes (Siau et. al. 2022). Advent of encryption made it possible to exchange data without intrusion. Secrecy is maintained for all transactions done on banking system through cryptography. Several protocols make system available up and running in service delivery system. High availability of operations keep failover arrangements to sustain activities. Key aspects of confidentiality, integrity and availability of data are maintained.

AI has potential to process bulky data in a short time. The cost involved in data storage and processing is very huge. AI has made this enable by offering specific decision making capabilities just like human mind. Cost, time, money is all saved. Dashboards provided to bank management makes it easy for them to formulate the products for customer as well as policies for better growth. Customer, bank interaction through chat bots and voice bots outreach bankers to their customers which is far beyond individual capacity of bank personnel. CBDC concept for digital currency is backed with the AI through sustainability, Obili (2024).

Fintech offerings for AI come with all regulatory compliances that comprise of signing and encrypted data transfer, integrity and immutability. Ghazal (2025) argues that such regulatory requirements also pose several challenges that require huge compute and availability with secure access. Rasiwala&Kohli (2021) emphasize the need for robotic advisory processes in development of digital currency framework are backed by block chain and distributed ledger technology. All communications are digitally signed and real time reconciled. As bankers receive data with tamper proof setup accuracy and genuineness of data is ensured. As we move forward digital personal data protection is mandated. Fintech integrate the AI capabilities to offer the banking e-KYC and fraud analytics. Several channels like cross border payments where settlement time is very large has been simplified through AI based message transmission and settlement. In order to ensure transaction setup of block chain where there is need for real time settlement and involves huge and bulky transaction base graphic processor units are used. Decentralized and distributed transaction traceability and reconciliation is ensured by Fintech applications in automated manner. Manta et. al. (2025) presented the transformation analysis that the AI and Fintechhas on banking payments.

Role of Internet of Things IOTs

Internet of Things (IoTs) connects several equipment and share data through embedded sensors. The data could be used for several tasks including personal details for banking and other purposes as well. Personal data sharing needs protection and at the same time also require huge setup for processing. The challenge of processing is resolved through data analytics. Data driven analytics and business intelligence generates financial wisdom for evolution of AI resear4ch in Fintech, (Cao, 2021). Customer data is highly complex and involves processing at various domains for rendering banking services. A close pattern of deposit holder is useful to offer term deposit products. Similarly a personal loan holder may be target for the other loan segments like home, vehicle, education etc. Such complexity of different portfolios and different segments rates could only be managed through correlation analysis that is possible through big data analytics, AI and predictive sampling etc. To generate a deeper insight to the data generated and processed by banks, it is imperative to analyze and process data as per MIS requirements of the various financial institutions. Aldasoro (2025) argue that as financial systems like banking have vast data coverage and segregated across geographic region, Fintech based AI may coordinate the resources requirements and utilization for the stakeholders. AI usage by Fintech is helpful to assist bank in managing banking operations.

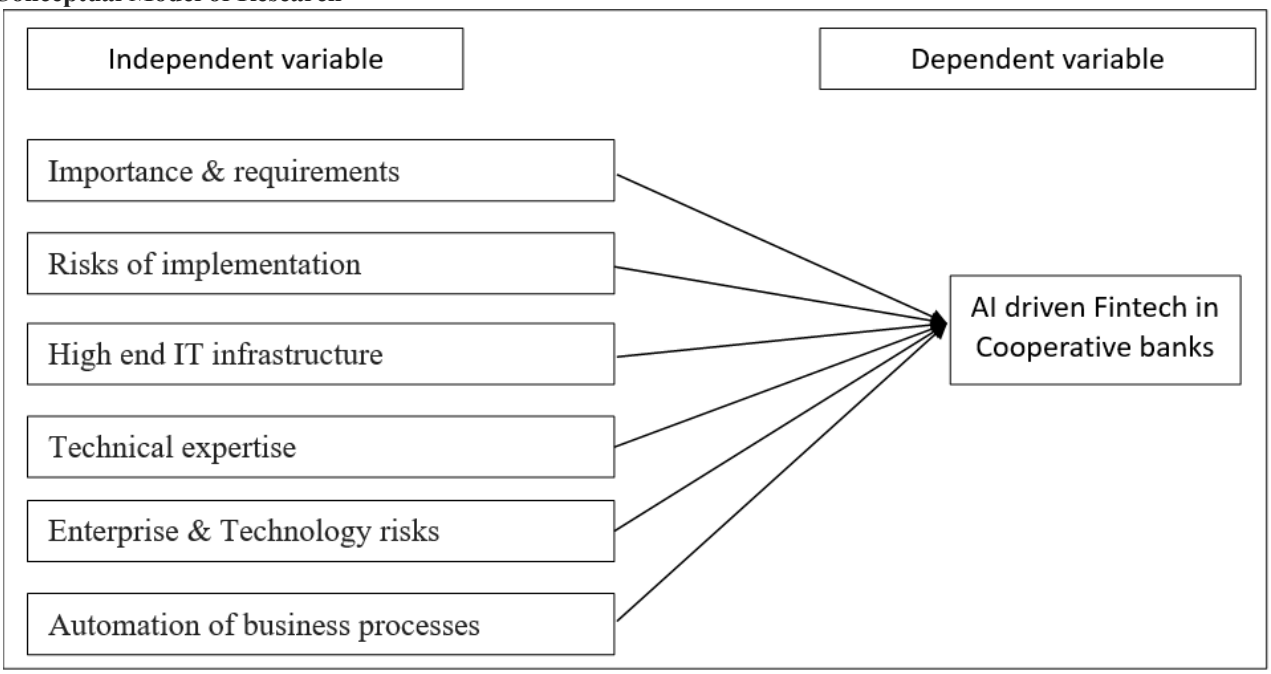
Gyauet. al. (2024) discusses that bank's analysis of loan and recovery illustrate that there is a need for monitoring non-performing assets. This is possible for bank to deploy AI based monitoring to assess real time posture. With development in technologies several

customer benefits have been also augmented. AI enabled the bankers to offer RFID or near field based transaction. With cryptography usage and tokenization identity theft could be prevented. Fraud detection and monitoring is important aspect which is a catalyst for the secure transaction system. An ease of access with geo location capability monitors precise transactions and cumbersome process methodology. AI enables data processing and backup with immutability and security setup. Banking personnel have safe and secure business setup for routine transactions.

Technology & Regulatory Framework

Information integrity, immutability and compliance to regulatory framework is mandatory for secure operations and banking is no exception to this. Regulators directions to offer safe, secure and in time banking operations could be fulfilled only with a robust infrastructure, continuous monitoring and technology upgrade. Vucinic&Luburic (2024) discuss the impact of the computers to think like humans while formulating business products for such upgrade. Algorithms in AI are so defined that any piece of data written is auto reconciled with the regulator MIS same way as humans do. This is a challenging journey as several banks across Indian sub-continent are using different software and are at different stage of technology adoption. AI in FIntech has put challenge before the banks to deploy automated process technology with caution. Processes like e-KYC automation, customer dealing may be handled in automated fashion (Bell et. al., 2025). Some have latest infrastructure while other use several decade old systems. A heterogeneous environment is a challenging scenario for the regulators itself to bring al to a common platform. Risk pertaining to Operations, Technology, Business, Cyber Security, Fraud etc. drives bankers to explore such solutions which could be relied on. AI offers the capability with a cost. But cost itself is a big factor behind not following regulator guidelines in totality. Technology offerings must be blend with cost optimization to fulfill the regulator compliances.

Conceptual Model of Research



Purpose & Objective of the research

1. To assess the importance & requirement of AI in Cooperative bank's fintech.
2. To identify the risks of implementation of AI in Cooperative banking sector.
3. To assess the requirement of high end IT infrastructure for AI based deployment in Cooperative banks.
4. To simulate the requirement of technical expertise for harnessing AI potential in Cooperative bank.
5. To assess enterprise & technology risks before deploying Ai in Cooperative banks.
6. To assess AI potential of automation of business processes in Cooperative banks.

Hypothesis:

Ho: Cooperative banks do not have requirement of AI in financial technology.

Ho: Cooperative bank management does not foresee any risk of AI in banking.

Ho: High end IT infrastructure is not required in Cooperative Banks to deploy AI based technology.

Ho: Cooperative banks do not require technical expertise to harness potential of AI in banking operations.

Ho: Enterprise and technology risks need not be assessed for AI deployment in cooperative banks.

Ho: AI does not automate business process to eliminate customer visit in branches.

Selection basis & Research Methodology

AI in Fintech for Cooperative banks is an opportunity that banks must adopt with a caution. In order to assess the opportunity as well as challenges a study was conducted among the Cooperative bank employee, service providers and management. Around 10000 employees are working for the Cooperative sector with an additional 2500 third party vendor staff. Cochran Sample size formula is used to calculate the sample size. For known population of 12500 employees the formula is $N0 = z^2 \times p \times (1-p) / e^2$

N0- sample size

z – z Score of confidence level, For 95% confidence level z score is 1.96.

p – Estimated proportion of population with the trait to be discovered (here 90%)

e – Margin of error i.e. tolerable limit of error - ± 5%

$N0 = (1.95)^2 \times 0.90 \times (1-0.90) / (.05)^2$

N0 = 137

Due to substantial size of population a sample of 150 staff was taken for conducting quantitative analysis. This is based on Google forms were designed to capture response of vendors regarding perception of AI in banking. Response regarding tools or services which could be augmented with AI was recorded. Present constraints in adopting high end technology was recorded along with risks of technological operations.

Results & Analysis

The results and findings are assessed based on descriptive statistics and Analysis of Variance (ANOVA).

Descriptive Analysis

Analysis Factor for AI in Cooperative bank's fintech.		Total	Count	Percentage
Assessment of importance & requirement	Yes	150	22	15%
	No		26	17%
	Maybe		102	68%
Identification of the risks of implementation	CBS BANCS24	150	1	1%
	Artificial Intelligence (AI)		28	19%
	Cloud Computing		125	83%
	Big Data Analysis		10	7%
Assessment of high end IT infrastructure.	High1	150	15	10%
	Very High		33	22%
	Medium		102	68%
Requirement of technical expertise for harnessing AI potential in Cooperative bank.	High1	150	20	13%
	Very High		29	19%
	Medium		101	67%
Assessment of enterprise & technology risks	Financial Decision making	150	126	84%
	Loan Process Automation		146	97%
	Quality Service Delivery;		127	85%
	Fraud Risk Management		119	79%
	Financial Decision making		126	84%
To assess AI potential of automation of business processes in Cooperative banks	Customer on boarding	150	72	48%
	Credit scoring		148	99%
	Customer support		98	65%
	Customer life cycle management		73	49%
	Risk management		145	97%

Hypothesis 1: Cooperative banks do not have requirement of AI in financial technology

Assessment of importance & requirement of AI based services

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	27.09	2	13.5467	83.0563	0.0000	3.0159
Within Groups	72.91	447	0.1631			
Total	100.00	449				

The *f*-ratio value is 83.0563. The *p*-value is < .00001.

The result is significant at $p < .05$.

Null Hypothesis rejected which indicates that cooperative banks do have a requirement of AI in financial technology.

Hypothesis 2: Cooperative bank management does not foresee any risk of AI in banking.

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	65.24	3	21.747	240.315	0.000	2.620
Within Groups	53.93	596	0.090			
Total	119.17	599				

The *f*-ratio value is 240.315. The *p*-value is < .00001.
The result is significant at $p < .05$.
Null Hypothesis rejected which indicates that cooperative banks does not foresee any risk of AI in banking.

Hypothesis 3: High end IT infrastructure is not required in Cooperative Banks to deploy AI based technology.

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	28.12	2	14.060	87.435	0.000	3.016
Within Groups	71.88	447	0.161			
Total	100	449				

The *f*-ratio value is 87.435. The *p*-value is < .00001.
The result is significant at $p < .05$.
Null Hypothesis rejected which indicates that High end IT infrastructure is required in Cooperative Banks to deploy AI based technology.

Hypothesis 4: Cooperative banks do not require technical expertise to harness potential of AI in banking operations

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	26.28	2	13.140	79.674	0.000	3.016
Within Groups	73.72	447	0.165			
Total	100	449				

The *f*-ratio value is 79.674. The *p*-value is < .00001.
The result is significant at $p < .05$.
Null Hypothesis rejected which indicates that Cooperative banks do require technical expertise to harness potential of AI in banking operations

Hypothesis 5: Enterprise and technology risks need not be assessed for AI deployment in cooperative banks.

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	2.74	4	0.685	5.778	0.000	2.384
Within Groups	88.28	745	0.118			
Total	91.02	749				

The *f*-ratio value is 5.778. The *p*-value is < .00001.
The result is significant at $p < .05$.
Null Hypothesis rejected which indicates that Enterprise and technology risks need to be assessed for AI deployment in cooperative banks

Hypothesis 6: AI does not automate business process to eliminate customer visit in branches.

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	37.24533	4	9.311	59.960	0.000	2.384
Within Groups	115.6933	745	0.155			
Total	152.9387	749				

The *f*-ratio value is 59.960. The *p*-value is < .00001.
The result is significant at $p < .05$.

Null Hypothesis rejected which indicates that AI automates business process to eliminate customer visit in branches

Significance & Implications

AI driven financial technology is a key enabler for the financial sector particularly banking sector. Such bankers in cooperative banks which are unaware of the AI and its potential may tend to believe that cooperative banks do not have requirement of AI in financial technology. This is however going to be a big challenge as with increase in the integrity requirements and digital penetration AI is must. An increase of cyber issues in financial system makes it mandatory for management to ponder about the AI privileges. The study results regarding AI based assessment reveals that AI is a mandatory requirement. AI based services assessment describe automation with a resultant aspect. Its importance cannot be overruled. As we see that AI based system are generally cloud oriented services there is risk factor involved. When we see cyber threats in AI space the system must be robust enough to manage and mitigate cyber risks. One of the key significance of the AI in financial services include deploying high end robust infrastructure. It is evident that this is a very costly affair. Cooperative banks which face a resource crunch need more focus on this. AI require high end technical experts to manage the operation to harness its real potential. AI implications are inevitable. Cooperative banks have to gear up for managing their systems to deploy AI.

Conclusion

Several business opportunities may be explored with innovative technique of AI. Dematerialized banking operations are one of them. It eliminates requirement to keep the hard copies and protect them. AI automates the operations to such an extent that there is no or minimal need to visit branches. The tasks are so automated and optimized that the customer benefits through a virtual environment thereby making services cheaper and faster.

Recommendations

AI has capability to offer fast, automatic, innovative and realistic business environment for cooperative banking sector. Back end processes of banks could be completed automatically in a fast matter. Machine learning experience can be deployed in banking to automate customer onboarding. This eliminates fraud & embezzlement arising out of non-fulfillment of KYC & other regulatory compliances. Trade finance module which is document intensive and requires validation of ownership, authentication, immutability and integrity could be benefitted through this deployment in Cooperative banks. Drones, GPS, e-surveillance contribute insurance sector particularly farm and non-farm sector. API sharing allows consumption of standard master records for processing thereby ensuring non redundant data setup and real time access to master data. Security fulfillment is definitely a major drawback which is cost consuming. With a calculated risk AI can be a boon for the banking sector.

Reference

1. Aldasoro I. (2024). Intelligent Financial System: how AI is transforming finance. Journal of financial stability, Vol.81.
2. Babina T., Fedyk A., He A. and Hodson J. (2024). Artificial Intelligence, firm growth and production innovation. Journal of financial economics. Vol.151. Elsevier.
3. Bell S., Gadanecz B., Gambacorta L., Cruz F.P. and Shreeti V. (2025). Artificial Intellefgice and Human capital, Bank for International Settlement.
4. Biallas M. and O'Neill F. (2020). Artificial Innovation in Financial Services. International Financial Corporation, World Bank Group.
5. Cao L. (2021). AI in Finance : Challenges, Techniques and Opportunities, Vol.1(1), University of Technology, Sydney, Australia.
6. GangulyArnab and ArcotPurnaprasad. (2024). Artificial Intelligence as a driver of Fintech: Interesting Applications. International Journal for Multidisciplinary Research. Vol.6 (5). pp.2-3
7. Ghazal I. (2025). Global Regulatory Challenges of AI in fintech. International Journal for multidisciplinary research. Vol.7(1)
8. Goncalves A.R., Meira A.B., Shuqair S. and Pinto D.C. (2022). Artificial intelligence in fintech decisions. Emerald International Journal of Bank marketing.
9. Gyau E.B., Appiah M., Gyamfi E.A., Achie T. and Naeem M.A. (2024). Transforming banking; Examining role of AI technology innovation in boosting banks financial performance. International review of Financial Analysis. Vol. 96(B).
10. Hoyer W.D., Kroschke M., and Shankar V. (2022). Transforming the customer experience through new technologies. Journal of Interactive marketing Vol.51 (1).
11. Kou G. and Lou Y., (2025). Fintech: a literature review of emerging financial technologies and applications. Financial Innovation Vol. 11(1), Springer nature.
12. Lam, Albert. (2025). Artificial Intelligence Applications in Financial Technology. Journal of Theoretical and Applied Electronic Commerce Research. 20. 29. 10.3390/jtaer20010029.
13. Manta O., Vasile V. and Rusu E. (2025). Banking transformation through fintech and integration of AI in payments. MDPI Fintech, Vol.4(2).
14. Narang, Ashima&Vashisht, Priyanka &Bhaskar, Shalini. (2024). Artificial Intelligence in Banking and Finance. International Journal of Innovative Research in Computer Science and Technology. 12. 130-134. 10.55524/ijircst.2024.12.2.23.
15. Ozili P.K. (2024). Artificial Intelligence and CBDC. IGI Global. pp.117-125.
16. Rasiwala F S. and Kohli B. (2021). AI in fintech. International Journal of business intelligence research. Vol.12(1). pp48-65

17. Saiyed, Asifiqbal. (2025). AI-Driven Innovations in Fintech: Applications, Challenges, and Future Trends. International Journal of Electrical and Computer Engineering Research. 5. 8-15. 10.53375/ijecer.2025.437.
18. Sharma Vivek &PriyaBhanu. (2025). Bridging the Gap: AI powered fintech and its impact on financial inclusion and financial well-being. Springer Nature. Vol.5 Article 290.
19. Siau, Keng&Fui, Fiona & Nah, Hoon&Qian, Yuzhou&Eschenbrenner, Brenda & Chen, Langtao. (2022). Artificial Intelligence in Financial Technology. Annual conference of Information Management, China.
20. Vucinic M. and Luburic R.(2024). Artificial intelligence, Fintech and Challenges to Central Banks. Central Bank of Montegro, Vol. 13(3). pp.5-42.