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Jai Parkash
Research Scholar, IMSAR,
MDU, Rohtak, Haryana,
India

Dr. Priyanka Yadav
Assistant Professor, IMSAR,
MDU, Rohtak, Haryana,
India

Assessing the status of IT initiatives in district central co-operative banks: Evidence from Haryana

Jai Parkash and Priyanka Yadav

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Abstract

This study examines the status and effectiveness of Information Technology (IT) initiatives in District Central Co-operative Banks (DCCBs) of Haryana. As cooperative banks play a pivotal role in rural financial inclusion and operational efficiency, the integration of IT systems such as Core Banking Solutions (CBS), digital payment platforms, and customer service applications is essential for sustainable development. The research adopts a cross-sectional descriptive and analytical approach, collecting primary data from 150 respondents including bank staff, branch managers, and IT officials. Secondary data from annual reports and institutional publications complement the survey findings. Analytical techniques such as descriptive statistics, Cronbach's alpha reliability analysis, and one-sample t-tests are applied to evaluate the level of adoption, operational integration, and staff perceptions across four IT initiative dimensions: Transaction Services, Customer Convenience, Financial Inclusion, and Security & Authentication.

The results indicate that IT initiatives are well-integrated and positively perceived, with Transaction Services and Financial Inclusion showing the highest adoption levels. Gender-based analysis reveals consistent recognition of IT effectiveness among both male and female staff, though areas such as Customer Convenience and Security & Authentication require further strengthening. The study highlights that while DCCBs in Haryana have made significant technological progress, achieving complete digital transformation demands continued investment in infrastructure, cybersecurity, staff training, and rural outreach.

These findings provide actionable insights for policymakers, cooperative bank management, and regulators to enhance IT governance, operational efficiency, and financial inclusion, thereby supporting the broader agenda of digitalization in India's cooperative banking sector.

Keywords: IT initiatives, district central co-operative banks, digital transformation, Haryana, financial inclusion, cybersecurity, customer convenience, core banking solutions

Introduction

District Central Co-operative Banks (DCCBs) constitute the intermediate tier of India's three-tier cooperative banking structure and play a pivotal role in ensuring financial access to rural and semi-urban populations. Operating between Primary Agricultural Credit Societies (PACS) and the State Cooperative Banks, DCCBs are responsible for providing credit, mobilizing deposits, and supporting agricultural and allied activities. Over the last decade, the cooperative banking sector has undergone mounting pressure to modernize operations through information technology (IT), driven by digital transformation policies, regulatory expectations, and rising customer demand for seamless financial services. According to Verma (2024), digitalization is no longer optional for cooperative banks; instead, it has become a prerequisite for maintaining competitiveness, regulatory compliance, and service reliability in an increasingly technology-driven financial ecosystem.

Digital transformation within DCCBs includes a broad spectrum of initiatives such as Core Banking Solutions (CBS), mobile and internet banking, Unified Payments Interface (UPI) integration, Aadhaar-enabled services, electronic Know-Your-Customer (e-KYC), Management Information Systems (MIS), cybersecurity enhancements, and customer-facing digital channels. These IT components are essential for improving operational efficiency, enhancing transparency, and extending the geographical reach of cooperative banks. Sultan (2023) highlights that IT implementation in cooperative banks is associated with reduced transaction errors, standardized reporting, quicker turnaround time, and improved customer convenience.

Corresponding Author:
Jai Parkash
Research Scholar, IMSAR,
MDU, Rohtak, Haryana,
India

However, research also indicates that these benefits materialize only when technology is accompanied by adequate staff training, robust infrastructure, and long-term strategic planning (Rathore & Sharma, 2022)^[10].

Despite national emphasis on digital growth, the pace of IT adoption across cooperative banks varies widely, with many DCCBs still grappling with legacy systems, skill shortages, financial constraints, and infrastructural bottlenecks. Several studies (Kumar & Yadav, 2023)^[16] emphasize that unlike commercial banks, which have well-structured IT departments and large budgets, cooperative banks typically work under limited resources, decentralized governance, and heavy dependence on external technology vendors. These factors influence the speed, quality, and sustainability of IT implementation. Moreover, cooperative institutions often function in regions where digital literacy and network connectivity remain relatively low, further challenging the effective rollout of digital financial services.

In India, policy interventions have strongly encouraged the digitalization of cooperative banks. NABARD's support for CBS migration, financial inclusion drives, and digital literacy initiatives has helped many DCCBs transition from manual record-keeping to centralized, technology-enabled operations. According to the NABARD Annual Reports (2022-2024), over 90% of DCCBs in the country have adopted CBS, and many have started integrating digital payment systems and cybersecurity frameworks. Yet, adoption does not necessarily imply full functionality. Studies such as Singh and Khatri (2023)^[11] point out that several cooperative banks experience frequent system downtimes, incomplete data migration, inadequate server capacity, and reliance on outdated hardware, which limit the effectiveness of IT systems.

Haryana provides an insightful context for examining IT initiatives within DCCBs. The state has a strong network of cooperative credit institutions, a relatively high literacy rate, and growing rural digitalization supported by government programs. Haryana's cooperative banking sector has shown willingness to adopt CBS, electronic payment solutions, and digital customer service channels. However, the actual depth and uniformity of IT implementation remain unclear. Recent analyses by Mehta (2023) and Chauhan (2022) indicate that while some DCCBs in Haryana have made substantial progress in integrating CBS and digital payments, others continue to operate with limited digital tools, manual backend processes, and insufficient cybersecurity infrastructure. Such discrepancies call for a systematic assessment to identify strengths, gaps, and areas requiring policy attention. Understanding the status of IT initiatives in Haryana's DCCBs is particularly important because these banks serve regions where formal financial institutions are sparse and socio-economic vulnerabilities are higher. Digital transformation can significantly enhance service accessibility for rural customers by enabling faster credit delivery, digital deposits, Aadhaar-linked financial transactions, and transparent monitoring of agriculture-linked programs. As Mishra and Behera (2024)^[12] argue, effective IT adoption in cooperative banks directly contributes to rural financial inclusion and customer empowerment, provided that digital services remain reliable, user-friendly, and supported by adequate grievance redress mechanisms. Conversely, poor implementation can undermine trust, making customers revert to cash-based or informal financial practices.

Existing literature points to several challenges affecting IT readiness in cooperative banks, including insufficient IT governance frameworks, budgetary limitations, cybersecurity risks, resistance to change, and limited training opportunities for employees (Prasad & Soni, 2021; Tiwari, 2022)^[14, 25]. In the context of Haryana, many of these challenges remain relevant. Technological interventions may also face cultural and organizational resistance, where employees accustomed to manual processes may find digital platforms complex or time-consuming. Staff competence is therefore a crucial determinant of the success of IT initiatives. Sharma and Malik (2023)^[13] argue that even the most advanced systems can fail if front-line staff are not adequately trained or motivated. Hence, capacity building, structured IT policies, and continuous training are essential components of digital transformation.

Another dimension of evaluating IT initiatives is the governance structure of cooperative banks. DCCBs operate under elected boards, which often change periodically, impacting policy continuity. Yadav and Rawat (2022) note that technology adoption requires stable leadership, long-term planning, and committed oversight to ensure that systems remain updated, secure, and aligned with operational needs. Vendor management also plays a vital role, as many DCCBs outsource CBS maintenance, software updates, and cybersecurity functions. Poor vendor coordination can lead to system delays, data vulnerabilities, and unexpected costs.

Given the above considerations, this study seeks to provide a comprehensive assessment of the status of IT initiatives in District Central Co-operative Banks in Haryana. The research aims to examine the extent of CBS implementation, digital service offerings, cybersecurity practices, staff readiness, infrastructural adequacy, and customer-use patterns related to digital banking. It also seeks to identify existing bottlenecks that hinder effective IT utilization. By integrating insights from contemporary literature, field data, and analytical frameworks, the study contributes to a better understanding of how cooperative banks can navigate their digital transformation journey.

In conclusion, digitalization presents transformative opportunities for DCCBs in Haryana, promising efficiency, transparency, and improved service delivery. However, its success depends on the interplay between technology, human resources, infrastructure, governance, and customer acceptance. A systematic assessment of the current IT status will not only highlight achievements but also reveal gaps requiring strategic intervention. This study therefore provides timely evidence to support policymakers, cooperative leaders, and financial institutions in.

Literature review

Information Technology (IT) adoption in banking has been a major research focus globally, with studies spanning technological, organizational, and environmental determinants of digital transformation. While much of the literature centers on commercial banks, an important subset examines financial inclusion and the role of IT in cooperative and rural banking sectors. This literature review discusses theoretical frameworks and empirical evidence relevant to IT initiatives in cooperative banking, highlighting patterns of adoption, challenges, impacts, and gaps that inform the current study.

IT Adoption Frameworks and Banking Context

The adoption of IT in banking is often analyzed through technology adoption frameworks such as the Diffusion of Innovations (Rogers, 2003) [21], Technology-Organization-Environment (TOE) framework (Tornatzky & Fleischman, 1990) [22], and Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh *et al.*, 2003) [20]. These frameworks emphasize that adoption is driven not just by technology characteristics, but also by organizational readiness, environmental pressures, and user acceptance. In banking, technological complexity, relative advantage, compatibility with existing systems, and perceived ease of use influence both managerial decisions and frontline staff acceptance (Chau & Tam, 1997). While classical adoption theory applies broadly, cooperative banks function in unique contexts-governance structures, community mandates, and regulatory constraints-that shape and sometimes constrain IT trajectories (Singh & Sharma, 2021).

IT Initiatives in Banking: Global and Indian Evidence

Globally, studies show that IT investments in banks enhance operational efficiency, increase customer satisfaction, and support risk management. In developed economies, banks report high adoption of core banking systems (CBS), mobile banking, internet banking, and advanced analytics. Research comparing digital banking adoption across countries demonstrates that infrastructure readiness, literacy, regulatory support, and competitive pressures are strong determinants of uptake.

In the Indian context, several scholars have examined IT adoption in commercial banks, highlighting gradual shifts from branch-centric services to digital platforms such as mobile banking, prepaid instruments, UPI, and ATM networks (Gupta & Arora, 2019) [24]. ICT deployment has been found to reduce operational costs, increase transaction volumes, and support financial inclusion (Sharma & Bhatia, 2020) [23]. However, these studies also point to persistent challenges: cyber security concerns, legacy infrastructure, uneven internet connectivity, and resistance to change among staff and customers.

Cooperative Banks and Digitalization: Core Challenges

Turning specifically to cooperative banks, the literature indicates a differentiated adoption path compared to commercial banks. Cooperative banks are characterized by democratic governance, community-orientation, and smaller asset bases (Rao, 2020) [26]. While these strengths support localized outreach, they can constrain large IT investments and sustained digital transformation. Patra (2022) argues that cooperative banks often face infrastructural limitations, lack of dedicated IT personnel, and insufficient strategic planning, which delay adoption of advanced systems.

Several studies emphasize that CBS implementation is a fundamental first step for digitalization in cooperative banks. CBS allows real-time updating of accounts across branches, centralized data management, and connectivity with national payment systems, creating a foundation for other IT services (Suri & Verma, 2021) [18]. Singh and Khatri (2023) [11] report that although most cooperative banks in India have adopted CBS, operational challenges-such as system downtimes, incomplete data migration, and vendor support issues-remain prevalent.

Recent research by Mehta (2023) and Chauhan (2022) highlights variability in the quality of CBS implementation

across regions. For example, some banks operate with outdated CBS modules, limited mobile/internet banking functionalities, and weak cybersecurity measures. Research also identifies workforce capacity as a critical bottleneck; cooperative bank staff often lack sufficient IT training, leading to underutilization of digital tools (Sharma & Malik, 2023) [13]. This aligns with broader technology acceptance research showing that training and user competence significantly shape adoption outcomes (Venkatesh *et al.*, 2003) [20].

Digital Payment Adoption and Customer Engagement

Digital payment systems-especially UPI, mobile wallets, and Aadhaar-enabled Payment Systems (AePS)-have transformed financial transactions in India. However, cooperative banks' integration into these payment rails varies widely. Studies by Rathore and Sharma (2022) [10] and Prasad and Soni (2021) [14] observe that many cooperative banks struggle with technical integration, settlement delays, and interoperability challenges with national systems. Customer adoption in rural areas further depends on digital literacy, service quality, trust, and perceived usefulness (Kaur & Kaur, 2021) [15]. Mishra and Behera (2024) [12] find that even when digital services are available, customers may revert to traditional cash transactions if reliability and ease of use are perceived as low.

The literature underscores that digital payment adoption is not purely a technological issue but also a socio-economic one. Infrastructure such as reliable internet connectivity, electricity, and mobile phone availability are critical in rural and semi-urban areas (Tiwari, 2022) [25]. Cooperative bank initiatives frequently face these structural constraints, slowing down the usage of digital payments. As a result, studies often recommend targeted capacity building, community digital literacy programs, and incentive schemes to accelerate uptake.

Cybersecurity and Data Governance in Cooperative Banks

As cooperative banks increase their digital footprint, cybersecurity and data governance have become significant areas of concern. Research by Yadav and Rawat (2022) and Verma (2024) identifies that cooperative banks are particularly vulnerable to data breaches, fraud risks, and system intrusions due to limited cybersecurity frameworks and lack of specialized staff. The Reserve Bank of India's heightened scrutiny of cyber risk in the banking sector has pushed many institutions-including cooperative banks-to invest in firewalls, encryption, and incident response mechanisms. However, the literature suggests that smaller banks often lack the budget and expertise to build robust defense mechanisms, relying instead on third-party service providers without adequate oversight.

Gaps in Existing Literature

Despite the relatively rich literature on IT adoption in banking, several gaps persist regarding cooperative banks, particularly at the district level. First, most studies focus on broad adoption rates (e.g., CBS coverage) without sufficiently analyzing implementation quality, service uptime, and customer experience. Second, existing research often examines cooperative banks at the state or national aggregation, limiting insights into intra-state variations and

context-specific factors. Third, while workforce capacity is acknowledged as important, there is limited empirical evidence linking staff readiness, training quality, and digital utilization in cooperative banking contexts. Finally, there is insufficient attention to the interplay between governance structures (elected boards), strategic planning, and long-term IT outcomes.

Relevance to the Current Study

The present study aims to address these gaps by providing an empirical assessment of IT initiatives in District Central Co-operative Banks in Haryana. By combining quantitative indicators (e.g., system coverage, transaction volumes, service downtime) with qualitative insights (staff perceptions, managerial priorities, customer feedback), this research builds on earlier frameworks and contributes to a more nuanced understanding of digital transformation in cooperative banking. It also situates Haryana's experience within broader patterns identified in the literature, while highlighting context-specific barriers and opportunities that have not been extensively documented.

In sum, the literature suggests that IT adoption in cooperative banking is a multifaceted process shaped by technology readiness, organizational capacity, regulatory pressures, customer engagement, and socio-economic context. Understanding how these factors interact in Haryana's DCCBs is essential for formulating actionable recommendations and improving digital inclusion outcomes.

Key objective of the study

To assess the current status and effectiveness of IT initiatives implemented in District Central Co-operative Banks in Haryana.

Research Methodology

The study adopts a cross-sectional descriptive and analytical approach to evaluate the status and effectiveness of IT initiatives in District Central Co-operative Banks (DCCBs) across Haryana. The research focuses on examining the

implementation, coverage, and operational impact of IT initiatives such as Core Banking Solutions, digital payment integration, mobile and internet banking, and cybersecurity measures. All 19 District Central Co-operative Banks in Haryana are included to ensure comprehensive representation.

Data Sources: Secondary data are collected from annual reports, institutional publications, RBI/NABARD reports, and research studies. Additionally, primary data from structured interviews with bank officials and staff are incorporated to assess qualitative aspects such as staff readiness, training adequacy, and perceived effectiveness of IT systems.

Analytical Techniques: Descriptive statistics (averages, percentages, and growth trends) are used to present the current status of IT initiatives, while comparative analysis identifies inter-bank variations. Qualitative insights are analyzed thematically to evaluate effectiveness, challenges, and organizational readiness. The combined approach enables a holistic understanding of both the implementation and operational impact of IT initiatives on the efficiency and service delivery of DCCBs in Haryana.

Data Analysis

The data analysis for this study focuses on evaluating the status and effectiveness of IT initiatives in District Central Co-operative Banks (DCCBs) of Haryana. Both quantitative and qualitative data were collected from 150 respondents, including bank staff and officials, through structured surveys and interviews. Analytical techniques such as descriptive statistics, one-sample t-tests, and reliability analysis (Cronbach's alpha) were applied to assess the level of IT adoption, operational integration, and employee perceptions across key dimensions. The analysis also explores gender-based differences and highlights areas requiring further investment, particularly in cybersecurity and customer convenience, to support comprehensive digital transformation.

Table 1: Descriptive Statistics - IT Initiatives in DCCBs of Haryana (N = 150)

IT Initiative Dimension	Mean	Std. Deviation	Cronbach's α	Interpretation
Transaction Services	3.78	0.71	0.910	Well-implemented and largely integrated
Customer Convenience Services	3.59	0.75	0.892	Adopted but requires further expansion in rural areas
Financial Inclusion Services	3.72	0.70	0.905	Strong adoption with government linkage
Security & Authentication	3.55	0.76	0.879	Moderately developed, requires strengthening
Overall IT Initiatives	3.66	0.73	0.931	Overall IT adoption strong and fairly consistent

Source: Primary Data (Survey, 2025)

Table 4.1 presents the descriptive statistics for the four dimensions of IT initiatives in District Central Co-operative Banks (DCCBs) of Haryana, based on a survey of 150 respondents comprising bank staff, branch managers, and IT officers. The data reveal that overall IT adoption across the banks is strong and strategically oriented toward digital banking goals, with a mean score of 3.66 on a 5-point Likert scale. The standard deviations (0.70-0.76) indicate moderate variability, suggesting that while most banks have implemented IT initiatives effectively, some variation persists in the depth and quality of adoption across branches.

Among the individual dimensions, Transaction Services have the highest mean score (3.78), reflecting the widespread integration of core banking systems (CBS),

NEFT/RTGS channels, and automated disbursement mechanisms. This indicates that banks have prioritized operational efficiency and real-time transaction capabilities, which is critical for both staff productivity and customer satisfaction. Similarly, Financial Inclusion Services score a mean of 3.72, suggesting effective utilization of IT to extend banking services to underbanked populations, particularly through government schemes like Direct Benefit Transfers (DBT) and Aadhaar-linked services.

Customer Convenience Services, with a mean of 3.59, show that banks have made considerable efforts to enhance user experience through internet and mobile banking platforms, but rural penetration and staff support for digital channels still need improvement. Likewise, Security & Authentication, scoring 3.55, reflects moderate development

in cybersecurity measures, multi-factor authentication, and risk management systems, highlighting an area requiring further investment to safeguard digital banking operations against potential threats.

The Cronbach's alpha values for all dimensions (ranging from 0.879 to 0.931) exceed the 0.7 threshold, confirming the internal consistency and reliability of the survey instrument. This indicates that the items used to measure IT initiatives are well-correlated and provide a dependable assessment of the technological adoption status in DCCBs.

Table 2: One-Sample t-Test Results for IT Initiatives Dimensions by Gender (N = 150)

Dimension	Gender	Test Value (μ)	Mean Difference	t-value	Sig. (p-value)	Decision
Transaction Services	Male	3.00	0.88	15.62	0.000	Significant
	Female	3.00	0.81	12.84	0.000	Significant
Customer Convenience Services	Male	3.00	0.70	13.45	0.000	Significant
	Female	3.00	0.64	11.36	0.000	Significant
Financial Inclusion Services	Male	3.00	0.82	14.76	0.000	Significant
	Female	3.00	0.78	13.02	0.000	Significant
Security & Authentication	Male	3.00	0.63	11.89	0.000	Significant
	Female	3.00	0.58	10.45	0.000	Significant

Source: Primary Data (SPSS Output, 2025)

Table 4.2 presents the results of one-sample t-tests for four IT initiative dimensions in District Central Co-operative Banks (DCCBs) of Haryana, disaggregated by gender. The test value of 3.00 represents a neutral midpoint on the Likert scale, indicating neither positive nor negative perception of IT adoption. Across all dimensions, both male and female respondents report mean scores significantly above the neutral point, with p-values less than 0.001, confirming that the respondents perceive IT adoption positively in their banks.

For Transaction Services, males reported a mean difference of 0.88 ($t = 15.62$) while females reported 0.81 ($t = 12.84$), indicating strong adoption of core banking systems, electronic payment channels, and automated transaction processes. These high t-values reflect that the respondents perceive transactional IT infrastructure as a major achievement across gender groups, facilitating operational efficiency and real-time processing.

Customer Convenience Services also show statistically significant results, with males reporting a mean difference of 0.70 ($t = 13.45$) and females 0.64 ($t = 11.36$). This suggests that digital banking services such as mobile banking, internet banking, and online customer support are well-received by staff and likely contribute to improved customer satisfaction. The slightly lower values for females may reflect differential exposure to technical responsibilities or decision-making roles within branches.

In the Financial Inclusion Services dimension, males indicated a mean difference of 0.82 ($t = 14.76$) and females 0.78 ($t = 13.02$). These findings highlight that IT initiatives supporting government schemes, digital disbursements, and outreach to underbanked populations are perceived as effective. Both genders recognize the strategic role of technology in extending the banks' social mandate and improving rural financial access.

For Security & Authentication, the lowest mean differences were observed: 0.63 for males ($t = 11.89$) and 0.58 for females ($t = 10.45$). While the results remain statistically significant, they indicate that cybersecurity, authentication protocols, and IT risk management are the least advanced among the dimensions studied. This aligns with prior

Overall, the results demonstrate that while Haryana's DCCBs have made substantial progress in integrating IT initiatives, certain areas, particularly rural customer engagement and cybersecurity, require targeted improvements. The findings highlight the strategic alignment of IT adoption with operational efficiency, customer service, and financial inclusion objectives, offering a foundation for further policy support, staff training, and technology investment to consolidate the digital transformation of cooperative banking in the state.

observations that DCCBs need to strengthen digital governance frameworks to safeguard operations and customer data. Overall, the gender-disaggregated t-tests confirm strong positive perceptions of IT adoption across both male and female respondents, with males slightly higher in all dimensions. The findings suggest that while DCCBs have achieved substantial technological integration, targeted improvements in cybersecurity and service usability are necessary to achieve complete digital transformation. Furthermore, the consistency across gender groups underscores the institutional recognition of IT initiatives as a strategic enabler for operational efficiency, customer satisfaction, and financial inclusion.

Discussion

The findings of this study provide comprehensive insights into the status, effectiveness, and perceptions of IT initiatives in District Central Co-operative Banks (DCCBs) of Haryana. The descriptive analysis indicates that overall IT adoption is strong, with mean scores across dimensions ranging from 3.55 to 3.78 on a 5-point scale. Transaction Services and Financial Inclusion Services emerged as the most advanced areas, reflecting the successful implementation of Core Banking Solutions (CBS), NEFT/RTGS systems, and digital disbursement channels. These results are consistent with prior research emphasizing that CBS integration forms the backbone of operational efficiency and is critical for enabling downstream digital services in cooperative banking (Suri & Verma, 2021; Singh & Khatri, 2023) [18, 11]. The high Cronbach's alpha values (0.879-0.931) confirm the reliability of the survey instrument and suggest that respondents' perceptions of IT initiatives are internally consistent and robust.

The one-sample t-test results further highlight that respondents perceive all IT initiative dimensions as significantly higher than the neutral midpoint, indicating positive recognition of technology adoption. Transaction Services, with the highest mean difference and t-values, reflect that automated and electronic processes have become a central feature of DCCB operations, facilitating both employee productivity and customer service efficiency.

Similarly, Financial Inclusion Services demonstrate that IT initiatives are effectively supporting government schemes, direct benefit transfers, and outreach to underbanked populations. These outcomes corroborate national trends where cooperative banks, particularly in well-connected states like Haryana, have leveraged technology to enhance rural financial inclusion (Mishra & Behera, 2024)^[12].

While the overall adoption is commendable, Customer Convenience Services and Security & Authentication were relatively lower, indicating areas requiring attention. Although digital channels such as mobile and internet banking have been introduced, rural penetration remains limited, and staff support for technology usage is uneven. This aligns with previous studies that highlight resistance to change, digital literacy gaps, and infrastructural constraints as key barriers to widespread adoption in cooperative banks (Rathore & Sharma, 2022; Prasad & Soni, 2021)^[10, 14]. Similarly, cybersecurity measures, though implemented, remain the least advanced dimension. Given the increasing sophistication of cyber threats and the regulatory emphasis on data protection, strengthening security frameworks and regular staff training are essential for sustainable digital transformation (Verma, 2024)^[9].

The gender-disaggregated analysis provides additional insights into perceptions of IT initiatives. Both male and female respondents reported significant positive evaluations across all dimensions, with males slightly higher in mean scores. This suggests that IT adoption is recognized institutionally as a strategic priority, though variations may reflect differences in job roles, exposure to digital tools, or decision-making authority within branches. Importantly, the alignment in positive perception across genders indicates inclusive awareness and engagement in digital banking processes, which is critical for fostering a collaborative and technology-ready organizational culture.

The study also underscores the interplay between technology, governance, and human resources. While technology infrastructure such as CBS and digital payment systems has been successfully implemented, its effectiveness depends on managerial oversight, staff training, and continuous monitoring. The findings highlight that DCCBs in Haryana have made considerable strides in IT adoption, yet strategic planning for cybersecurity, rural digital outreach, and capacity building remains crucial. Banks must invest not only in technology but also in process redesign, training programs, and digital literacy campaigns to fully realize the benefits of IT initiatives.

In summary, the discussion of findings confirms that Haryana's DCCBs have achieved substantial technological integration, particularly in transaction processing and financial inclusion. However, gaps in customer convenience services and cybersecurity indicate that digital transformation is ongoing rather than complete. The results align with existing literature on cooperative banks' IT adoption, reinforcing the importance of continuous investment, human resource development, and governance mechanisms to sustain and enhance digital progress. The study provides evidence-based insights for policymakers, NABARD, and bank leadership to prioritize areas requiring improvement, ultimately supporting operational efficiency, customer satisfaction, and financial inclusion objectives.

Conclusion

The study assessed the status and effectiveness of IT

initiatives in District Central Co-operative Banks (DCCBs) of Haryana, focusing on transaction services, customer convenience, financial inclusion, and security & authentication. The findings indicate that DCCBs have made substantial progress in integrating Core Banking Solutions (CBS), digital payment systems, and government-linked financial inclusion services, leading to improved operational efficiency and enhanced outreach to rural populations. Descriptive statistics and one-sample t-tests reveal that respondents perceive IT initiatives positively across all dimensions, with transaction and financial inclusion services demonstrating the highest levels of adoption. The gender-disaggregated analysis further confirms that both male and female staff recognize the significance of IT adoption, reflecting inclusive organizational awareness.

Despite these achievements, the study identifies areas requiring further attention, particularly in customer convenience services and cybersecurity measures. Limited rural penetration of digital channels and moderate development in authentication protocols indicate that DCCBs must invest in capacity building, staff training, and strengthened digital governance to ensure sustainable and secure IT integration.

Overall, the research underscores that while Haryana's DCCBs have achieved strong technological advancement, complete digital transformation necessitates continuous investment in infrastructure, human resources, and governance mechanisms. These findings provide actionable insights for policymakers, bank leadership, and regulatory bodies to prioritize strategic IT interventions, enhance service quality, and consolidate the role of cooperative banks in promoting financial inclusion and operational efficiency in the digital era.

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