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Artificial Intelligence, Automation and Workforce Productivity in Digital Banking Organisations

Nadindla Jayasree
*(Department of Public.Administration & HRM, Kakatiya University, Warangal, Telangana
Email: Njayasreemhrm@gmail.com)

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Abstract:

Artificial intelligence (AI) and automation are transforming how Indian banks serve their customers, evaluate credit, monitor transactions, and organise employees. However, the growth of digital banking does not necessarily indicate increased employee productivity. This study focuses on AI-enabled automation and workforce productivity in Indian banking organisations from an HRM perspective. It uses a qualitative secondary research design and synthesises peer-reviewed studies, Reserve Bank of India (RBI) publications, official payment statistics and disclosures of select banks. This review explains the differences between digital efficiency at the institutional level, AI assistance at the task level and employee performance. Existing evidence shows that digitalisation is positively linked to increased bank efficiency and AI assistance can enhance specific work tasks. Meanwhile, workforce adaptability and technology appropriation are important conditions for the flourishing of Indian banking. Bank disclosures show how AI has been implemented in practice but provide little independently verified evidence of how much the technology contributes to employee productivity. Challenges include misaligned skills, algorithmic errors, employee anxiety and privacy and governance issues. This article advocates a human-centred approach where task redesign, workforce capability and responsible oversight collectively determine whether automation generates sustained value. It recommends training for specific roles, performance measures of quality and thorough evaluations of deployments. The results are interpretative and not measures of causal effects.

Keywords — **Artificial Intelligence, Automation, Workforce Productivity, Digital Banking, Human Resource Management, Indian Banks, Workforce Agility.**

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I. INTRODUCTION

A. Background and Context

The Indian banking scenario has shifted from branch-centricity to an integrated digital ecosystem comprising core banking systems, mobile apps, electronic KYC, real-time payments and digital lending services. This change impacts the scale of banking services and the activities of employees. According to the Ministry of Finance (2026), the total number of retail digital payment transactions in 2024–25 stood at 22,167.90 crore as against a volume of 16,416.02 crore in 2023–24 a growth of 35.04%. In 2024–25, the Unified Payments Interface (UPI) accounted for about 81% of all digital payment transactions. These data show a considerable amount of digital activity but this does not translate into better productivity by an individual or the organisation.

Digitalisation is just one of the many capabilities of artificial intelligence. Machine learning systems can be deployed to detect patterns in data and highlight suspicious transactions. Natural language tools can retrieve information and draft responses, while predictive data analytics can assist in risk assessment. In contrast, robotic process automation runs predefined and repetitive processes. Although

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these tools may be integrated, they should not be regarded as the same technologies or substitutes for all professional judgment. It is the employee who handles complex complaints, exceptions, ethics and contextual decision-making.

Banking workforce productivity goes beyond the number of transactions processed per employee. It involves achieving results in a timely manner with the available labour. Digital systems allow workers to use technology for clerical tasks. However, they also increase responsibilities in data interpretation, validation, relationship management, and technology oversight. Understanding this redistribution of work in India is crucial. In the evolving digital ecosystem, banks have customers who speak different languages, live in various locations, and possess varying levels of digital literacy.

B. Research Objectives

This study had four purposes.

1. To investigate the uptake and usage of AI and automation in Indian banks
2. To assess the published evidence associated with productivity at the workplace.
3. The aim of this study is to identify the roles of skills, employee attitudes and human resource management practices.
4. To suggest encouraging strategies for improving work outcomes.

The main question of the study is: What are the organisational and workforce conditions within which AI and automation lead to productivity gains in Indian digital banking organisations? The questions supporting the study look at differences in various banking functions, barriers to adoption, and measuring benefits without hampering quality and protection.

C. Importance of the Study

Managers must decide where to use technology. Anyone involved in financial services will find it equally important for data to comply with regulations and be used responsibly. Productivity claims affect staffing, recruitment, budgets, and performance targets in a workplace context. Therefore, careful examination and consideration by competent authorities are warranted. This study provides a comprehensive perspective linking bank-level efficiency research with employee-level factors and actual disclosures of banks in India. The increase in automated transactions does not necessarily imply an improvement in human performance, as is commonly stated in promotional accounts, but this can be misleading.

This study focuses on financial inclusion in the Indian context. At smaller centres, customers with authentication issues, unfamiliar applications, and disputed transactions consume a significant amount of employees' time. While automation can reduce standard processing, the need for patient and context-sensitive support will remain substantial. A productivity appraisal that examines only digital transactions may overlook these aspects. Consequently, this study views organizational and employee performance as interrelated yet distinct outcomes, considering inclusiveness, service reliability and efficiency.

II. LITERATURE REVIEW

A. AI and Automation in Banking

According to the literature, digital banking is a synonym for infrastructure, redesigning processes, customer innovation, and decision support by data. Artificial intelligence is becoming increasingly relevant in the banking industry for credit screening, fraud monitoring, service assistance, and other applications. Jarrahi (2018) proposed that human–AI interaction is complementary in nature: machines provide analytical processing, while people offer contextual judgment under uncertainty. This approach is especially relevant for banking, where the technically feasible does not escape explanations and the regulator.

In their 2023 study, Saroy et al. examined the adoption of digital payments in India using data envelopment and dynamic panel methods. They found that adopting digital payments improved the cost efficiency of banks. However, they noted that this improvement did not result from a reduction in labour or other inputs. The RBI (2024) reviewed 29

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public and private sector banks for the period 2015–2023 and found that the coefficient of a measure of digitalisation is positively and significantly related to cost and technical efficiency of banks. However, since these studies broadly consider digitalisation and it is impossible to attribute their findings directly to AI systems.

According to the 2024 survey by RBI, offering features like mobile banking and digital KYC were widely used by people. However, newer features like chatbots were not widely used. In this way, not all banks or technologies innovate. Goyal et al. (2025), in their analysis of AI-based credit-risk and fraud-detection service adoption, highlighted the importance of technological know-how and user perception. This evidence supports paying attention to conditions of adoption rather than assuming that implementation will deliver results.

B. Workforce Productivity in Digital Banking

Research suggests that productivity gains may be explained by one or more of the following factors: shorter cycle times, less repetitive handling, access to organizational knowledge and increased consistency. In an experiment involving 453 professionals performing writing tasks, Noy and Zhang (2023) reported that generative AI reduced the average completion time by 40% and increased the measured output quality by 18%. A recent analysis of a new AI assistant revealed that customer support agents utilising the tool resolved, on average, 15% more issues per hour. Brynjolfsson et al. (2025) conducted a study on 5,172 customer support agents and found that. The tool benefits less experienced workers more than it benefits other workers. These studies support the possibility of AI augmentation, but their settings were not Indian banking organisations and the numerical effects must not be portrayed as productivity gains for Indian banks.

An organisation's capabilities influence workforce outcomes. Muduli and Choudhury (2026) found that among Indian banking employees, workforce agility positively mediates the relationship between acceptance of digital technology and technology outcomes. This finding connects people's agility to technology outcomes but does not prove that supportive management processes are key to the successful implementation of a program. In a cross-sectional survey of 349 employees in India's banking, finance and insurance sectors Mirkhil (2026) found a mild negative correlation between AI anxiety and self-reported employee performance. While this association does not imply causation and is not limited to banks, it highlights a potential issue in human resource management.

The research gap involves combining these various types of evidence into a single framework. Banks' cost efficiency and customer support experiments address different issues. Employee attitudes and corporate adoption disclosures focus on different issues. However, little verified evidence exists for Indian banks. They reveal little about how specific AI applications affect the long-term employee productivity and quality. This study presents a comprehensive thematic synthesis rather than a fresh numerical estimate.

C. Human Resource Management in the Age of AI

Human resources can help induce technological change by conducting manpower planning, recruiting, training, performance management, communication, and management of employee relationships. Automation might not be as effective in overseeing routine checks because it requires analytical reasoning, cyber-awareness, exception handling and clear explanations from customers. To adapt efficiently, it is essential to know what will change and which skills will become necessary because not every employee will require the same technical training.

Muduli and Choudhury (2026) define workforce agility as employees' ability to learn and change roles. It also means they can adapt effectively to new workflows. Human Resources departments can support structured practices. They can enhance internal mobility, create easily accessible learning opportunities, and recognize skills instead of tenure. The 'augmentation perspective' as advocated by Jarrahi (2018) suggests that rather than thinking of automation as a way to eliminate a job, we could

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redesign jobs for increased human judgment and machine assistance.

Challenges include unequal access to training programs. There are also fears of displacement, overreliance on generated answers, excessive monitoring, and ambiguity about responsibility for errors. Mirkhil (2026) found that greater psychological readiness leads to fewer challenges, making it crucial to consider this factor. HR policies should encourage open communication, provide fair opportunities for reskilling, and establish procedures for correcting inaccuracies. These steps impact employee well-being and productivity. Confused or scared users might turn away from tools that are biased or provide unhelpful answers.

Therefore, performance appraisal practices need to change. When an algorithm performs the bulk of mechanical steps, conventional indicators like the number of forms verified or number of cases closed may mislead. A re-designed appraisal can identify verification quality, decision-making in exceptional cases, stakeholder training and engagement with the technical teams. HR leaders should expect new specialist roles to emerge in model governance. They should also expect to take on roles in data quality, technology training, and process assurance. Such transitions need planned career paths. Otherwise, organizational gains might lead to unnecessary dissatisfaction and a loss of knowledge.

III. METHODOLOGY

A. Research Design

According to the research design, the research is secondary, analytical and qualitative descriptive. The study involved thematic synthesis and documentary review. Secondary research is appropriate since banking statistics, regulatory assessments, peer-reviewed studies, and corporate reports are all official, and this is in association with digital and specific workforce-related issue in the banking sector. This study does not use a research design that would allow us to collect original responses from employees. The research didn't conduct interviews, surveys, statistical models or independent measures of productivity.

The sources were chosen purposively for their direct relevance to Indian banking, AI or automation, operational efficiency, employee productivity and HRM implications. Official publications by the RBI and GOI, peer-reviewed studies, and disclosures made by Indian banks were prioritised in the selection. International experiments were added merely to illustrate task-level mechanisms that might apply to banking. From 2018 to 2026 we concluded discussions on certain basic conceptual work alongside contemporary developments. Banks' public disclosures were documented through their corporate annual and sustainability reports. These were not independent validations of their performance claims.

B. Data Collection and Analysis

The data were verified using journal or publisher records, or digital object identifiers for published studies. Official documents were obtained from the RBI, including publications on its website. The reports from the State Bank of India and Axis Bank for 2024–25 were shown as examples of institutional reports. The study found five types of information: technological application, population or organisation studied, reported results, workforce implications and limitations. The results were grouped according to adoption, productivity, employee capabilities, implementation strategies and governance.

The synthesis compared the sources, not their percentages. To demonstrate, the volume of payment made at a national level reflects the size of the sector, efficiency models of the RBI indicate bank outcomes, employee studies report on employees' perceptions and task performance. The two measures cannot be combined to form a strong overall productivity figure for AI because they are based on different foundations. The interpretations were further categorised into an observed association, experimental tests in other sectors, bank-reported initiatives or the present author's suggestion.

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However, this approach has several limitations. This narrative review is what is referred to as a focused review rather than a systematic review. Additionally, bank-reported outcomes were not subjected to formal meta-analysis or independent validation. Public sources may show a higher number of successful deployments than the actual reality. In addition, the definitions of who is adopting AI and what exactly AI productivity means vary. Consequently, while the analysis can pinpoint potential correlations and managerial implications, it is not possible to ascertain that any specific automation caused an increase in productivity in the Indian banking industry.

The aim of the review was to ensure interpretive consistency for each study or source of evidence, the review applied three questions: 1) What exactly was measured? 2) To which population do the results apply? 3) For what period do the results apply? What are the other possible explanations? An experiment in publication may provide stronger evidence for the effect of access to a particular tool than corporate disclosure but may be less relevant to Indian bank employees. In contrast, an Indian bank report may be contextually relevant but lacks comparator groups. The level of confidence associated with each finding was determined by these distinctions.

IV. FINDINGS AND DISCUSSION

A. Impact of AI and Automation on Workforce Productivity

First, institutional efficiency is associated with digitalisation but the impact of AI on jobs is uncertain. The RBI study of 29 banks states that digitalisation based on digital payments has a positive relationship with the cost and technical efficiency of banks. In 2023, Saroy et al. also observed that digital payments enhance cost efficiency. When combined these findings highlight the economic value of digital systems. Substitutes for human labour may allow these new capabilities to be realised more easily. The structure of the activities of the bank, various inputs and organizational changes also influence efficiency.

Second, task redesign is an immediate way for employees to benefit. The frequent repetition of tasks within the same context, such as classification, reconciliation, standard customer queries, and information retrieval, makes them ideal candidates for automation or artificial intelligence (AI) support. When employees spend less time searching for policy rules, they can focus on more challenging issues that require their attention. Although productivity increases, effectiveness is determined by how often we flag incorrect suggestions, as well as how much additional review is needed to ensure accuracy. Additionally, are the teams actually using the time saved for valuable work? When issues keep arising, reliance only on automated responses for speed results in confusion and client dissatisfaction**.**

Third, effects are likely to vary between roles and institutions. Customer service assistants can guide less experienced staff. In contrast, loan officers need to conduct more complex evaluations of credit and fairness. Fraud alert investigators face the challenge of false-positive alerts and the documentation of their resolutions. Big banks need more advanced technical infrastructure and specialized support. In contrast, smaller banks may encounter different capability limitations. The evidence does not clearly show whether public or private banks are better at using AI to boost employee productivity. We need to consider differences in business mix, staffing, customers, and deployment maturity.

Fourth, workforce attitudes and skills shape outcomes. Muduli and Choudhury (2026) connected workforce agility to digital technology results. Mirkhil (2026) discovered a negative relationship between AI anxiety and employee performance in the BFSI workforce. Implementation changes how an organisation operates and involves more than just installing software. AI and automation can enhance productivity but they rely on several factors. What matters is the effectiveness of employees' application of the results is crucial. The system must be reliable and roles must be redesigned.

B. Strategies for Enhancing Productivity

Task-based deployment is a useful strategy. Banks must identify major time-consuming

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processes for employees. These processes should have clear decision rules or reliable information sources and present manageable risks of error. It takes more than knowledge retrieval and/or managed document extraction to reliably make high-value lending decisions. Human review is also required. Baseline measures of processing time, rework, recurrence of complaints, accuracy and workload level of employees and customer satisfaction should be obtained by the various teams before rollout. An analysis of transaction and task complexity after deployment must take place.

Indian banks have demonstrated their implementation of such approaches. According to State Bank of India (2025a), digital technology taking over traditional banking has led to the requirement of skill-based talent management and digital upskilling to address the upskilling of staff and reassign them to revenue-generating roles. The sustainability report covered AI and analytics, as well as staff tools such as an internal assistant for addressing customer service and compliance questions (State Bank of India, 2025b). These disclosures reveal a combination of technological and workforce efforts. However, they do not assess how chatbots impact employee output.

Axis Bank (2025) launched Axis Deep Intelligence, a generative AI assistant that is now deployed in more than 5,500 branches and used by over 100,000 employees. According to the bank, there are over 4,500 bots running more than 1,850 automated tasks. The numbers indicate the scale of implementation, but it's not quantity of bots or users that indicate productivity. There is a need for an independent assessment to determine how often people really use the tools, how many errors are corrected, the real hours saved by the tools, and the impact on service quality and employee experience.

HRM strategies should focus on technology selection. Learning pathways must be customised for specific job roles in service, credit, risk, management and compliance. The staff should complete the following exercises:

- Verify the generated responses.
- Identify the unsupported recommendations.
- Protect personal data.
- Escalate uncertain cases to the appropriate authorities.

The impact of the training should be on the true performance at the workplace. A certificate of attendance alone is insufficient. When automation replaces routine tasks, employees should have realistic opportunities to transition to other roles. They should also have the opportunity to develop specialist skills and advance their careers.

A scorecard that measures productivity is more dependable than a single number. Relevant key indicators may include the number of correct cases resolved per employee per hour, first-contact resolution, turnaround time, error and rework rates, customer complaints, risk exceptions, and learning outcomes. HR teams can also monitor employees' confidence and their perceived workload. Using the new tool in phases with comparable teams, when possible, will help determine whether the improvement is due to the new tool or simply seasonal volumes and other unrelated process changes.

C. Challenges and Opportunities

Implementation poses technical, human, and governance challenges. Models dependent on machine learning may demonstrate bias or use incomplete datasets when making predictions. Similarly, generative AI can generate fluent sentences that are inaccurate or devoid of logic. It may weaken employees' independent foundering judgement power with overreliance on automated judgement. The infusion of solutions into legacy systems can trigger undesirable results such as duplicate processes, inconsistent information, and security loopholes. It is not effective to have a tool that speeds up one step but then requires manually checking several other steps because this will add work but not reduce it.

Workforce-related challenges are equally significant in this regard. When managers speak of cost savings without articulating plans for reskilling displaced workers, employees may view such automation as a threat to their jobs. Digital surveillance and unrealistic performance targets can

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lead to stress among employees. Training opportunities may not be equally available across regions or for all job functions. Consequently, implementing the banks requires transparent role mapping, equitable access to capability development and employee feedback mechanisms.

Opportunities extend beyond reducing expenses. AI-assisted knowledge retrieval can help frontline staff access specialised information more easily while automation can free up their time to focus on financial inclusion, relationship management, and complex problem-solving. If organisations decide to implement multilingual response systems, they must ensure the accuracy of the output. By employing risk analytics followed by human interpretation, threats can be identified and mitigated efficiently. These are promising potentials but not guaranteed results for all.

There is also an important distributional question to be considered. A department will increase its average processing rate even if some employees become more effective while others require help. Experienced officers may already be aware of what an assistant would pass on to other officers or they may add more value by reviewing exceptions or mentoring officers. Therefore, banks should examine outcomes across different skill levels and functions, not just the overall averages. A wide-ranging assessment would enable HR teams to better utilise training investments while preventing variations of starting points from being misinterpreted as resistance.

Policy establishes an important boundary for this study. According to the RBI Free AI committee report of 2025, seven guiding principles and 26 recommendations are proposed. The recommendations are classified into six strategic pillars, emphasising trust, people, and accountability with safe innovation being a key aspect. Employment and tech management depend on these ideas. The committee's recommendations should not be misrepresented as universally binding legal requirements. Banks must comply with RBI directions and data protection laws, follow current banking regulations and keep the panel's recommendations in mind for future governance plans.

This study adopts a task–skill–trust perspective. To boost productivity, it is important to choose the right tasks to ensure that employees can effectively use the technology and maintain strong organizational controls. A weakness in any single element may undermine the benefits of the others. This interpretation combines ideas and is not a framework tested in the present study.

V. Conclusion and Recommendations

A. Summary of Key Findings

The evidence reviewed indicates increasing efficiency and a growing range of AI applications due to the expansion of digital banking in India. Research that has undergone peer review, other than Indian banking, has proven that AI assistance can improve some tasks. In contrast, studies conducted in India have shown that workforce agility, technology knowledge and employee anxiety are relevant impacts. Both Axis Bank and SBI have divulged data on the deployment of AI, talent building and AI capacity. However, these are not independent or verifiable estimates.

Actually, the basic concept of human resource management is simple. However, productivity relies on human abilities, culture, the organisation, and technology. The task-skill-trust model helps to understand leaders' decision-making, connects change in the workforce with good governance and warns against relying on volumes of transactions.

B. Recommendations for Practice

Bank officials say that the first step in the selection process is to identify employee tasks. Subsequently, banks should choose AI applications. The selection must consider business, data quality and risk. A business must set the baseline for every action and access the resultant end result on speed, quality, customer result, rework and staff workload. Learning plans at the HR department need to include AI literacy and domain expertise. In addition, they should incorporate both into appraisal systems, career paths, and internal moves.

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Training should teach staff how to check AI outputs and set specific rules on when to involve human intervention.

Fourth, management must early communicate about changes and explain any new responsibility. The personnel must also have secure methods of reporting errors and raising concerns. They should assess models for the risk of unfair bias, privacy infringement, cyber threats and more. They ought to take notes of important decisions as well. Leaders must compare the benefits of this solution and the costs involved in the solution. They ought to not associate automation with productivity only. Technological modernisation can help improve standards of service and develop employee skills.

C. Future Research Directions

Future researchers should create long-term datasets on banks' AI adoption. Keeping records of training investments, personnel roles, productivity and quality service. A phased rollout using matched comparison groups will enable us to distinguish technological effects from other confounding factors. This includes general digitalisation, market demands and so on. By incorporating employee interviews in mixed-method studies, verified administrative results that capture task redesign and psychological responses can be obtained. It is useful to compare public and private banks, urban and rural branches as well as customer-facing and analytical functions. To attain precise knowledge, researchers need to control for key factors.

Researchers need to determine whether the gains are sustained beyond the initial learning period and how employee opportunities, autonomy and well-being improve or decline. This study clarifies how AI and automation impact worker productivity in India's banking sector.

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