

# The Role of Artificial Intelligence in Financial Services and Banking

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## Abstract

Artificial intelligence (AI) has moved from being a peripheral experiment to a working part of everyday banking, shaping how customers are served, how risk is priced, and how fraud is caught. This study examines the shift from two perspectives. First, it draws together the conceptual and empirical literature on AI in banking and financial services to map out the technologies in use, chief among them machine learning, natural language processing, robotic process automation, and predictive analytics, and the functions they now support, including fraud detection, credit scoring, customer service, and algorithmic trading. Second, it reports the results of a primary survey of 30 respondents, examining their awareness of AI-enabled banking, the extent to which they actually use such services, the reasons behind their preferences, and their concerns about privacy, security, and job displacement. The findings indicate that awareness of AI in banking is high (86.7 per cent of respondents), yet actual usage lags behind at 63.3 per cent, and a substantial share of users engage with these services only occasionally. Mobile banking recommendations and chatbot-based support emerged as the most recognizable AI touchpoints, while data privacy and cybersecurity risks were flagged as the most pressing concerns. The paper concludes that AI adoption in banking is best pursued as a complement to human judgement rather than a wholesale replacement for it, and offers a set of practical suggestions for financial institutions seeking to convert awareness into sustained, trusted usage.

**Keywords:** artificial intelligence, banking, financial services, fintech, customer perception, digital banking, machine learning

## I. Introduction

Banking has always been a data-heavy business, but the sheer volume, velocity, and variety of data that a modern bank generates through transactions, digital payments, loan applications, and online interactions has outgrown what manual processes and rule-based software can reasonably handle. Artificial intelligence has bridged this gap. In simple terms, ai is the ability of a computer system to perform tasks that would ordinarily call for human judgement, such as recognizing patterns, making predictions, understanding language, and adapting to new situations, and it does this by drawing on a cluster of underlying technologies: machine learning, deep learning, natural language processing, neural networks, predictive analytics, and robotic process automation. Together, these tools allow financial institutions to read very large datasets quickly, spot patterns that a human analyst would miss, and automate decisions that used to require a person at every step.

For most of their history, banks have relied on manual verification, paper trails, and a great deal of human intervention. Loan evaluation, account opening, and fraud checks were slow by design because they depended on people reviewing documents one at a time. This model is increasingly out of step with what customers now expect: near-instant transfers, round-the-clock support, and lending decisions that arrive in minutes rather than days. AI-driven systems have been the primary means by which banks have tried to close that gap, and in doing so, AI has moved from being a competitive differentiator to something closer to a baseline expectation across the banking and financial services industry (BFSI).



**Fig. 1. Role of artificial intelligence in financial services and banking**

## A. Industry background

The BFSI sector underpins the wider economy by mobilizing savings, extending credit, and enabling the transactions that other industries depend on. As it has been digitized, four broad families of AI technology have found the most traction inside it. Machine learning models are trained on historical transaction data to flag fraud and score the credit risk. Natural language processing powers chatbots and virtual assistants that now field a large share of routine customer queries. Robotic process automation takes over repetitive back-office tasks, such as document verification and compliance reporting. Predictive analytics is used for forecasting, from cash flow projections to market trend analysis. Each of these brings its own gains in speed and accuracy, but together they change the character of banking work itself, shifting staff away from repetitive processing and toward oversight, exception handling, and relationship management.

## B. Objectives of the study

The study was built around one primary objective and a set of secondary objectives that provided its structure.

**Primary objective:** This study examines the role of artificial intelligence (AI) in financial services and banking, with particular attention to how it is perceived and used by customers.

The secondary objectives are to (i) identify the principal AI technologies deployed in banking; (ii) examine how AI is applied across functions such as fraud detection, customer service, credit scoring, and risk management; (iii) assess the effect of AI adoption on operational efficiency and customer satisfaction; (iv) understand how AI shapes the personalization of banking services; (v) identify the

benefits and concerns that customers associate with AI-enabled banking; and (vi) gauge the future outlook that customers hold for AI in the sector.

### **C. Scope and significance**

The study is confined to the banking and financial services industry and draws on both secondary literature and a primary survey of individuals who use or are in a position to use digital banking services. Its value lies less in offering a definitive verdict on AI adoption and more in providing a grounded, customer-facing snapshot of where awareness currently stands, where usage lags behind that awareness, and which concerns are most likely to slow adoption if left unaddressed. This combination is useful for bank managers designing AI-based products, policymakers considering consumer protection in automated finance, and researchers looking for a starting point on customer-side AI acceptance in an Indian setting.

## **II. Literature review**

A useful literature review does two things: it shows what is already reasonably well-established and where the gaps are. A fair amount of research has been conducted on artificial intelligence in banking. The direct evidence of how ordinary customers, as opposed to institutions, perceive and use AI-enabled services is comparatively thin, which is the space this study tries to occupy.

### **A. Defining artificial intelligence**

The definitions of ai have shifted somewhat since the term was coined, but they converge on a common idea. John mccarthy, credited as the field's founder, described ai in 1956 as the science and engineering of building intelligent machines. Russell and norvig frame it more functionally, as the study of agents that perceive their environment and act to achieve their goals, while rich and knight put it more plainly as the effort to make computers do things people are currently better at. Read together, these definitions point to the same underlying idea: AI systems are built to sense, reason about, and act on information in ways that approximate human cognitive performance, and in banking, that translates into systems that can read a transaction, judge whether it looks suspicious, and act on that judgement without a person in the loop for every case.

### **B. Theoretical grounding**

Three theoretical strands are commonly used to understand how organizations and individuals adopt new technology, and each has something to offer here. The technology acceptance model (TAM) explains adoption in terms of perceived usefulness and perceived ease of use, both of which appear in this survey's data on why respondents say they prefer AI-enabled services. Innovation diffusion theory describes how a new technology spreads through a population over time, typically starting with a smaller group of early adopters. This pattern is broadly consistent with the gap this study finds between awareness (86.7 percent) and actual usage (63.3 percent). The resource-based view treats AI as a strategic asset capable of generating a sustainable advantage for the institutions that deploy it well, which is the lens most relevant to why banks are investing in AI in the first place, independent of how quickly customers take it up.

### **C. Review of prior studies**

Davenport and Ronanki (2018) looked at AI deployment across a range of industries, including banking, and found that automation, customer engagement tools, and predictive analytics produced measurable gains in efficiency and decision quality. Jarrahi (2018) examined how AI interacts with human decision-making and concluded that it tends to sharpen rather than replace judgement, largely by supplying data-

driven inputs to problems that are otherwise handled on intuition. Huang and rust (2018) studied ai in service settings more broadly and reported that it shortened service delivery times and improved customer interactions, particularly where personalisation was involved.

Closer to the banking sector, Chatterjee et al. (2019) found that AI adoption improved customer relationship management, fraud detection, and transaction-processing speed. Ryll et al. (2020) reported gains in investment decision-making, credit assessment, and risk management attributable to AI-based analytics. Dwivedi et al. (2021), reviewing AI adoption across industries more broadly, struck a more cautious note, observing that productivity gains came bundled with real concerns around privacy, ethics, transparency, and governance that firms could not simply set aside. Kumar and Ravi (2021) focused specifically on AI-based credit risk assessment and found that machine learning models generally outperformed traditional evaluation methods in predicting default risk.

More recent work has looked directly at customer perception, which is the focus of the present study. Sharma and Gupta (2022) surveyed Indian banking customers and found broadly positive attitudes toward AI-powered services, largely on convenience grounds. Alzaidiyeen and Al-Hazmi (2023) examined AI-based fraud detection and concluded that its main value lay in catching suspicious transactions early enough to limit losses. Singh and Verma (2024) studied the effect of AI adoption on customer satisfaction and operational performance in Indian banks and found consistent improvements in both, alongside continued momentum toward digital transformation.

#### **D. Research gap**

Two things stand out when these studies are read together. The first is a geographic imbalance: most of the empirical evidence on AI in banking still comes from developed markets, where digital infrastructure and regulatory frameworks are more mature, and it is not obvious that the same conclusions transfer cleanly to a developing-economy setting such as India. Second, and more directly relevant to this study, is a gap on the customer side. Much of the literature is written from the institution's perspective, on efficiency gained or costs saved, and comparatively little of it asks what customers themselves think, whether they trust these systems, and what would need to change for them to use AI-enabled services more consistently. This study aims to address this second gap by treating customer awareness, usage, and concern as the primary object of study rather than a secondary detail.

### **III. Research methodology**

This section sets out how the study was designed and carried out: the research design adopted, the sources and methods of data collection, the sampling approach, the hypotheses tested, and the tools used to analyze the responses.

#### **A. Research design**

The study follows a descriptive research design, which suits its purpose reasonably well. The aim is not to establish causal mechanisms but to describe, as accurately as the data allow, how aware customers are of ai in banking, how they use it, and what shapes their attitude toward it.

#### **B. Hypotheses**

Two working hypotheses guided this analysis.

H1: artificial intelligence has a significant positive influence on operational efficiency in the banking and financial services industry.

H2: artificial intelligence has a significant positive influence on customer satisfaction with banking services.

Both are examined qualitatively against the survey evidence in Section IV rather than tested through formal statistical inference, given the descriptive design and sample size adopted.

### C. Sources of data

Primary data were collected using a structured questionnaire administered to individuals with some exposure to digital banking. Secondary data were drawn from research journals, banking and regulatory reports, company disclosures, and academic literature on AI in financial services, and were used mainly to build the background and literature sections of the paper.

### D. Sampling design and sample size

Respondents were selected through convenience sampling based on accessibility and willingness to participate from among individuals who used banking services and had at least a working familiarity with digital banking. The questionnaire was circulated through an online form and yielded 30 usable responses (29 for the occupation question, where one response was left blank). While a larger sample would support more confident generalization, a sample of this size is adequate for the descriptive, exploratory purpose the study sets out to serve, and the demographic spread of respondents, discussed in Section IV, gives reasonable coverage across age, education, and occupation groups.

### E. Data collection method and analytical tools

The questionnaire combined demographic questions with items on awareness, usage, frequency of use, preferred features, perceived benefits, and concerns relating to AI in banking. Responses were analyzed using percentage analysis, tabulation, and simple descriptive statistics, with bar and pie charts used to present the distribution of responses visually.

### F. Limitations of the study

The findings should be interpreted with a few limitations in mind. The sample of 30 respondents, while workable for a descriptive study, is not large enough to support statistical generalization to the wider banking-customer population. The data reflect respondents' stated opinions and self-reported behavior rather than observed usage, which introduces the usual risks of recall and social desirability bias. The convenience sampling method, combined with time constraints on data collection, means that the sample skews toward younger, more educated, urban respondents, as the demographic profile in Section IV shows. Finally, because AI technology in banking is evolving quickly, some of the specific findings here may date faster than the broader patterns they illustrate.

## IV. Results and discussion

This section presents the survey findings in two sections. The first covers the demographic profile of the 30 respondents, and the second covers their awareness, usage, and perception of AI-enabled banking services. Each table is followed by the corresponding chart and a short interpretation of what the numbers suggest.

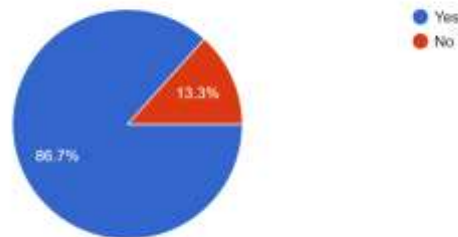
### A. Awareness, usage and perception of ai in banking

**Table Awareness of artificial intelligence in banking**

| Response | No. Of respondents | Percentage |
|----------|--------------------|------------|
| Yes      | 26                 | 86.7%      |
| No       | 4                  | 13.3%      |

|       |    |      |
|-------|----|------|
| Total | 30 | 100% |
|-------|----|------|

Are you aware of Artificial Intelligence (AI) in banking and financial services?  
30 responses



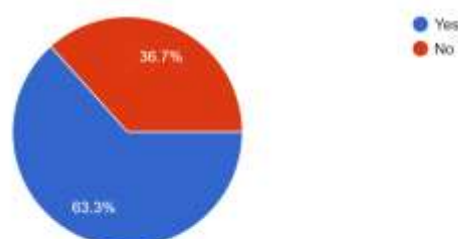
**Fig. 7. Awareness of artificial intelligence in banking**

An overwhelming majority, 86.7 per cent, said they were aware of AI in banking and financial services. Given the educated, urban profile of the sample, this is not entirely surprising, but it does confirm that AI in banking is no longer a niche or unfamiliar idea to the kind of customer represented here.

**Table Usage of ai-enabled banking services**

| Response | No. Of respondents | Percentage |
|----------|--------------------|------------|
| Yes      | 19                 | 63.3%      |
| No       | 11                 | 36.7%      |
| Total    | 30                 | 100%       |

Have you ever used AI-enabled banking services?  
30 responses

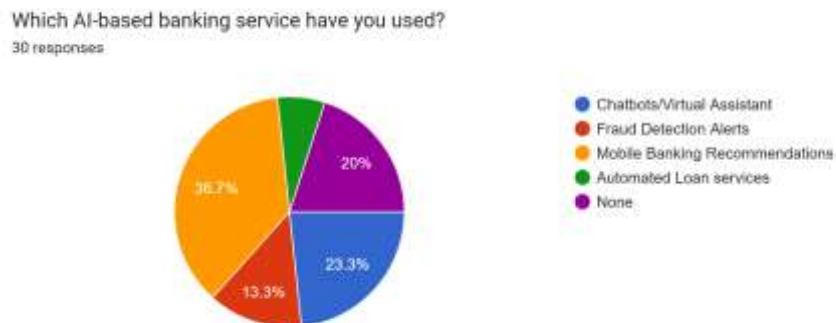


**Fig. 8. Usage of ai-enabled banking services**

Actual usage, at 63.3 per cent, trails awareness by over 20 percentage points. This gap is arguably the single most important number in this study: it suggests that knowing ai exists in banking is not the same as being willing, or perhaps able, to use it, and that the barrier to adoption lies somewhere between recognition and action rather than at the level of basic awareness.

**Table Ai-based banking service used**

| Service                        | No. Of respondents | Percentage |
|--------------------------------|--------------------|------------|
| Chatbots / virtual assistant   | 7                  | 23.3%      |
| Fraud detection alerts         | 4                  | 13.3%      |
| Mobile banking recommendations | 11                 | 36.7%      |
| Automated loan services        | 2                  | 6.7%       |
| None                           | 6                  | 20%        |
| Total                          | 30                 | 100%       |



**Fig. 9. Ai-based banking service used by respondents**

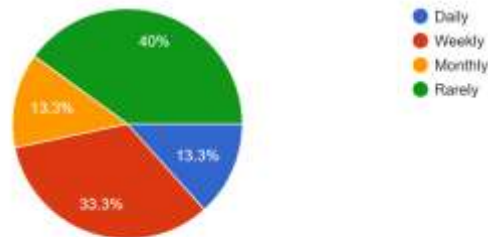
Mobile banking recommendations were the most commonly used AI feature (36.7 per cent), followed by chatbots and virtual assistants (23.3 per cent). These two account for six in ten respondents' ai usage, which suggests that the services customers notice and adopt first are the ones that show up directly inside the app they already use, rather than the back-end systems, such as fraud detection, that operate largely out of sight.

**Table Frequency of using ai-supported digital banking**

| Frequency | No. Of respondents | Percentage |
|-----------|--------------------|------------|
| Daily     | 4                  | 13.3%      |

|         |    |       |
|---------|----|-------|
| Weekly  | 10 | 33.3% |
| Monthly | 4  | 13.3% |
| Rarely  | 12 | 40%   |
| Total   | 30 | 100%  |

How often do you use digital banking services supported by AI?  
30 responses

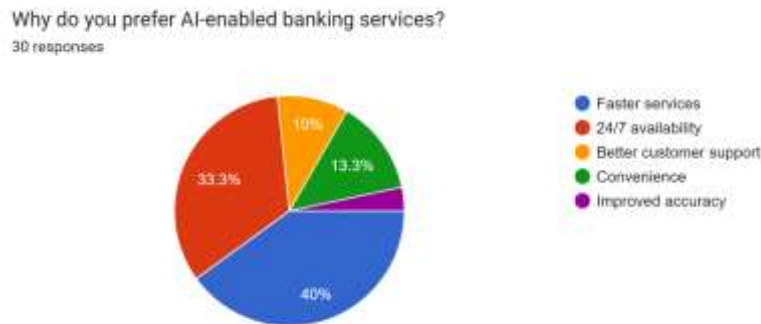


**Fig. 10. Frequency of using ai-supported digital banking**

Frequent users, those on a daily or weekly basis, make up 46.6 per cent of respondents combined, but a comparable 40 per cent say they use such services only rarely. Habitual use of ai-enabled banking, in other words, is still forming rather than fully established, even among a sample that is otherwise well-disposed toward the technology.

**Table Reasons for preferring ai-enabled banking services**

| Reason                  | No. Of respondents | Percentage |
|-------------------------|--------------------|------------|
| Faster services         | 12                 | 40%        |
| 24/7 availability       | 10                 | 33.3%      |
| Convenience             | 4                  | 13.3%      |
| Better customer support | 3                  | 10%        |
| Improved accuracy       | 1                  | 3.3%       |
| Total                   | 30                 | 100%       |



**Fig. 11. Reasons for preferring ai-enabled banking services**

Speed and round-the-clock availability together account for 73.3 per cent of the reasons respondents give for preferring AI-enabled services, well ahead of accuracy or the quality of support. This points to a fairly practical, convenience-driven basis for adoption: customers seem to value AI mainly for saving them time, rather than for any perceived superiority in judgement over a human alternative.

### C. Discussion in relation to the hypotheses

H1 proposes that AI has a significant positive influence on operational efficiency. The survey evidence lends this cautious support: half of respondents believe AI reduces human error, and speed and round-the-clock availability are the two reasons cited most often for preferring AI-enabled services, both of which point toward efficiency gains as perceived from the customer's side. The evidence is not experimental, so it cannot establish causation, but the pattern is consistent with the hypothesis rather than against it.

H2 proposes that AI has a significant positive influence on customer satisfaction. However, the evidence is more mixed. Chatbots enjoy strong acceptance, and the preference for AI-enabled services is high on convenience grounds, which supports the hypothesis. Simultaneously, the large neutral segments on the security and error-reduction questions and the persistence of privacy and cybersecurity concerns as the top worries suggest that satisfaction is conditional rather than unqualified. Customers seem willing to like AI banking in principle while still reserving judgement on the details that would make them trust it fully.

## V. Findings and suggestions

### A. Major findings

1. Respondents spanning different age groups, occupations, and residential backgrounds took part in the survey, giving the findings a reasonably varied, if youth- and student-skewed, base.
2. Awareness of AI in banking is high (86.7 per cent), but actual usage is meaningfully lower (63.3 per cent), pointing to an awareness-to-action gap rather than an awareness problem.
3. Mobile banking recommendations and AI chatbots are the two AI features that respondents recognized and used the most, together accounting for over 60 per cent of reported usage.
4. Habitual, frequent use of ai-enabled banking is still developing: 40 per cent of respondents use such services only rarely.
5. Speed and continuous availability, rather than accuracy or support quality, are the main reasons respondents give for preferring ai-enabled services.

6. Respondents are cautiously positive about ai's role in improving security, fraud detection and reducing human error, but in both cases roughly half remain neutral rather than firmly convinced.
7. Ai chatbots enjoy the broadest acceptance of any single ai application tested, with 86.6 per cent of respondents finding them at least sometimes helpful.
8. Data privacy and cybersecurity risk are the two leading concerns about ai in banking, well ahead of job loss, which ranks last among the concerns tested.
9. Overall attitudes toward ai in banking are positive but measured: respondents see clear benefits but have not yet fully resolved their concerns about security and privacy.

## B. Suggestions

1. Banks should invest in customer-facing awareness campaigns that go beyond informing customers that ai exists and instead demonstrate specific, everyday use cases, since the gap this study finds is between awareness and usage, not in awareness itself.
2. Cybersecurity and data-privacy safeguards should be strengthened and, just as importantly, communicated clearly to customers, given that these two concerns dominate customer hesitation more than any operational shortcoming does.
3. Ai-powered chatbots, already the best-received feature in this survey, should be prioritised for continued investment and refinement, since improving something customers already trust is likely to yield faster returns than introducing entirely new ai features.
4. Banks should keep a visible human escalation path alongside ai-driven services, so that customers who value the human touch, a concern raised by close to a quarter of respondents, are not left without recourse.
5. Given that convenience and speed, not accuracy, are what customers currently value most in ai banking, marketing and product messaging should lead with those benefits rather than technical claims about ai sophistication.
6. Regulators and industry bodies should continue developing clear, accessible guidelines on data use and algorithmic accountability in ai-driven banking, both to protect customers and to give banks a stable framework to build trust around.
7. Financial institutions should treat ai as a complement to, not a substitute for, human staff, training employees to work alongside ai systems rather than positioning ai purely as a cost-cutting replacement for them.

## VI. Conclusion

Artificial intelligence has become a working, everyday part of banking rather than an experimental add-on, and the findings of this study confirm that customers are broadly aware of that shift. What the study also shows, though, is that awareness on its own does not guarantee usage. A sizeable share of respondents who know ai-enabled banking exists have not yet made it a habitual part of how they bank, and the reasons for that gap trace back mainly to unresolved concerns about data privacy and cybersecurity rather than to any doubt about whether ai actually works.

Where ai has clearly won customers over, in chatbots and in mobile banking recommendations, it has done so by being visible, convenient and directly useful in daily interactions. Where it has not, in fraud detection and error reduction, the issue does not appear to be performance but visibility and trust: customers cannot easily see these systems working, so their support for them remains more neutral than

enthusiastic. This suggests that the next phase of ai adoption in banking will depend less on further technical improvement and more on transparency, communication and consistent security assurance. The study is naturally limited by its sample size and its skew toward younger, urban, well-educated respondents, and the pace of change in ai technology means some specific figures reported here will date faster than the broader pattern they describe. Even so, the central finding, that awareness has outpaced trust-based usage, is likely to hold in outline even as the specific technologies and numbers shift. Future research would do well to track this gap over time, to compare it across demographic and regional groups, and to look more closely at what would need to change, technically and communicatively, for customers to move from cautious acceptance to confident, routine use of ai in their banking lives.

### **Acknowledgment**

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