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Artificial Intelligence in Banking Services: A Study with Special Reference to Badarpur, Barak Valley, Assam

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ABSTRACT

Artificial Intelligence (AI) has brought revolution in the banking industry by detecting fraud, resolve customer inquiries, monitor customer behavior and recommend personalized services. This paper explores the awareness and application of artificial intelligence in banking services in Badarpur, Barak Valley, Assam. This research also highlights the benefits and challenges associated with the integration of AI in the financial sector by a comprehensive analysis of the body of existing literature. The results exhibit how AI technologies have made impact on decision-making, reduced operating costs and increased overall profitability. However, in order to guarantee the ethical and sustainable application of AI in the future, it is crucial to address issues with data privacy, prejudice and ethical reasons. Data have been collected through primary data and secondary data. Primary data have been collected through questionnaire and secondary data have also been collected such as reports, journals, RBI data etc. The study is confined to Badarpur town which comes under Barak Valley, Assam, India. There are eight banks in the Badarpur town. Out of eight banks, four Government Banks such as SBI, PNB, CBI and AGVB and four Private Banks such as Axis, ICICI, HDFC and Bandhan Bank have been taken into consideration.

***Keywords**: Artificial Intelligence, Banking, Fraud Detection, Credit Scoring.*

Introduction

Artificial Intelligence (AI) is the computer-controlled technology to perform tasks that typically require human intelligence and understanding. Artificial intelligence can be used in a variety of ways to improve the banking sector such as detect fraud, resolve customer inquiries, monitor customer behavior and recommend personalized services. Artificial intelligence helps in automate processes, make better decisions and manage customer requests with less effort (Radhikaand Shriraksha, 2024).The application of AI in banking has lots of benefits, but it also has difficulties and moral dilemmas. The most important of them is data security and privacy, since AI applications use significant volumes of sensitive consumer data. Financial organizations must use robust security measures to safeguard customer privacy and prevent data breaches. The establishment of frameworks and regulations is needed to control the moral use of AI and promote justice, accountability, and transparency. (Russell and Norvig, 2003).

Rationale of the Study

The study seeks to understand how Artificial Intelligence (AI) is transforming banking services and what challenges and opportunities exist, particularly in the Badarpur town of Barak Valley, Assam.

Review of Literature

Adrian Lee (Jan 23, 2017) Banking on artificial intelligence - The purpose of this article was to determine the most prominent forms of AI within the banking industry. AI-driven customer service, real-time fraud prevention and risk management-it's the last one that might appeal most to those interested in industry disruption

In his work, Sadok (2022) noted how the usage of artificial intelligence (AI) has affected the methods used by banks and other financial institutions to determine credit scores. These restrictions serve as the foundation for a new age of economic law that includes bank-used data and AI algorithm certification.

Sadok, H.(2022) explores the effects of artificial intelligence (AI) use on banks and other financial organizations' credit score assessment processes. These limitations lay the foundation for a new era of economic law that includes bank-used data and AI algorithm certification.

Research Gap

Artificial Intelligence (AI) is transforming the global banking industry by enhancing operational efficiency, customer service and risk management. Numerous studies have been conducted in India and abroad on the applications and impact of AI in banking. However, most of these studies are having a significant gap regarding awareness and application of AI in banking in the context of Assam especially Badarpur in Barak Valley.

Objectives of the Study

- To assess awareness and adoption of Artificial Intelligence in selected banks in Badarpur town, Barak Valley, Assam.
- To study benefits and challenges in the adoption of Artificial Intelligence in Banking.

Research Methodology

The paper is descriptive, in the sense that the study attempts review literature to understand the various concepts, and analytical by the way that it attempts to analyze the Artificial Intelligence in the Indian Banking sector. Data have been collected through primary data and secondary data. Primary data have been collected through questionnaire and secondary data have also been collected such as reports, journals, RBI data etc. The study is confined to Badarpur town which comes under Barak Valley, Assam, India. There are eight banks in the Badarpur town. Out of eight banks, ***four Government Banks*** such as SBI, PNB, CBI and AGVB and ***four Private Banks*** such as Axis, ICICI, HDFC and Bandhan Bank have been taken into consideration. Data have been collected from 200 respondents, 25 respondents from each bank. Respondents comprise *Customers and Banking Staff.*

Limitations of the Study

While this research aims to contribute valuable insights, it is essential to acknowledge its limitations. First, the study relies on a self-developed questionnaire, introducing the possibility of respondent bias. Despite efforts to design comprehensive questions, the subjectivity inherent in individual responses may impact the study's generalizability. Secondly, the study's focus on the Indian banking sector might limit the broader applicability of findings to other global contexts.

Analysis and Interpretation of the Study

Through demographic section of the questionnaire, essential background information about the respondents have been found. This helps to understand the profile and diversity of participants, which in turn aids in analyzing how different groups perceive and adopt Artificial Intelligence (AI) in banking. Age is a key demographic factor in adoption studies. Different age groups may have varying levels of technological adaptability and attitudes toward AI.

Respondents (from 25 to 35) are typically more comfortable using AI-driven banking services like chatbots, mobile banking and digital payment platforms. Respondents (above 55) show less awareness toward AI adoption, often due to lesser familiarity with advanced technology.

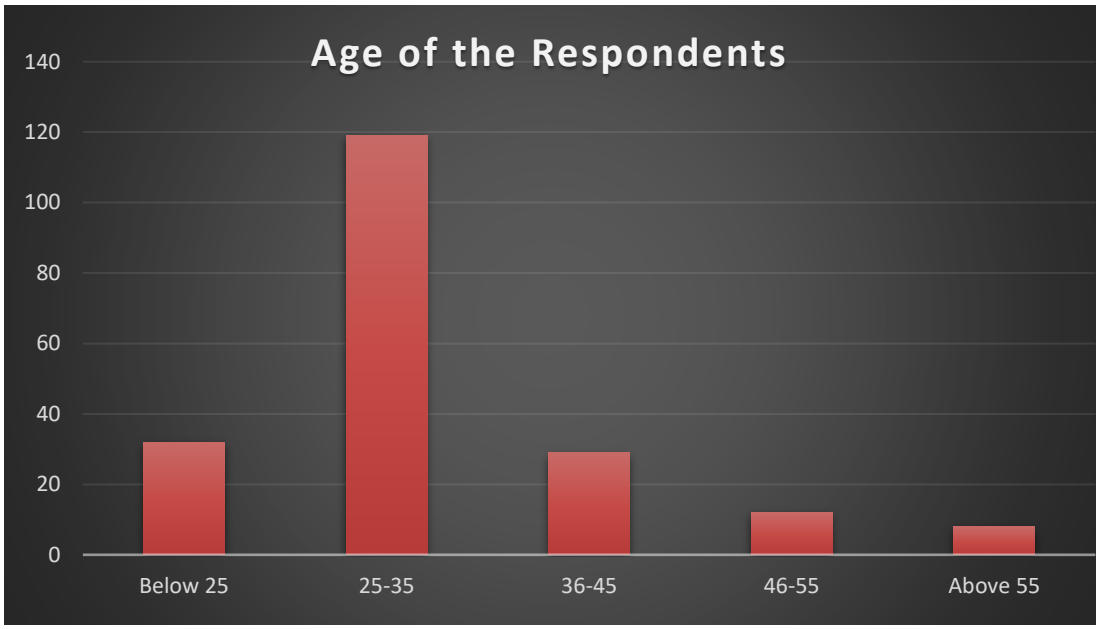


Figure 1: Demographic Profile of the Study

Findings of the Study

- A fundamental question is designed to know a person's general understanding of AI.

Interpretation of responses:

- Very familiar (59%): It indicates the respondents are well acquainted of what AI is, including its core principles, its various applications and its potential impact.
- Regarding “Somewhat familiar” (21%): Respondents have a basic understanding of AI. They know what it is in a general sense.
- Heard of it, but not sure (12%): The respondents have heard the term "AI" in news, media or conversation, but they lack a clear definition or understanding of what it entails.
- Not familiar at all (8%): The respondent has no prior knowledge of or exposure to the term "Artificial Intelligence."
- Out of selected 8 banks, Bandhan Bank and Assam Gramin Vikash Bank are less aware about AI as compared to other selected banks.

Regarding assessment of the respondent's awareness of AI's application:

This question directly assesses the respondent's awareness of AI's application within a specific industry. It's a simple "yes/no/not sure" question that serves as a filter for the next question.

Interpretation of Responses

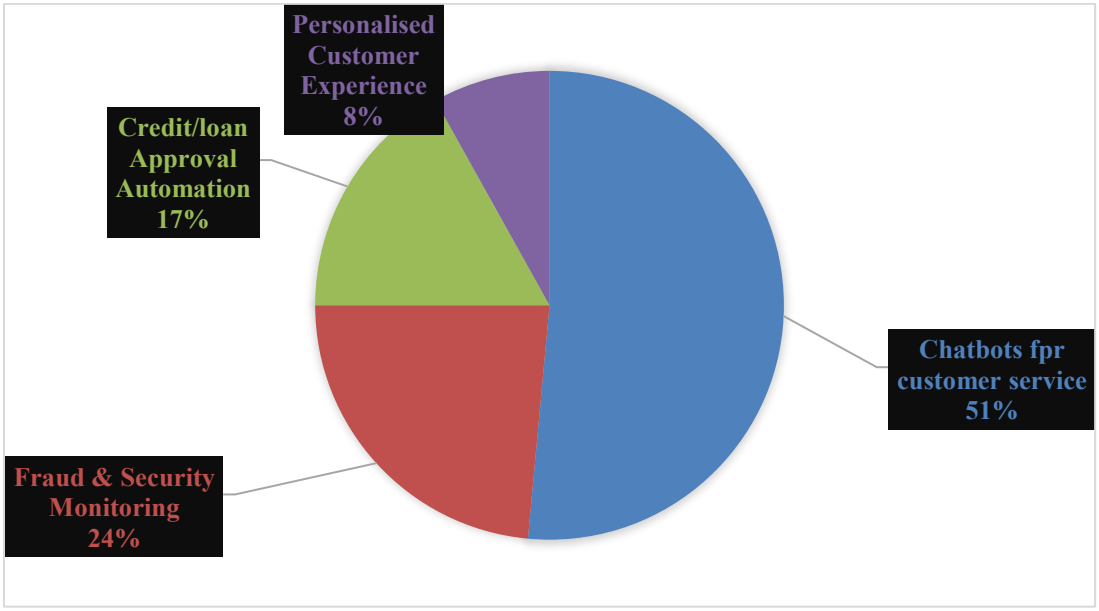
- Yes: 80% of the respondents replies that AI is currently in use in the banking industry. This indicates they have some awareness of the modernization and technological advancements happening in finance.
- No: 17% of the respondents do not believe AI is being used in banking. This happens due to a lack of knowledge that banking is still a very traditional, human-centric industry.
- Not sure: Rest of the respondents are uncertain.
- 63% of the respondents are aware about chatbots/virtual assistants AI applications followed by 21% are aware about automated loan processing and 10% are aware about fraud detection systems.
- The survey is designed to not only measure awareness but also to identify the specific areas where the public is most or least informed about AI's role in modern banking.

Adoption of AI in Banking

This question identifies whether respondents' banks are actively implementing AI technologies. It separates banks into **AI adopters** and **non-adopters**, helping to understand the level of technological penetration in the banking sector.

- **Interpretation of Responses**
  - Yes: It has been observed that 68% of the respondents indicates that AI adoption has taken place, reflecting the bank's interest in modernization, efficiency, and customer satisfaction.
  - No: 24% respondents that bank is lagging behind in adopting digital innovations, possibly due to cost, lack of awareness, or infrastructural challenges.
  - Not sure: 8% of the respondents show uncertainty among customers, which may point to low awareness or poor communication from the bank about its AI initiatives.
  - To identify specific AI applications in banking and understand which services are most commonly used or recognized by customers. By analyzing responses, it has been ranked that AI services such as **Chatbots for Customer Service like** Virtual assistants (SBI YONO, HDFC's EVA, ICICI's iPal) that handle queries, balance checksand FAQsare most visible or impactful to customers.

Figure 2: AI Services Bank Currently Use



To measure the level of customer engagement with AI services. Adoption is not only about banks implementing AI but also about customers actually using them. It has been found that 24% of the Customers frequently use chatbots, fraud alerts, mobile banking, or personalized recommendations. On the other hand, 58% of the customers rely on AI services only when necessary, showing partial adoption. It can be said that high frequency indicates strong acceptance, while low usage shows challenges in awareness, accessibility, or trust. This interpretation helps to measure the penetration of AI adoption at the user level but it also reflects user behavior, trust, and dependency on AI services.

Benefits of AI in Banking

- Findings are categorized by respondent type (bank employees vs. customers) to see differences in perception.
- Customers prioritized better experience and security, while banks prioritized highlight cost reduction and efficiency.
- It has been observed that 87% of the respondents strongly agreed AI offers benefit to both customers and banks followed by 8% respondents are neutral about the benefits of AI. However, theoretically the benefits of AI in banking can be summed up as follows:

Enhanced Efficiency

The incorporation of AI technologies automates manual processes, mitigating human error and reducing processing times. By automating repetitive tasks, AI systems boost operational efficiency, streamlining various banking operations. This results in expedited and more precise transaction processing, account management, and data analysis.

- **Improved Decision-Making:** AI algorithms demonstrate prowess in handling vast amounts of data and extracting valuable insights. In the realm of banking and finance, AI-based systems contribute to more accurate risk assessments, robust fraud prevention measures, and sophisticated investment strategies. These insights empower financial institutions to make informed, data-driven decisions, thereby enhancing overall decision-making processes (Roseline at al., 2022).
- **Cost Reduction:** The integration of AI in banking and finance yields significant cost reductions. Through the automation of manual tasks, financial institutions can optimize resource allocation and curtail operational expenses. Additionally, AI-based systems contribute to improved risk management, lowering the likelihood of financial losses.
- **Enhanced Customer Experience:** AI-powered customer service tools, such as chatbots, deliver personalized and prompt support to customers. With 24/7 availability, chatbots efficiently address customer queries, resolve issues, and offer recommendations in realtime. This not only elevates the overall customer experience but also fosters customer loyalty (Singh and Pathak, 2020).
- **Efficient Compliance Management:** Artificial Intelligence (AI) has the capability to automate the monitoring of compliance and risk, thereby minimizing the time and expenses typically incurred in manual compliance procedures. This automation ensures adherence to regulations, lowers the risk of regulatory fines and penalties, and bolsters the overall compliance initiatives of banks and financial institutions".

Challenges of AI in Banking

The key obstacles banks face when implementing AI. Since respondents can choose multiple options, the data has been analyzed using frequency and percentage distribution. After analysis, the following findings relating to challenges of AI in banking are summed up below:

- The most common challenge is high implementation cost (70%), showing that budget constraints are the main barrier to AI adoption.
- Data privacy and security concerns (60%) and lack of skilled workforce (55%) are also major issues which indicates that technical capability and trust are critical.
- Resistance from employees (35%) and regulatory/legal issues (40%) suggest organizational and compliance hurdles.
- Only 25% reported customer trust issues which exhibits that customers are becoming more open to AI-based banking services.

In short, it can be said that AI adoption in banking is primarily hindered by cost, data security and skill shortages. Banks need to invest in training and data protection measures to overcome these barriers.

The main challenges banks face in adopting AI include high implementation costs, lack of skilled workforce, data privacy and security concerns, resistance from employees, regulatory/legal issues and customer trust issues. Each of these obstacles is critical and multidimensional, impacting the pace and effectiveness of AI deployment in banking environments. However, theoretically the key challenges of AI in banking can be summed up as follows:

- **High Implementation Cost:** Modernizing legacy banking systems to support AI demands substantial financial investment. Integration with existing infrastructure is complex and expensive, often requiring the overhaul of core technologies and data management practices.
- **Lack of Skilled Workforce:** There is a shortage of people with technical skills to build, maintain, and understand AI systems in finance. Developing and retaining talent for AI-driven transformation remains a top concern for banks.

- **Data Privacy and Security Concerns:** Banks handle massive amounts of sensitive personal and financial data. The introduction of AI raises the stakes for data privacy, including risks of data breaches, unauthorized access, and compliance failures. Regulations like GDPR, CPRA, and others further complicate the environment, requiring banks to institute robust data protection and compliance protocols.
- **Resistance from Employees:** Heightened reliance on AI can lead to dissatisfaction and resistance among staff who fear job displacement, loss of decision-making authority, and over-automation of essential banking functions.
- **Regulatory/Legal Issues:** Fast-evolving global regulatory frameworks for AI pose uncertainty for banks. Issues around algorithmic transparency, legal responsibility for AI-driven errors, and data usage permissions require continual adaptation and rigorous governance.
- **Customer Trust Issues:** Customers often remain skeptical about the capacity of AI systems to handle their sensitive financial information ethically and securely. Trust is influenced by transparency, fairness, explainability, and the perceived integrity of AI-based decisions.
- **Other Notable Challenges:** Algorithmic bias, poor data quality, legacy infrastructure, and inability to scale AI solutions also hamper adoption (https://www.reuters.com).

Conclusion

AI is gradually proliferating the banking industry to reinforce financial services. In the time of social distancing and quarantine, people are more likely to take the digital route to stay up to-date with their bank accounts and make transactions. With such advantages, it is nearly obvious that the majority of banks and financial institutions will adopt AI to stay competitive and deliver better customer support. Artificial Intelligence provide much more strength and helps banks to boost organizational success and in achieving their main goals viz., Performance, Profitability, Compliance, Competitiveness and Risk Reduction. They are the game changers and can help banks distinguish themselves and remain competitive in the future data driven world.

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