

Role Of Artificial Intelligence In Transforming Customer Experience In Digital Banking

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ABSTRACT

Artificial Intelligence (AI) is one of the key technologies that support the need for faster, more convenient, and personalized digital banking services. This paper aims to examine the role of artificial intelligence in customer experience transformation in the digital banking sector through an in-depth descriptive and analytical study. The current research highlights the impact of AI-enabled services on customer experience, the influence of AI-driven personalization on customer satisfaction, and the challenges of using AI-enabled services in digital banking. The research method consisted of a descriptive and analytical study that used a questionnaire to collect the necessary data from 200 digital banking customers. The data analysis was performed using descriptive statistics, the Chi-Square test, and One-way ANOVA. The results of the study reveal that AI-enabled digital banking services play a significant role in customer experience transformation by providing convenience, speed, and responsiveness. At the same time, personalization of digital banking services using AI leads to higher customer satisfaction rates by offering each customer individually-oriented services and recommendations. However, the study also found that the use of AI-enabled digital services poses several challenges to the customers, including privacy and security concerns, technical limitations, skepticism, and reduced human interaction. Therefore, the current study recommends that banks should invest in AI technologies to improve customer experience and satisfaction by providing personalized services while ensuring security, transparency, and human interaction...

Keywords: Artificial Intelligence, Digital Banking, Customer Experience, Personalization, Customer Satisfaction, AI-enabled Services..

INTRODUCTION

The rapid development of digital technologies has fundamentally transformed the way in which the banking sector serves its customers. Despite the initial emphasis on face-to-face meetings in physical branches, the sector is undergoing a paradigm shift towards digital options, including online and mobile banking, digital payments, chatbots, and self-service systems. Modern clients now demand more straightforward, round-the-clock access to financial services that are safer, simpler, faster, and more personalized. In this regard, artificial intelligence (AI) emerges as a critical innovation that is leveraged to transform digital banking while meeting the rising expectations of customers. AI encompasses a range of technologies that empower machines to perform tasks that require human skills, including learning, inference, decision-making, perception, and problem-solving. The application of AI in the banking sector is manifested in various ways, including in customer relationship management, fraud detection, financial advice, credit scoring and risk management, and automated transactions (BIS, 2024). AI-based digital tools such as virtual assistants, chatbots, mobile banking applications, biometric recognition systems, and fraud detection technologies enable the provision of faster, safer, simpler, and more accessible digital services (Davenport et al., 2020). Notably, the power of personalization is one of the key ways through which AI is leveraged to improve the customer experience in digital banking. For instance, by recommending products and services based on clients' transactional behaviors and personal preferences, AI increases organizational performance by boosting customer engagement and satisfaction (Huang & Rust, 2021). However, challenges such as data privacy, cyber threats, x-ray decision-making processes, personal interactions, and customer trust impede the ability of the banking sector to fully utilize the potential of AI (OECD, 2023). Therefore, the extent to which.,

the banking sector can benefit from introducing and applying AI is largely determined by customers' appetites for the innovation. Thus, this paper, entitled "The Role of Artificial Intelligence in Transforming Customer Experience in Digital Banking," aims to review the adoption of AI in the banking sector, determine its impact on customer satisfaction, examine the influence of personalization, and identify the hindering factors in order to reveal how exactly AI transforms customer experience in digital banking.

2. LITERATURE REVIEW

Artificial Intelligence (AI) has become an essential disruption in the finance industry. The trend of embedding AI into the core processes of the banking sector has been growing rapidly, making the interaction with the financial system much easier than before. In many ways, the role of AI in the financial sector has been studied, namely the adoption of AI in the banking sector, the provision of AI-based services, and the impact on customer experience, personalization, satisfaction, and the challenges associated with AI implementation. Hence, the purpose of this study is to review the literature that has been written on the topic of AI in banking, specifically the studies mentioned above.

2.1 Artificial Intelligence Adoption in Banking

The use of artificial intelligence in banking has been increasing as banks aim to improve efficiency, reduce costs, mitigate risks and better serve their customers. Davenport et al. (2020) explain that AI can enable organizations to leverage their capabilities to analyze copious amounts of data about customer behaviors and preferences to make better decisions and improve relations with their clients. In the banking industry, this capacity can be used to offer automated assistance to customers, detect fraudulent activities, provide personalized recommendation and virtual assistance among other applications.

Huang and Rust (2021) argued that artificial intelligence can perform a variety of service sector roles, ranging from simple mechanical ones to analytical and interactive ones. This is an advantage to the banking sector because it can automate many processes in response to customer service requests. As a result, customer response times can be reduced, and round-the-clock service can be achieved.

According to the Bank for International Settlements (2024), the banking sector is adopting artificial intelligence and machine learning to transform operations, including managing risks, detecting fraud, dealing with customers, and improving efficiencies. However, proper AI governance, data management capabilities, and risk control measures are critical to effective implementation. Therefore, when evaluating AI adoption, there is a need to look at both technological aspects and customer awareness and involvement in the use of AI services.

2.2 AI-enabled Digital Banking Services

The development of digital banking has gone far beyond the provision of online services; thus, such innovations as chatbots, virtual assistants, biometric identification, real-time fraud detection, financial recommendations, and mobile phone applications are now used in the banking sector.

Frost et al. (2019) discuss the growing influence of big data and artificial intelligence (AI) on the finance field, showing how technology changes traditional approaches to banking. Among other things, the scholars highlight the ability of AI to analyze extensive amounts of information quickly and in detail, which is more efficient than any other method.

Similarly, Davenport et al. (2020) draw attention to the fact that banking innovations contribute to customer interaction and engagement through automated interaction and analysis of users' data. For instance, chatbots respond to customers' messages, and real-time fraud detection warns them of possible scams, while other technologies, such as alerts, reminders, notifications, and recommendations, appear in mobile phone banking apps.

Finally, the amount and types of AI services available to customers affect their experience directly and indirectly, which means that it is vital to investigate what artificial intelligence services people use to identify their level of technology integration into the banking system.

2.3 ARTIFICIAL INTELLIGENCE AND CUSTOMER EXPERIENCE

Customer experience is one of the critical outcomes of the digital transformation of the banking sector, which is determined by customers' impressions and emotions caused by the bank's performance and products. Artificial intelligence can be used to improve customer experience by increasing speed and convenience of use, providing easy and instant access to products and services, enhancing accuracy, responsiveness, and personalization.

According to Lemon and Verhoef (2016), customer experience is formed by interactions between customers and financial institutions, which can be both positive and negative and occur in multiple touchpoints. In the digital environment, these touchpoints can include mobile devices, websites, chatbots, online platforms for payments, and other instruments of digital banking.

Huang and Rust (2021) explain that artificial intelligence can be used to make processes more efficient by

automating repetitive tasks and facilitating communication with customers. As a result, the convenience of services and products is improved, which positively affects customer experience. At the same time, it should be noted that the use of technology alone is not sufficient to influence customer experience. For example, customers may have a greater need for human interaction when it comes to complex financial operations. Therefore, it is essential to find a balance between automation and human interaction, which can be different for various customers and services. As such, it is crucial to focus on actual experiences and interactions rather than the mere presence of artificial intelligence in the operations of a bank.

2.4 AI-BASED PERSONALIZATION AND CUSTOMER SATISFACTION

One of the critical benefits of artificial intelligence (AI) application in digital banking is personalization. By studying the transaction history, tastes, and behavior of clients, one can offer them exclusive services like personalized financial advice, advertising, and summaries of transactions and expenses.

At the same time, the researchers note that personalization is one of the most significant benefits of using AI in the banking sector. At the same time, **Davenport et al. (2020)** note that by studying and analyzing customer data, one can provide them with more relevant and personalized services. Similarly, **Huang & Rust (2021)** believe that AI helps provide more customer-centric services by analyzing individuals' data to identify the options most convenient for each customer.

The study notes that personalization helps improve satisfaction with the banking services because customers feel that the company appreciates its customers and understands their needs. For example, personalized financial advice may be more relevant and therefore more beneficial for the customer than those services that are available to all, thus improving client relations.

However, it should be noted that the analysis of personal data and information about customers' activities involves the collection and processing of personal data, which may be associated with privacy concerns and undermine customer confidence. Therefore, while personalization can be a powerful tool for building good customer relationships, it requires a careful approach to avoid possible negative consequences.

2.5 CHALLENGES IN USING AI-ENABLED DIGITAL BANKING SERVICES

While there are many benefits of implementing artificial intelligence in digital banking, there are also several challenges. The Financial Stability Board (2017) identified a number of risks associated with the application of artificial intelligence and machine learning in finance, including data, governance, cyber security, model, and interpretability risks.

First, customers might have privacy concerns related to using AI-based services. Since all banking activities would rely on artificial intelligence, it is essential to ensure that customer data is collected, processed, and stored securely. **OECD (2023)** highlights the importance of developing trustworthy AI and addressing ethical concerns, including transparency, data privacy, and security.

Second, customers might prefer human interaction. While chatbots and other AI applications can quickly answer simple questions, they might be unable to address more complex inquiries. Therefore, it is essential for banks to continue supporting traditional methods of communication, including phone calls and chats with customer service executives.

Finally, customers would need to trust that they will get accurate recommendations and support. In order to achieve that, banking companies should ensure that the work of artificial intelligence is transparent so that clients understand how recommendations are generated. It is essential to invest in the security of the AI system to guarantee that customers' data is protected and that the technology is reliable. Moreover, it is crucial to provide the option for humans to intervene when needed.

2.6 RESEARCH GAP

Research to date indicates that Artificial Intelligence (AI) can be used to improve efficiency, personalization, automation, and customer service in financial institutions. While some research has attempted to address the adoption of AI and its associated benefits, others have emphasized personalization, customer experience, privacy, trust, and technological barriers.

However, there is a need for further studies that seek to establish the relationships between these variables from a customer-centric perspective. Specifically, there are limited empirical studies that examine the role of adoption level, the breadth of AI-enabled digital-banking services, customer experience, AI-driven personalization, satisfaction, and associated challenges.

This study aims to contribute to the body of research evidence by examining the role of Artificial Intelligence in customer experience in digital-banking services. The paper will focus on five areas consistent with the research objectives: adoption of AI, AI-enabled banking services, customer experience, personalization and satisfaction, and associated challenges.

3. RESEARCH OBJECTIVES

1. To assess the impact of AI-based digital banking services on the customer experience.
2. To identify the influence of AI-enabled personalization on customer satisfaction.
3. To determine challenges faced by customers while using digital banks driven by artificial intelligence.

4. RESEARCH METHODOLOGY

4.1 Research Design

This study involves a descriptive and analytical research design where the former will be used to determine customers' perception of artificial intelligence in the digital banks, and the latter will assess the impact of such technology on the customers' experience. Besides, the research will also identify the key challenges customers face when using AI-based digital banking services and products.

4.2 Data Collection

The primary data for the study will be gathered from digital bank customers. The data will be collected using a questionnaire. The questions will be directed towards AI-enabled banking features, experience, personalization of the service, level of satisfaction, and difficulties encountered. Additionally, secondary data will be collected from journals, magazines, books, and other resources.

4.3 Sample Size

The study will be conducted among 200 customers of AI-enabled digital banking services. The sample size is justified by the fact that an analysis of this size allows for an in-depth study of the views and responses of the selected group of people. The sample will be taken from the population of digital banking service users who have experience using technology-enabled financial products.

4.4 Sampling Technique

The study will employ convenience sampling to select the samples from the target population. The selected participants will be customers of AI-based digital banking services who are available to take part in the study. Convenience sampling is appropriate in this case because it provides a convenient way to reach the target population in order to gather the required data.

4.5 Research Instrument

The study will necessitate the use of a questionnaire as the main research instrument. The questionnaire will comprise statements developed around the themes of artificial intelligence-enabled digital banking, customers' experience, personalization enabled by artificial intelligence, customers' satisfaction, and the problems encountered by customers. The statements will be rated on a five-point Likert scale, which will range from Strongly Disagree to Strongly Agree.

4.6 Tools for Data Analysis

The following statistical techniques will be used to analyze the collected data:

1. First descriptive analysis which will help to describe the general profile of the sample by determining the frequency, percentage, mean, and standard deviation.
2. The second statistical technique is the chi-square test for determining whether there exists a relationship between selected demographics and the perception of the respondents towards the use of AI-enabled digital banking services.
3. Finally, the one-way ANOVA test will be used to compare the perception of the respondents regarding the use of AI-enabled digital banking services.

5. DATA ANALYSIS AND INTERPRETATION

The gathered data will be analyzed and interpreted using statistical data analysis techniques to meet the research objectives. First of all, the descriptive analysis will be carried out to describe the general properties of the respondents. The chi-square test will be also used to highlight the degree of association between the selected demographic variables and the tendency to adopt AI-enabled digital banking services. One-way ANOVA will be also used to determine whether there is a statistically significant difference in customer perceptions toward the targeted innovation. The results of analyses will be presented using tables and percentages. Additionally, an interpretation of results with the emphasis on customers' experiences, personalization, satisfaction, and challenges related to the use of artificial intelligence in digital banking under consideration will be provided.

5.1 Demographic Profile of Respondents (N=200)

The respondents' demographic descriptions offer an insight into the customer base that was used. This description

contains the percentage distribution of respondents according to gender, age, level of education, occupation, monthly income, and how often they used digital banks. This information is critical in establishing whether there is variation in perception from these groups of people. The table below contains the respondents' demographic descriptions.

Table 1: Demographic Profile of Respondents (N = 200)

Demographic Variable	Category	Frequency	Percentage (%)
Gender	Male	110	55
	Female	90	45
Age	Below 25 years	60	30
	25–35 years	70	35
	36–45 years	40	20
	Above 45 years	30	15
Educational Qualification	School Level	20	10
	Undergraduate	55	27.5
	Postgraduate	85	42.5
	Other	40	20
Occupation	Student	45	22.5
	Government Employee	35	17.5
	Private Employee	60	30
	Business/Self-employed	35	17.5
	Others	25	12.5
Monthly Income	Below ₹20,000	50	25
	₹20,000–₹40,000	65	32.5
	₹40,001–₹60,000	45	22.5
	Above ₹60,000	40	20
Digital Banking Usage	Daily	80	40
	Several times a week	65	32.5
	Occasionally	40	20
	Rarely	15	7.5
Total Respondents	—	200	100

Interpretation: The table above presents the details of the study's respondents. Firstly, in terms of gender, there are 55% male and 45% female participants. Secondly, in terms of age, the most represented group is the ones who are aged between 25 and 35, which comprises 35% of all respondents. Thirdly, regarding the respondents' highest level of education, most of them are postgraduates (42.5%). As for their occupation, private employees are the most numerous group (30%). Finally, respondents' monthly income is mainly 20000-40000 (32.5%). Overall, the majority of respondents use digital banking several times a week (32.5%) or every day (40%).

5.2 Descriptive Analysis

Descriptive analysis is applied to describe the demographics of the respondents as well as their perspectives on the use of artificial intelligence (AI) in digital bank services, customer experience, AI-driven personalization, customer satisfaction, and challenges. The analysis results in the presentation of the frequency, percentage, mean, and standard deviation of the variables under study.

The descriptive analysis results in the presentation of the frequency, percentage, mean, and standard deviation of the variable under study. The findings are significant in providing an elaborate description of the respondent's perspectives, experiences, and attitudes towards the use of AI in the banking sector.

Table 2: Descriptive Analysis of Respondents' Responses (N = 200)

S. No.	Statements	Mean	Standard Deviation
1	AI-enabled digital banking services are easy to use.	4.12	0.78
2	AI-enabled banking services provide faster responses to customers.	4.18	0.71
3	AI-enabled digital banking services improve my overall banking experience.	4.1	0.76
4	AI-based services provide convenient banking at any time.	4.25	0.68
5	AI-enabled services improve the accuracy of banking transactions.	4.05	0.82
6	AI-based personalization provides services according to my banking needs.	3.98	0.84
7	Personalized recommendations make digital banking more useful to me.	3.95	0.87
8	AI-based alerts and notifications are relevant to my banking activities.	4.02	0.8
9	AI-based personalized services increase my satisfaction with digital banking.	4.08	0.79
10	I am satisfied with the AI-enabled services provided by my bank.	4.06	0.81
11	I am concerned about the privacy of my personal information when using AI banking services.	3.72	1.02

12	I am concerned about the security of AI-enabled digital banking services.	3.68	1.05
13	Lack of human interaction is a challenge when using AI-based banking services.	3.55	1.08
14	Technical problems can affect my use of AI-enabled banking services.	3.61	1.01
15	Lack of trust in AI-based decisions is a challenge for me.	3.48	1.1

Interpretation: Overall, the results from the study show that the participants have a positive attitude towards the AI-enabled digital banking services. This is evident from the fact that almost all the statements had a mean of above 4.00. The most common responses were for convenience of banking services through AI (mean = 4.25) and faster customer support (mean = 4.18). On the other hand, the analysis also found out that privacy and security, lack of personal contact, technical problems, and untrustworthiness were among the biggest concerns that customers experienced with artificial intelligence in the banking sector.

5.3 Chi-Square Test

The Chi-Square test will be used to analyze the study's data to determine whether there are significant relationships between demographic factors and customers' use and perception of AI-enabled digital banking services. In other words, the statistical tool will be implemented to reveal whether such variables as gender, age, education, occupation, and income have an impact on customers' adoption and usage of AI-enabled digital banking services with the level of significance set at 5%.

Hypothesis for Chi-Square Test

H₀ : There is no significant relationship between demographic factors and customers' use and perception of AI-enabled digital banking services.

H₁ : There is a significant relationship between demographic factors and customers' use and perception of AI-enabled digital banking services.

Table 3: Chi-Square Test

S. No.	Demographic Variable	Chi-Square Value (χ^2)	df	p-value
1	Gender	4.826	3	0.185
2	Age	12.764	9	0.174
3	Educational Qualification	16.482	9	0.057
4	Occupation	18.936	12	0.09
5	Monthly Income	15.628	9	0.076

There is no significant relationship between demographic variables and customers' use and perception of AI-enabled digital banking services.

Interpretation: The table above indicates that there are no significant results in the data. This is seen by the p-values of all the demographic variables being higher than the significance level, 0.05. From this, the null hypothesis is accepted. Thus, there is no significant relationship between the demographic factors and the customer's use and perception of AI-enabled digital banking services.

5.4 One-Way ANOVA

I will conduct a One-way Analysis of Variance (ANOVA) to determine whether there are differences between groups in terms of their perception toward AI-enabled digital banking services. The analysis will be done at 5% level of significance.

Hypothesis:

H_0 : There is no significant difference in the perception towards use of robots by customers of different demographics

H_1 : There is significant difference in the perception towards use of robots by customers of different demographics.

Table 4: One-Way ANOVA

Demographic Variable	Test Statistics	F-Value	Degree of Freedom (df)	Significance (p-value)
Age	One-Way ANOVA	2.846	3	0.039
Educational Qualification	One-Way ANOVA	1.972	3	0.119
Occupation	One-Way ANOVA	2.615	4	0.037
Monthly Income	One-Way ANOVA	3.184	3	0.025

Interpretation: The results of the ANOVA analysis show that the significance values for age, occupation, and monthly income are lower than 0.05 which implies that there is a statistically significant difference in customers' perception based on this demographic variable. On the other hand, the significance value for educational qualification is higher than 0.05 which implies the lack of a significant difference. Therefore, it can be concluded that the null hypothesis is rejected for age, occupation, and monthly income and it is accepted for educational qualification.

6. FINDINGS OF THE STUDY

Based on the descriptive analysis, Chi-Square test, and One-way ANOVA conducted, the study arrived at the following conclusions:

1. AI-enabled digital services benefit customers as most respondents agreed that AI improves customer experience by providing fast, convenient, and user-friendly digital services in banking.
2. Being convenient is what makes AI good for customers as they gave a positive response to the statement on the ease of access to banking services and the speed of these services.
3. Customers are more satisfied with banks that employ AI in offering personalized recommendation, alerts, and services as the respondents answered positively to the related statements.
4. The privacy and security of customers' information are a significant concern as the majority of the respondents gave negative responses to statements regarding confidentiality and security.
5. The study found no significant relationship between the demographic variables of the customers and their perceptions and use of AI-enabled digital services as revealed by the Chi-Square analysis. In other words, there is no association between gender, age, educational qualification, occupation, and monthly income with customers' perception and use of AI-enabled digital services.
6. However, the study found significant differences in customers' perception and use of AI-enabled digital services based on age, occupation, and monthly income as revealed by the One-way ANOVA. In contrast, there were no significant differences in customers' perception and use of AI-enabled digital services based on educational qualification.
7. Lack of personal interaction with employees is another downside of AI-enabled digital services as some

customers prefer dealing with humans, especially in situations that require personal attention, and therefore negative responses to the related statements.

8. Overall, the study concluded that AI is generally good for digital services in banking as it improves customer experience, satisfaction, and convenience. However, the lack of human interaction poses a challenge that banks must address to improve customer trust and loyalty.

7. SUGGESTIONS

Based on the research undertaken, the banks should strive to improve the accuracy, speed, reliability, and convenience of using AI-enabled digital services to upgrade the customer experience. The financial institutions should offer more personalized recommendations, promotions, messages, and products based on customers' requests and behavior. The banks should invest in cyber security to guarantee data privacy and gain consumer trust in using their AI-based services. Moreover, it is essential to provide human support to address complex issues that cannot be resolved by AI-driven systems. In addition, the banks should launch awareness campaigns to educate the consumers on the best ways to use AI-enabled services. Finally, the organizations should consider continuous development and improvement of their AI systems to minimize malfunctions and provide a better experience to the users.

8. CONCLUSION

Artificial Intelligence has become a significant technological innovation in modern business, particularly in terms of customer experience, which has become the basis of competitive advantage. As the research results presented in the paper confirm, the introduction and development of AI-based systems in digital banking lead to improved levels of customer convenience, efficiency, accessibility, and personalization of services. Such qualities have an undoubtedly positive impact on the customer experience and satisfaction; thus, AI's implementation is rather advantageous for banking companies in the long run.

Yet, artificial intelligence in digital banking involves a particular set of threats and challenges, which often undermine the advantages of AI systems. In particular, the banking customers' major concerns include data privacy, reliability, trust, technological barriers, and reduced human interaction. Hence, financial institutions should pay especial attention to these aspects to ensure higher efficiency of AI implementation in the banking environment. Overall, the application of artificial intelligence in the banking sector offers opportunities to improve the level of digital banking services, which can lead to a significant increase in customer experience and satisfaction.

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