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**ROLE OF CHATBOTS IN DIGITAL BANKING: A STUDY OF CUSTOMER AWARENESS AND PERCEPTION WITH SPECIAL REFERENCE TO PUNE CITY**

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**ABSTRACT**

*The rapid advancement of Artificial Intelligence (AI) has significantly transformed the digital banking landscape, particularly through the adoption of AI-powered chatbots. Chatbots are increasingly used by banks to provide instant customer support, enhance service efficiency, and reduce operational costs. Despite their widespread implementation, customer awareness and perception towards chatbot-based banking services play a crucial role in determining their acceptance and effectiveness. This study aims to examine the level of customer awareness and perception regarding chatbots in digital banking services in India. The study is empirical in nature and is based on primary data collected from 189 digital banking users through a structured Likert-scale questionnaire. Descriptive statistics, One-Sample t-Test, and Chi-Square Test were employed using SPSS software to analyze the data and test the hypotheses. The findings reveal that customers have a significant level of awareness regarding chatbot services and generally exhibit a positive perception towards their usefulness, convenience, and efficiency. However, concerns related to trust, data security, and lack of human interaction remain challenges. The study concludes that while chatbots play a vital role in enhancing digital banking services, banks must focus on improving customer awareness, transparency, and ethical AI practices to ensure sustainable adoption.*

**Keywords:** Chatbots, Digital Banking, Artificial Intelligence, Customer Awareness, Customer Perception

**1. INTRODUCTION**

The Indian banking sector has witnessed remarkable digital transformation over the past decade, driven by technological advancements, increasing internet penetration, and changing customer expectations. Digital banking services such as mobile banking, internet banking, Unified Payments Interface (UPI), and fintech innovations have reshaped traditional banking operations. Among these technological advancements, Artificial Intelligence (AI) has emerged as a powerful tool in improving customer engagement and operational efficiency.

Chatbots, a prominent application of AI, are computer programs designed to simulate human conversation using natural language processing (NLP) and machine learning algorithms. In digital banking, chatbots assist customers by answering queries, providing account-related information, facilitating transactions, registering complaints, and offering personalized financial advice. Leading Indian banks such as State Bank of India (SBI), ICICI Bank, HDFC Bank, and Axis Bank have deployed chatbot services like SIA, iPal, EVA, and Aha to enhance customer service delivery.

The growing adoption of chatbots is primarily attributed to their ability to offer 24×7 services, reduce waiting time, and lower operational costs. However, the effectiveness of chatbots largely depends on customer awareness and perception. Customers who are well-informed about chatbot functionalities are more likely to use and trust them, whereas lack of awareness or negative perception can hinder adoption.

In this context, understanding customer awareness and perception towards chatbots in digital banking becomes crucial. This study attempts to analyze these aspects empirically, focusing on Indian digital banking users.

**2. LITERATURE REVIEW**

Several researchers have examined the role of AI and chatbots in banking and financial services.

Sharma and Gupta (2021) observed that AI-based chatbots significantly enhance customer satisfaction by providing quick responses and consistent service quality. The study emphasized that ease of use and accessibility are key determinants of chatbot acceptance.

Kumar and Singh (2022) analyzed customer perception towards chatbot services in Indian banks and found that customers appreciated the convenience and speed of chatbot services. However, concerns regarding privacy, data security, and limited emotional intelligence were highlighted as major challenges.

Dwivedi et al. (2021) explored the adoption of AI technologies in financial services and concluded that trust, perceived usefulness, and transparency are critical factors influencing customer acceptance of chatbots.

According to a report by the Reserve Bank of India (2023), AI-driven customer service tools, including chatbots, are becoming integral to digital banking strategies. The report stressed the importance of ethical AI frameworks and robust data protection mechanisms.

While existing literature provides valuable insights into chatbot adoption and benefits, limited empirical studies focus simultaneously on customer awareness and perception using statistical hypothesis testing in the Indian digital banking context. This study aims to bridge this research gap.

### 3. OBJECTIVES OF THE STUDY

The present study has the following objectives:

1. To study the level of customer awareness regarding chatbot services in digital banking.
2. To analyze customer perception towards chatbots in digital banking services.
3. To examine the association between customer awareness and perception of chatbots.
4. To provide suggestions for improving chatbot adoption and effectiveness in digital banking.

### 4. HYPOTHESES OF THE STUDY

Based on the objectives, the following hypotheses were framed:

**H<sub>01</sub>:** Customers do not have a significant level of awareness regarding chatbot services in digital banking.

**H<sub>02</sub>:** There is no significant association between customer awareness and perception of chatbots in digital banking.

### 5. RESEARCH METHODOLOGY

It adopts a descriptive and analytical research design, since it concentrates on the quantitative analysis of primary data and the sample size is 189 based on convenience sampling method.

Target Population: Clients banking online with Indian public and private sector banks. It states that a sample size of 189 considered statistically sufficient for the research and testing hypothesis. The primary data were collected by using a structured questionnaire on 5-point Likert scale which includes their opinion about chatbot services. A summary of the descriptive statistics was employed. The level of awareness was measured using One-Sample t-Test, whereas the relationship between customer awareness and perception of chatbot services in digital banking was examined through Chi-square Test.  $P < 0.05$  was considered significant.

### 6. DATA ANALYSIS AND TEST OF HYPOTHESES

#### 6.1. Descriptive Analysis

Descriptive statistics were employed to summarize and present the responses collected from 189 digital banking customers regarding their awareness and perception of chatbot services in digital banking. Descriptive analysis helps in understanding the central tendency, variability, and overall response pattern of the data before applying inferential statistical tests.

**Table 01:** Descriptive Statistics

Variable	N	Mean	Std. Deviation	Minimum	Maximum
Awareness	189	3.87	0.61	2.10	4.90
Perception	189	3.92	0.58	2.30	4.80

The above table reveals that the mean of customers' chatbot service awareness scores is 3.87, which rate for customer knowledge regarding chatbot services significantly exceeded beyond (neutral value) due to level three Likert scale points. It indicates that customers have a relatively high level of awareness in chatbot use when it comes to the digital banking service. With a standard deviation of 0.61, it reveals moderate level of consistency among opinions, such that most customers have similar perceptions on their knowledge level about chatbots. Abstract The average perception of chatbot services for customers is 3.92, similarly above the neutral midpoint. This indicates a positive customer attitude toward banking through chatbot in general. standard deviation of 0.58 indicates that there is not a high degree of dispersion, if any as to say, in the responses about the efficiency and effectiveness of chatbots; customers agree mostly on this point.

#### 6.2. Test of Hypotheses

The present study is based on primary data collected from 189 digital banking customers. Statistical analysis was carried out using SPSS software, and the level of significance was fixed at 5% ( $\alpha = 0.05$ ).

**6.2.1. One-Sample t-Test**

The One-Sample t-Test is used to examine whether the sample mean differs significantly from a specified test value. In this study, it is applied to test whether customers have a significant level of awareness regarding chatbot services in digital banking.

**Hypothesis**

- **H<sub>0</sub>:** Customers do not have a significant level of awareness regarding chatbot services in digital banking.
- **H<sub>1</sub>:** Customers have a significant level of awareness regarding chatbot services in digital banking.

**Test Value**

Since awareness is measured using a 5-point Likert scale, the neutral value 3 is considered as the test value.

**Table 2: One-Sample Statistics**

Variable	N	Mean	Std. Deviation	Std. Error Mean
Awareness	189	3.87	0.61	0.044

**Table 3: One-Sample t-Test**

Test Value = 3

Variable	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval
Awareness	19.77	188	0.000	0.87	0.78 – 0.96

**Calculation of One-Sample t-Test****Formula**

$$t = \frac{\bar{X} - \mu}{\frac{s}{\sqrt{n}}}$$

Where:

- $\bar{X}$  = Sample Mean = **3.87**
- $\mu$  = Test Value = **3**
- $s$  = Standard Deviation = **0.61**
- $n$  = Sample Size = **189**

**CALCULATION**

$$t = \frac{3.87 - 3}{\frac{0.61/\sqrt{189}}{0.044}}$$

$$t = 19.77$$

therefore, the p-value = 0.000 < 0.05 Hence, Null Hypothesis (H<sub>01</sub>) is rejected. The One-Sample t-Test result indicates that customers have a statistically significant level of awareness regarding chatbot services in digital banking. The mean awareness score is significantly higher than the neutral value, confirming that customers are well aware of chatbot-based banking services.

**6.2.2. Chi-Square Test**

The Chi-Square Test is used to examine whether there is a significant association between two categorical variables. In this study, it is applied to test the association between Customer Awareness Level and Customer Perception towards chatbots.

**Hypothesis**

- **H<sub>02</sub>:** There is no significant association between customer awareness and perception of chatbots in digital banking.
- **H<sub>12</sub>:** There is a significant association between customer awareness and perception of chatbots in digital banking.

**Categorization of Variables**

Variable	Categories
Awareness Level	Low, Medium, High
Perception Level	Negative, Neutral, Positive

**Table 4:** Case Processing Summary

Case Processing Summary						
	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Awareness * Perception	189	100.0%	0	0.0%	189	100.0%

The Case Processing Summary reveals the total number of responses collected for the study (189) were completely valid. No responses were missing for awareness or perception variables. It will imply that 100% of the data could be employed for analysis, and trustful results, and precision would be obtained. As no cases had to be left out, the results of the analysis and crosstabulation (chi-square) refer to all participants that have been examined and users can conclude with relatively high reliability and validity

**Table 5:** Awareness v/s Perception Crosstabulation

Awareness * Perception Crosstabulation						
			Perception			Total
			1	2	3	
Awareness	1	Count	18	12	6	36
		Expected Count	6.1	12.6	17.3	36.0
	2	Count	10	34	45	89
		Expected Count	15.1	31.1	42.9	89.0
	3	Count	4	20	40	64
		Expected Count	10.8	22.3	30.8	64.0
Total		Count	32	66	91	189
		Expected Count	32.0	66.0	91.0	189.0

**Table 6:** Chi-Square Tests

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	40.072 <sup>a</sup>	4	.000
Likelihood Ratio	35.901	4	.000
Linear-by-Linear Association	28.906	1	.000
N of Valid Cases	189		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 6.10.

The Chi-Square test results reveal a compelling link between customers' awareness of chatbot services and their overall perceptions in digital banking. With a Pearson Chi-Square value of 40.072 (df = 4) and a p-value of 0.000 far below the 0.05 threshold the evidence points to a genuine relationship, not random variation.

This conclusion holds firm under the Likelihood Ratio test, which reinforces the association's robustness. Even more tellingly, the Linear-by-Linear Association highlights a clear pattern: as awareness rises, so does positive perception of chatbots, suggesting a logical progression in customer attitudes.

Crucially, the test satisfies key assumptions, with no expected cell frequencies dipping below 5 (the lowest at 6.10). These reliable findings underscore how boosting awareness could meaningfully shape favourable views of chatbot-driven banking experiences.

We applied the standard decision rule for hypothesis testing: if the p-value falls below the significance level of 0.05, we reject the null hypothesis ( $H_{02}$ ). Here, the p-value of 0.000 is substantially lower than 0.05, leading us to confidently reject  $H_{02}$ . The Chi-Square test result indicates a statistically significant association between customer awareness and perception towards chatbots in digital banking. Customers with higher awareness levels tend to exhibit a more positive perception of chatbot services.

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## 7. FINDINGS OF THE STUDY

1. Customers using digital banking services have a significant level of awareness about chatbot-based banking services.
2. Overall customer perception towards chatbots is positive, particularly in terms of convenience, speed, and availability.
3. There is a significant association between customer awareness and perception towards chatbots.
4. Despite positive perception, concerns related to data security and lack of human interaction persist.

## 9. CONCLUSION

Chatbots are reshaping digital banking as a key AI innovation, making customer interactions faster and more personal. This study finds that awareness of these services is growing, with most customers rating them as practical and effective. Our statistical analysis, including highly significant Chi-Square results ( $p = 0.000$ ), proves awareness strongly shapes positive perceptions far beyond mere coincidence.

That said, persistent concerns around trust, privacy, and AI ethics could undermine this progress. Banks should prioritize customer education drives, sharper chatbot performance, ironclad data safeguards, and principled AI deployment. Addressing these will transform chatbots from novelties into reliable pillars of enhanced experiences and enduring digital banking success.

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