THE ROLE OF CHATBOTS IN DIGITAL BANKING AND IT'S AWARENESS AMONGST CUSTOMERS OF INDIAN COMMERCIAL BANKS

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Abstract

AI has taken over the world, and India is not lagging behind in embracing it. In the new AI-driven world, revolutionary changes are being witnessed across sectors in India. One such sector that has adopted and deployed AI in its business operations with unprecedented scale and speed is the Indian banking sector. This move toward digital transformation, with the help of AI, is satisfying customers' ever-changing demands through modern digital banking tools like mobile applications, digital wallets, WhatsApp banking, AI-powered chatbots, and virtual assistants. The integration of chatbots in digital banking has upscaled the way banks interact with customers, offering enhanced services, cost efficiency, and an improved user experience. This research aims to explore the role of chatbots in digital banking, focusing on two major areas: customer awareness and their contribution to enhancing digital banking revenue. By employing a survey method, we assess the level of awareness among banking customers regarding chatbot services and how these technologies influence their banking behaviour. Additionally, the study aims to explore whether the adoption of chatbot services by banks is linked to the revenue generated from their digital banking operations. The findings are expected to offer valuable recommendations to banks based on customers' awareness and perceptions of the chatbot services they offer, as well as whether these services optimize their revenue generation from digital banking practices.

Keywords: *Chatbot Services, Digital banking, Customer awareness, Indian Commercial Banks.*

INTRODUCTION

Artificial Intelligence is the current big thing and is definitely going to shape our future. Despite the existence of dual narratives on AI regarding how it is reshaping our existence, the adoption of AI has become mandatory in order to survive in today's highly competitive global economy. Not only that, but if AI is utilized correctly, the possibilities are limitless.

Today, AI is incorporated into every sector across economies, and the same can be observed in India. India's perception of AI was clearly articulated by our Prime Minister when he said, 'Loss of jobs is AI's most feared disruption. But history has shown that work does not disappear due to technology. Its nature changes, and new types of jobs are created.' India believes in the strength of AI and is prepared to face the challenges that come with it. This gradual acceptance of Artificial Intelligence is evident in almost all sectors of the Indian economy like Space, Agriculture, Hospitality, Defence and Manufacturing. However, the sector that has implemented and also benefited a lot is the Finance sector—specifically, banking and insurance.

The entire concept of the banking business is evolving with new-age technology and changing consumer perceptions. Gone are the days when people had to stand in long queues just to clear a cheque for their hard-earned salary or visit a branch to apply for a loan.

The digitalization of Indian banks has marked another phase of banking evolution, empowering people and contributing to the goal of an inclusive economy. The rapid evolution of technology has significantly transformed the landscape of the banking sector, particularly in India, where digital banking has become a cornerstone of financial services. From the first Automated Teller Machine (ATM) installed by HSBC in Mumbai in 1987 to the latest virtual assistants used by banks, the Indian banking sector has come a long way. Initially, digital banking gained popularity through mobile banking and internet banking, followed by WhatsApp banking—each having its own pros and cons. One such emerging concept in modern banking is Chatbot AI-driven conversational agents that has emerged as critical tool for enhancing customer engagement and streamlining banking operations. As Indian commercial banks increasingly use chatbots to provide 24-hour

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customer care, streamline transactions, and deliver personalized services, understanding the role of these digital assistants and the level of customer awareness regarding their functionalities is crucial.

In light of the increasing emphasis on digital transformation in the banking sector, this research is timely and relevant. It emphasizes not only the value of chatbots in improving customer service, but also the need for banks to educate their consumers about these technologies. As India continues to advance towards a cashless economy, understanding the dynamics of chatbot usage and customer awareness will be essential for fostering a more inclusive and efficient banking environment.

Literature Review

Digital transformation has fundamentally altered the banking landscape, enabling institutions to leverage technology to improve service delivery and customer interactions. Dr. R. Nalini and S. Yuvasri (2024) emphasize that the infusion of digital technologies, including chatbots, is crucial for enhancing operational efficiency and customer satisfaction in the banking sector. The shift towards digital banking is not merely a transition but a strategic evolution that requires banks to adapt to changing customer needs and market dynamics.

(Bhattacharya & Sinha, 2022) examines how AI integration enhances customer experience in Indian banks, particularly in metropolitan cities. The study focuses on AI-driven banking processes across front, middle, and back-office operations. Chatbots have emerged as a vital tool for enhancing customer service in the banking sector. They provide 24/7 support, allowing customers to access information and services at their convenience. Research indicates that chatbots can significantly improve service quality by offering instant responses to customer inquiries, thereby enhancing customer satisfaction. The ability of chatbots to handle multiple queries simultaneously not only reduces operational costs but also allows human agents to focus on more complex tasks (Hari et al., 2021).

The study by (Hari et al., 2021) & (Khatri, 2021) showed that many customers are still unfamiliar with the functionalities and benefits of chatbots in banking. Despite the advantages of chatbot technology, customer awareness and acceptance remain critical factors influencing their effectiveness. The findings indicate that 56% of respondents used chatbots once a month, while 44% relied on them for quick information on offers and discounts in Mumbai's retail sector. The study concludes that chatbot adoption is growing in India, with positive consumer perceptions regarding its convenience and efficiency.

Karthik (2019) highlights the need for increased awareness among customers to foster greater adoption of digital banking services, including chatbots (Nalini & Yuvasri, 2024). Furthermore, the perceived ease of use and usefulness of chatbots significantly impact customer attitudes towards their adoption (Silva et al., 2023).

Bhattacharya et al. (2022) and Eustaquio-Jiménez et al. (2024) showed in their study that several factors influence customer experience with chatbots in banking. These factors include service quality dimensions such as reliability, responsiveness, and user-friendliness. Research indicates that customers are more likely to engage with chatbots that provide accurate and timely information, enhancing their overall satisfaction. Additionally, trust plays a crucial role in digital interactions; customers must feel secure in sharing personal information with chatbots to fully embrace this technology (Hari et al., 2021).

In the context of Indian commercial banks, the integration of chatbots presents both opportunities and challenges. While the potential for improved customer service and operational efficiency is significant, banks must also address barriers to customer awareness and acceptance. The Reserve Bank of India (RBI) has noted the increasing adoption of AI technologies, including chatbots, in enhancing customer service (B V & Kulkarni, 2024). However, there is a pressing need for banks to invest in customer education and support services to enhance understanding and trust in chatbot technology (B V & Kulkarni, 2024).

The literature underscores the transformative potential of chatbots in the banking sector, particularly in enhancing customer experience and operational efficiency. However, the success of these digital assistants hinges on customer awareness and acceptance. As Indian commercial banks continue to navigate the digital landscape, understanding the dynamics of chatbot usage and customer perceptions will be essential for optimizing service delivery and fostering customer loyalty. Further research is needed to explore the specific factors influencing customer engagement with chatbots in the Indian context, paving the way for more effective digital banking strategies. That's why this study aims to shed light on how chatbots in Indian commercial banks are gaining a foothold.

OBJECTIVES

The following are the objectives that this study aims to achieve while conducting the research:
• To analyse the adoption of chatbot services in Indian private and public commercial banks.
• To understand the awareness and perception of customers towards chatbot services offered by Indian private and public commercial banks.
• To explore the possible linkages between chatbot services offered by banks and their revenue from digital banking operations.

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METHODOLOGY

This exploratory study is divided into two major parts. In the first part, qualitative data is collected from approximately 150 respondents, with a specific focus on the state of Gujarat. The objective is to assess their awareness of chatbot banking services and their receptiveness towards them. The primary data is gathered using a structured questionnaire and is analysed using simple statistical tools.

The second part of the study follows a quantitative approach, analysing the revenue generated from digital banking operations for the financial years 2022-23 and 2023-24. The secondary data is sourced from the official websites of banks and their audited financial statements.

DATA ANALYSIS AND INTERPRETATION

1. Adoption of Chatbot Service in Indian Commercial Banks

Technological advancements in the banking sphere, particularly the rapid growth of digital banking, are a double-edged sword. This statement is supported by a research article from the Bank for International Settlements (May 2024), which not only highlights the benefits of integrating artificial intelligence (AI) and machine learning (ML) in banking—such as improved client experience, enhanced pattern recognition for business expansion, cost efficiencies, greater accuracy and consistency, and the ability to process large and unstructured datasets—but also discusses the risks associated with generative AI.

The identified risks include model risks, where reasoning errors may occur alongside inconsistent responses to the same prompt, data governance challenges, and an increased reliance on third-party AI developers for digital banking solutions, exposing banks to additional risks.

The bottom line is that while AI adoption presents challenges, it is only a matter of time before banks fully incorporate these advancements to remain competitive in an evolving business landscape. The Indian banking structure is also not immune to these changes. To survive in the market, banks must incorporate technological advancements into their business models. One such technological innovation rapidly adopted by Indian commercial banks is AI chatbots. According to the Oxford English Dictionary (2017), a chatbot is "a computer program designed to simulate conversation with a human user." Implementing chatbots in banking is expected to enhance efficiency, provided that customers are receptive to the change.

This section of the study aims to examine how many Indian private and public sector commercial banks have adopted the chatbot model. The following table presents the names of these banks along with their respective Chatbot Assistants.

Table 1: Indian Commercial Banks Offering Chatbot Services

Sr No.	Bank Name	Name of Chatbot	Highlights
1	Bank of Baroda	ADI	Virtual Assistant
2	Bank of Maharashtra	BoMy	Virtual Assistant
3	Canara Bank	AURA	Virtual Assistant, Five Languages
4	State Bank of India	SIA	Digital Assistant
5	UCO Bank	Uday	Digital Assistant, Two Languages
6	Axis Bank Ltd	Axis Aha!	Digital Assistant, Two Languages
7	City Union Bank Ltd	CUB Lakshmi	Digital Assistant
8	Federal Bank Ltd.	Feddy	Digital Assistant, Three Languages
9	HDFC Bank Ltd.	Eva	Digital Assistant, Two Languages
10	ICICI Bank Ltd.	iPal	Digital Assistant
11	IndusInd Bank Ltd	IndusAssist	Digital Assistant
12	Jammu & Kashmir Bank Ltd	JIA	Digital Assistant
13	Karur Vysya Bank Ltd.	Kaaru	Virtual Assistant
14	Kotak Mahindra Bank Ltd.	Keya	Virtual Assistant (only if you are registered)
15	RBL Bank Ltd	RBL care	Digital Assistant
16	South Indian Bank Ltd.	SONA	Digital Assistant
17	Yes Bank Ltd.	yes boat	Digital Assistant

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18	IDBI Bank Ltd.	i-mobot	Social Media Banking Platform (business consultancy)
19	Bank of India	BOI Seva	Digital Assistant, Twelve Languages
20	Central Bank of India	Cent Chanakya	Digital Assistant, **only for back hand staff support**
21	Indian Bank	ADYA	Digital Assistant
22	Tamilnad Mercantile Bank Ltd.	TMBot	Digital Assistant
23	Union Bank of India	UVA	Digital Assistant, Nine Languages, Video chat service

(Author's own contribution)

Fig. 1: Adoption of Chatbot Services in Indian Commercial Banks
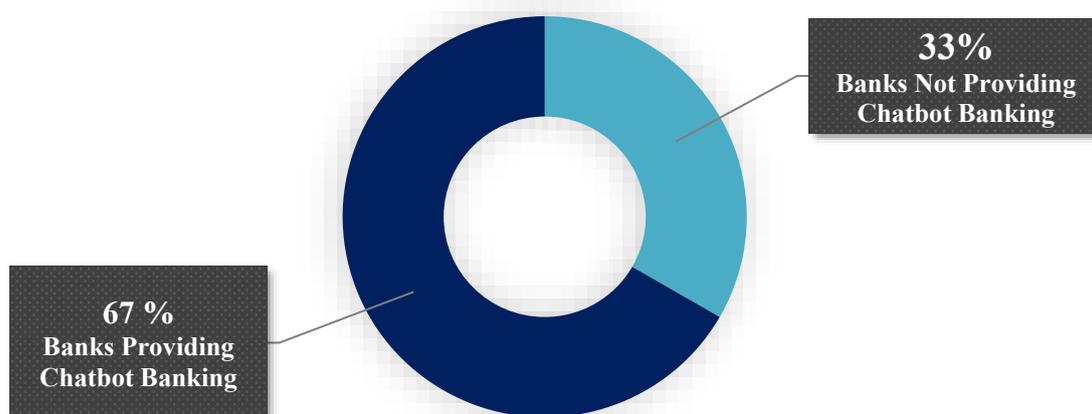
(Author's own contribution)

Among the 33 Indian private and public commercial banks, 67 percent have implemented chatbot services on their websites, while the remaining one-third still rely on WhatsApp banking or customer care services to address customer queries.

Of the two-thirds of banks offering chatbot services, around 60 percent (14) are privately owned, whereas 40 percent (9) are government-owned. However, the functionality of these chatbots varies. Some banks provide advanced conversational chatbots, while others offer limited customer support in a single language. Additionally, certain banks present their chatbots as "Virtual Assistants" with a human-like avatar, whereas others introduce them as "Digital Assistants."

The integration of robotics in Indian banking was pioneered by City Union Bank, which introduced a physical banking robot in its branch to assist customers. However, the first AI-powered chatbot, marking a significant leap in digital banking, was launched by HDFC Bank in 2017, followed by the State Bank of India and ICICI Bank. Over time, the remaining 20 banks have gradually adopted chatbot services.

2. Understand the Awareness and Perception of Customers towards Chatbot Services

We analysed data to understand customer perceptions of chatbot services, a relatively new technology. To gather insights, we conducted a questionnaire and collected responses from 134 individuals, ensuring a diverse range of opinions and experiences. The data was carefully examined to identify common patterns, trends, and key insights regarding customer satisfaction, ease of use, and overall chatbot performance. This analysis provided a clear understanding of what chatbots do well and areas where they can be improved as automated support systems.

Analysis of Demographic Characteristics of sample

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Table 2: Demographic composition

Demographic Composition	Male Using Chatbot	Female Using Chatbot	Males Not Using Chatbot	Females Not Using Chatbot	Total
Below 25	4	9	5	14	32
25 - 34	14	10	25	15	64
35 - 44	2	2	1	3	8
45 - 55	2	1	2	7	12
Above 55	6	0	12	0	18
Total	28	22	45	39	134

(Author's own contribution)

Among all respondents, the highest proportion belongs to the 25–34 age group, followed by those under 25. The male-to-female ratio in the total sample is 73:61. It is notable that the majority of chatbot users are under 35; however, within this age group, the number of non-users exceeds that of users. This challenges the common perception that younger generations are more receptive to new technology than older individuals.

One possible reason for this trend is that a significant portion of this demographic consists of students who are not financially independent and may not actively manage their financial activities, despite having their own bank accounts.

An age group worth highlighting is those above 55. Among the 18 respondents in this category, twice as many have never used chatbot services. However, one-third of them are not only aware of chatbots but have also used them. Regarding gender differences, 64% of the 61 female respondents have never used chatbot services, while only 36% have.

Earnings and Their Influence on Chatbot Usage

Table 3: Chatbot usage across different salary groups

|	Below 1,00,000	1,00,000 - 5,00,000	5,00,000 - 10,00,000	10,00,000 or above	Total
Chatbot Usage Count	21	16	8	5	50
Chatbot Non-Usage Count	30	40	11	3	84
Total	51	56	19	8	134

(Author's own contribution)

The analysis of chatbot adoption across different salary groups reveals distinct patterns. Among chatbot users, the majority earn less than ₹1 lakh per year, with 21 individuals in this category. This suggests that chatbots may be more popular or accessible among lower-income groups. In the ₹1 lakh to ₹5 lakh range, 16 individuals have adopted chatbots, indicating a moderate level of usage. However, chatbot adoption decreases as income rises, with only 8 users in the ₹5 lakh to ₹10 lakh range and just 5 users earning above ₹10 lakh. This trend suggests that higher-income groups may have different priorities or face specific challenges in adopting chatbot services.

For non-users, the majority also belong to lower and middle-income groups. Among them, 30 individuals earn less than ₹1 lakh, while 40 fall within the ₹1 lakh to ₹5 lakh range. In the higher-income brackets, the number of non-adopters is significantly lower, with 11 individuals earning ₹5 lakh to ₹10 lakh and only 3 earning above ₹10 lakh.

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User Insights on Chatbots: Awareness, Satisfaction and Preferences

Fig. 2: User Insights on Chatbots: Awareness, Satisfaction and Preferences
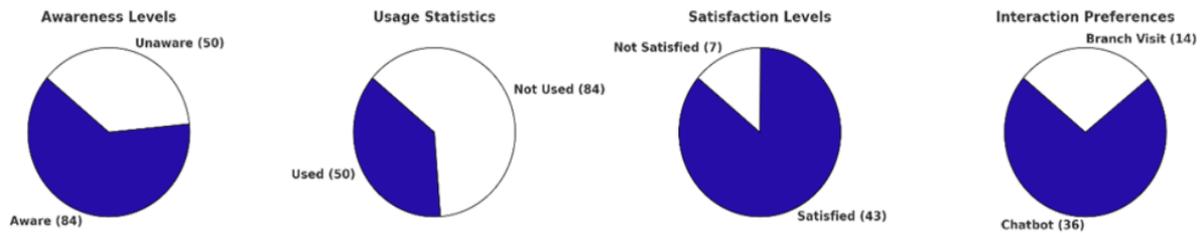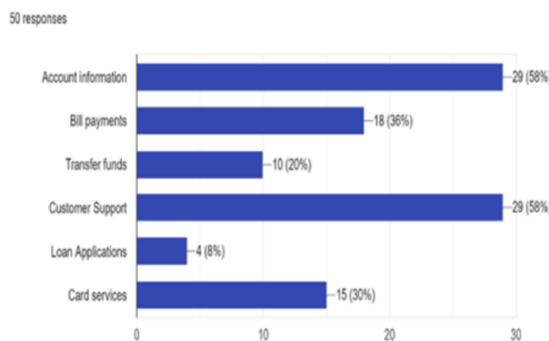

(Author's own contribution)

Out of the total surveyed population, 63% were aware of the chatbot services offered by Indian commercial banks, and among them, 60% had used these services. However, 40% of those aware of chatbots had not used them.

Further analysis revealed that out of 50 chatbot users, 43 were satisfied with the service. Despite this, 7 respondents still preferred visiting a bank branch over using chatbot services. Additionally, 84 respondents had never used chatbot services, indicating that a significant portion of the population has yet to adapt to the concept of chatbot banking.
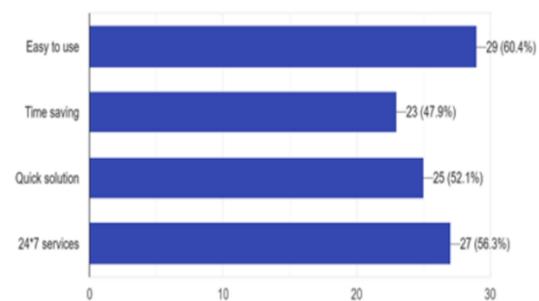
Preferences towards chatbot services offered and factors influencing them:

Fig.3 customer use chatbot services

Fig.4 factors influencing customers to use chatbot

(Author's own contribution)

Customers primarily use chatbot services for accounting information and customer support, with both categories having 29 users. These are the most frequently used features, highlighting chatbots' effectiveness in answering queries and providing financial details. Bill payments follow closely, with 18 users, indicating that chatbots are considered useful for routine transactions. Card services are used by 15 individuals, reflecting a moderate level of engagement for tasks related to credit or debit cards. Fund transfers have fewer users, with only 10, suggesting that this feature may need further promotion.

Loan applications have the lowest usage, with just 4 users, possibly because customers prefer direct assistance for significant financial decisions. Overall, while chatbots offer various benefits, there is still room for improvement in certain features.

Customers are influenced by several factors when choosing to use chatbots. The most significant reason is their ease of use, as simplicity enhances the overall user experience. Another major advantage is their 24/7 availability, allowing customers to access services anytime. Additionally, 25 users value chatbots for providing quick solutions, emphasizing the importance of immediate responses to queries. The time-saving aspect is also a key factor, as real-time interactions enhance efficiency.

Together, these factors highlight why chatbots are becoming an increasingly popular tool for customer interaction and support.

3. Adoption of Chatbot Service and revenue from digital banking operations.
Studies have shown that the adoption of chatbot services in the banking sector not only enhances customer satisfaction but also leads to improved business outcomes for banks (Bhattacharya & Sinha, 2022). This section of the study aims to examine whether these findings hold true for Indian commercial banks during the periods 2022–23 and 2023–24.

To achieve this objective, the relationship between the adoption of chatbot services and the resulting revenue from digital banking operations will be analysed. According to the Reserve Bank of India's guidelines dated April 7, 2022, all Indian commercial banks are required to report the performance of their Digital Banking Segment under Retail Banking. Among the 33 Indian commercial banks, 23 report their revenue from digital banking operations, while the remaining banks have stated in their annual reports that they do not yet have a functional Digital Banking Unit.

Based on the collected data, two groups have been formed. The first group includes banks that report revenue from digital banking operations but do not provide chatbot services (table 4) whereas the Second group consists of banks that report digital banking revenue as well as offer chatbot services (table 5).

A comparison between these groups will help to determine whether banks that offer chatbot services achieve better business results or if chatbots have not yet gained enough traction in banking operations to significantly impact business performance.

Table 4 : Digital Banking Segment's Revenue of Banks not offering Chatbot (in Crores)

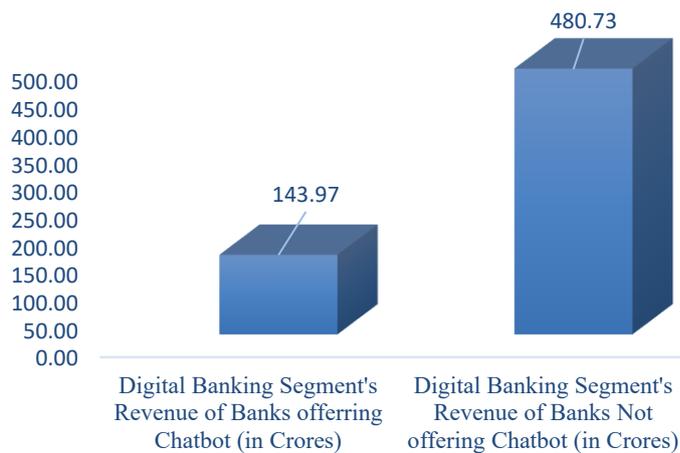| Sr no.	Name of the Bank	2023	2024
1	Punjab and Sind Bank	-	0.17
2	Punjab National Bank	0.02	0.13
3	IDFC Bank Ltd	1,006.65	5845.59
4	Karnataka Bank Ltd	-	0.19
	Total	1,006.67	5,846.08
	Absolute Increase		4,839.41
	Percentage Increase		**480.73**

(Author's own contribution)

Table 5 : Digital Banking Segment's Revenue of Banks offering Chatbot (in Crores)

Sr no.	Name of the Bank	2023	2024
1	Bank of Baroda	0.06	0.55
2	Bank of Maharastra	0.01	0.06
3	Canara Bank	0.15	1.55
4	State Bank of India	3,697.02	5,149.22
5	UCO Bank	-	-
6	Axis Bank Ltd.	15,538.15	26,116.81
7	City Union Bank Ltd.	0.11	0.23
8	Federal Bank Ltd.	903.54	1,501.03
9	HDFC Bank Ltd.	0.64	3.37
10	ICICI Bank Ltd.	6,474.87	32,442.61
11	IndusInd bank*	832.38	1,194.37
12	Jammu & Kashmir Bank Ltd	0.02	0.08
13	Karur Vysya Bank Ltd.	-	0.01
14	Kotak Mahindra Bank Ltd.	305.59	1,536.19
15	South Indian Bank	213.91	679.38
16	Yes Bank	0.01	0.24
17	Bank of India	-	0.26
18	Indian Bank	-	0.18
19	Union Bank of India	566.49	985.02
	Total	28,532.95	69,611.16
	Absolute Increase		41,078.21
	Percentage Increase		**143.97**

(Author's own contribution)

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Fig.5: Percentage Increase in Digital Banking Revenue

(Author's own contribution)

The chart clearly indicates that the percentage increase in revenue from the digital banking segments of banks that do not offer chatbot services (sample size: 4) is higher than that of banks that do provide chatbot services (sample size: 19). A preliminary analysis of this objective suggests that the adoption of chatbot services has not yet resulted in significant financial benefits for banks. This finding is consistent with the conclusions drawn from Objective Two, which highlights that widespread adoption of chatbot services in everyday banking activities is still a long way off. Until this integration is achieved, the financial benefits of chatbots remain unrealized.

CONCLUSION

Chatbot adoption in Indian commercial banks is growing, with 67% integration, primarily for account queries and customer support. While private banks have been more proactive in implementing chatbots, public sector banks are also making progress in their adoption. However, the functionality of these chatbots varies, with some offering advanced conversational capabilities while others provide limited support. The study highlights that customers primarily use chatbots for obtaining account information and customer support, indicating their effectiveness in handling basic banking queries. Ease of use is the key factor driving adoption. Usage is highest among 25-34-year-olds, with males using chatbots more than females. Lower-income groups adopt them more, while higher-income users prefer traditional banking. Despite their benefits, non-users still outnumber users, emphasizing the need for greater awareness, improved functionality, and user confidence in digital banking. The study further examined the impact of chatbot adoption on digital banking revenue. It concluded that, despite the widespread implementation of chatbots in most Indian commercial banks, their adoption has not yet led to significant financial gains. This is primarily because customers still prefer traditional brick-and-mortar banking over chatbot-based services. Financial benefits from chatbot adoption may take time to materialize as customers gradually become more receptive to digital banking practices.

LIMITATIONS

The qualitative analysis is limited to Gujarat, which may not represent customer perceptions across India.
Some banks lack dedicated digital banking units, affecting chatbot adoption and financial impact analysis.
The digital banking revenue analysis is restricted to two financial years, limiting long-term insights because Reserve Bank of India issued guidelines dated April 7, 2022 that all Indian commercial banks are required to report the performance of their Digital Banking Segment under Retail Banking.

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