ROLE OF AI IN IMPROVING CONSUMER SATISFACTION TOWARDS INTERNET BANKING SERVICES IN BHOPAL

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ABSTRACT

There is a constant development in the technology with the advent of Internet Banking Services. Contemporarily, the integration of Artificial Intelligence with the Internet Banking Services has brought a revolution to the banking sector. AI driven technologies such as chatbots, virtual assistants, and predictive analytics, enable banks to offer 24/7 support, instant query resolution, and customized financial advice, significantly reducing response times and operational costs. Moreover, AI-driven customization provides customized banking solutions, such as investment recommendations and spending analyses, catering to individual preferences and enhancing satisfaction. However, certain challenges are being faced by the consumers while using the AI integrated Internet Banking Services, including trust, security, personal interaction and limitations in solving complex queries. Like any other sector, banking sector and even digital banking sector need technological advancements to be at par with others. As AI technology evolves, its role in enhancing internet banking services will continue to expand, fostering a more consumer-centric approach in the banking sector. The paper attempts to explore the role of AI in improving consumer satisfaction by examining its impact on consumer awareness, experience and the challenges faced while using the AI integrated baking services. This study follows descriptive and analytical research and is based on primary data collected through questionnaire from the respondents using Internet Banking Services and have awareness of Artificial Intelligence.

***KEYWORDS**: Internet Banking Services, Artificial Intelligence, Consumer Satisfaction, Customized Services, Consumer- Centric.*

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Introduction

Internet Banking Services are the digital banking services that allows consumers to use various banking services online without the need to visit the branch physically. It enables consumers to access a wide variety of services such as depositing money, bill payments, balance-related enquiry, issuing cheque book, fund transfers, and downloading bank statements. These services are intended to deliver convenience, efficiency, and security, making banking services faster and more accessible. Internet banking services allow a person with location flexibility and 24*7 accessibility. Artificial Intelligence has been a technological revolution in almost every sector of the economy. Like any other sector, banks also focus on consumer satisfaction. The introduction of AI in Internet Banking Services has further improved customer satisfaction by providing instant support and guidance for queries and transactions.

In the digital scenario, where the consumer demands a faster, secure and customized service, AI can play a crucial role. Artificial Intelligence in internet banking services operates through data

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analysis, automated decision- making, and pattern recognition which helps in analysing consumer behaviour, and transaction patterns. This also helps in fraud detection. The most useful contribution of AI to improve consumer satisfaction in internet banking is through chatbots and virtual assistants. These tools can guide the consumers through various banking services. AI-driven virtual assistants can address customer inquiries instantly, delivering prompt and accurate responses to common questions and concerns. Available 24*7, chatbots eliminate the need for customers to wait for business hours to receive support. Additionally, they can manage routine tasks such as balance checks and fund transfers, allowing human agents to dedicate their time to more complex customer issues.

Literature Review

Narang A. et. al. (2024), the study is based on real- world examples that shows the way AI improves efficiency, accuracy, and satisfaction in the areas of fraud detection and risk management. The study observes the application of Artificial Intelligence in banks. It aims to identify the merits and drawbacks of AI integration in the financial sector. It shows how AI has improved decision making, reduced operational costs and increased the overall profitability. AI driven tools like, chatbots, provide customers with fast, 24*7 and customized support which will enhance customer satisfaction,

Noreen U. et. al. (2023), the study attempts to explore the perspective of customers on the adoption of AI in banking services. The study is based on the survey to collect data from five Asian countries i.e., Pakistan, China, Iran, Saudi Arabia and Thailand with a total of 799 respondents. The result shows that the factors like awareness, attitude, norms, perceived usefulness and the knowledge of AI has a positive relationship with adoption. However, perceived risk showed a negative relationship with the willingness to adopt AI.

Shaikh A. A. et. al. (2023), the study investigates the customer satisfaction based on Artificial Intelligence driven banking services in India. The focus is whether the customers perceive AI as a reliable substitute to traditional banking. The data has been collected through 189 respondents of State Bank of India, Axis Bank, Punjab National Bank and HDFC Bank. The findings show that AI improves customer experience by providing accessibility and convenience. However, human interaction is still essential, as many customers still find human expertise satisfying rather than any technological advancement. The study emphasises on the complementary nature of AI instead of becoming a human replacement. A balance should be maintained between technology and personized services. Altogether, it focuses on the integration of AI with human expertise to enhance customer satisfaction.

Shaheema Hameed and Abhinav Nigam (2023), the study is based on a survey conducted on 272 respondents belonging to Generation Z in India and their perception for AI based internet banking services. The result shows that the usage of AI based internet banking services among Gen Z is low. Though being tech- savvy, Gen Z customers does not benefit in using the services. Despite of appreciating internet banking services, Gen Z prioritizes innovative interpersonal interaction and deep insights into the services.

Geetha A (2021), conducted a study on the application of Artificial Intelligence in the banks of Chennai. It emphasises on how banks use financial data through online banking system to monitor, predict and respond to the consumer behaviour effectively. The results show that private banks employ various artificial intelligence-based services to improve customer experience. It also highlights the need significance of customer engagement by the banks and also provide advanced training programs to its staff. These initiatives will aim to improve the application of AI to enhance service quality in the banking sector.

Mogaji E. et. al. (2021), this study deals with the adoption and engagement of consumers with chatbots used in banking to conduct financial transactions. A qualitative approach has been used on 36 residents of Nigeria. The findings show that the four key factors from Unified Theory of Acceptance and Use of Technology framework effectively explain how consumers interact with the chatbot system in banking. Age and technological experience also play an important role in the facilitation of chatbot usage.

Kaur N. et. al. (2020), the research aims to explore the concept of AI in banking. with the help of technology, many tasks performed by humans are automated which reduces errors and improves efficiency. The study uses exploratory and descriptive design that describes the present status of AI in banking. data has been collected through a survey of 122 respondents from selected banks. The result provides valuable insights into the impact of Artificial Intelligence on the operations of the bank and customer experience.

Objectives of the Study

- To know the level of awareness of the consumers towards AI based Internet Banking Services.
- To understand the importance of reason behind the decisions given by AI system on consumers understanding.
- To identify the factors that improves consumer's trust on AI based internet banking services.
- To know the challenges faced by the consumers while using AI based Internet Banking Services.
- To understand the level of satisfaction of the consumers towards AI based Internet Banking Services.

Research Methodology

The study intends to understand the role of AI in improving consumer satisfaction towards internet banking services in Bhopal. The method of sampling used in the study is convenience sampling. Respondents are those consumers who reside in Bhopal and use internet banking services. Descriptive and analytical research design has been used. Primary and Secondary data is collected for the purpose of the study. For collecting primary data, a structured questionnaire was prepared and distributed. Information from various research journals and articles are studied for secondary data collection. The size of the sample consists of 240 internet banking users residing in Bhopal. Analysis and interpretation has been done on the basis of pie charts and bar charts. For the purpose of statistical analysis, percentage distribution table is used. For hypothesis testing Chi- Square test is used.

Analysis and Interpretation

Table 1: Gender

Gender	No. of respondents	Percentage
Male	112	46.67
Female	128	53.33
Total	240	100

The above data shows that the majority of internet banking users i.e. 46.67% are male whereas, 53.33% of the internet banking users belong to the female category.

Table 2: Age

Age	No. of Respondents	Percentage
18- 25	80	33.33
26- 35	72	30
36- 45	32	13.33
46-55	56	23.33
56- 65	0	0
Total	240	100

The data reveals that 33.33% of the respondents belong to the age 18- 25 years. About 30% are between 26- 35 years. 13.33% belong to 36- 45 years and the remaining i.e. 23.33% belongs to 46-55 years of age.

Table 3: Employment Status

Qualifications	No. of Respondents	Percentage
Student	64	26.67
Self Employed	40	16.67
Private Sector Employee	88	36.67
Public Sector Employee	16	6.67
Others	32	13.33
Total	240	100

Majority of the respondents i.e. 36.67% are private sector employees followed by 26.67% students and 16.67% self-employed. About 13.33% of the respondents are other professionals and the remaining 6.67% are public sector employees.

Table 4: Consumer of the Existing Bank

Years	No. of Respondents	Percentage
Less than 1 year	0	0
1-3 years	40	16.67
4-6 years	48	20
7-9 years	48	20
10 years and more	104	43.33
Total	240	100

The data above shows that 16.67% of the respondents have been the consumer of their existing bank for 1-3 years; about 20% respondents for 4-6 years; 20% respondents for 7-9 years; Majority of the respondents i.e., 43.33% have been the consumer of their existing bank for 10 years and more.

Table 5: Use of Internet Banking Services

Do you use Internet Banking Services provided by your bank?	Yes	No
	240 (100%)	0 (0%)

The above data reveals that 100% of the consumers use internet banking services provided by their banks.

Table 6: Frequency of Internet Banking Usage

Frequency	No. of Respondents	Percentage
Usually	32	13.33
Sometimes	80	33.33
Occasionally	72	30
Rarely	56	23.33
Total	240	100

The data above shows that 13.33% of the respondents use internet banking services usually followed by 33.33% users who sometimes use it for transactions. 30% respondents occasionally use internet banking services and the remaining 23.33 use internet banking services rarely.

Table 7: Awareness of AI integrated Internet Banking Services

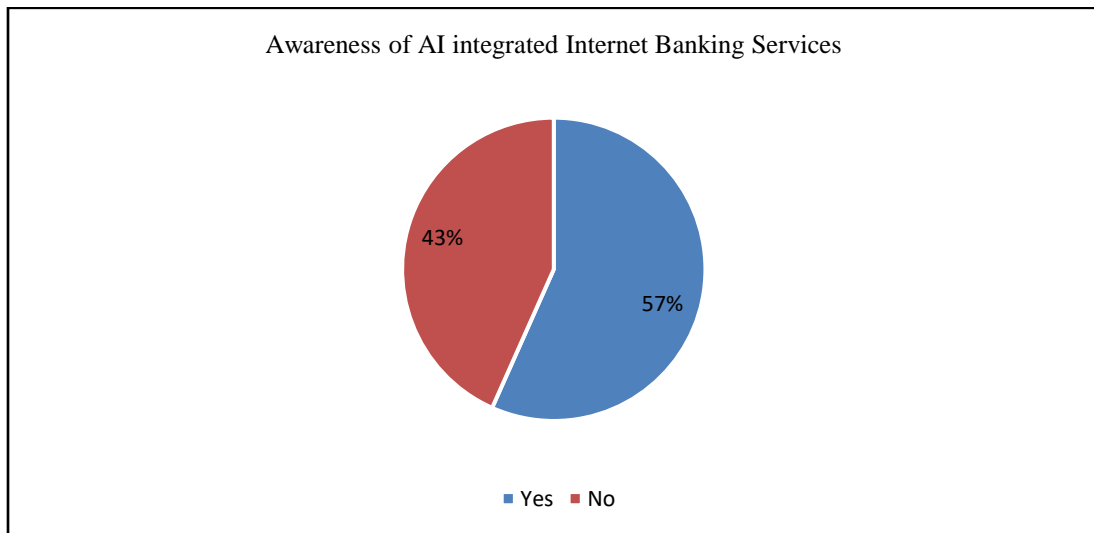| Are you aware of the AI integrated Internet Banking Services provided by your bank?	Yes	No
	136 (56.67%)	104 (43.33%)

Fig. 1: Awareness of AI integrated Internet Banking Services

The above data reveals that 56.67% of the consumers are aware of AI integrated internet banking services provided by their banks, whereas about 43.33% are still not aware.

Table 8: Interaction with of AI driven Internet Banking Services

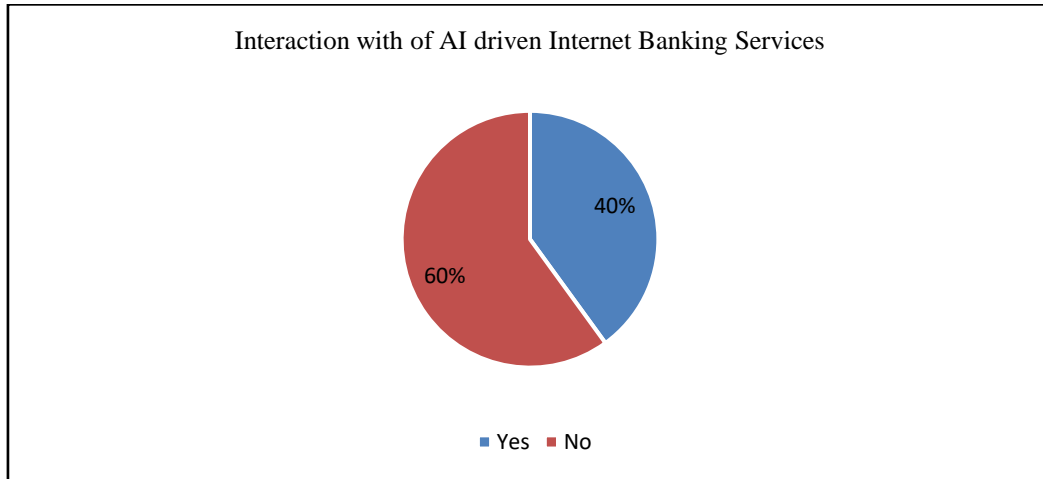|	Yes	No
Have you ever interacted with AI based internet banking tools (ex: chatbots, virtual assistant etc.)	96 (40%)	144 (60%)

Fig. 2: Interaction with of AI driven Internet Banking Services

The above data shows that 40% of the consumers interact with the AI based internet banking tools (ex: chatbots, virtual assistant etc.) provided by their banks. About 60% AI based internet banking tools provided by their banks.
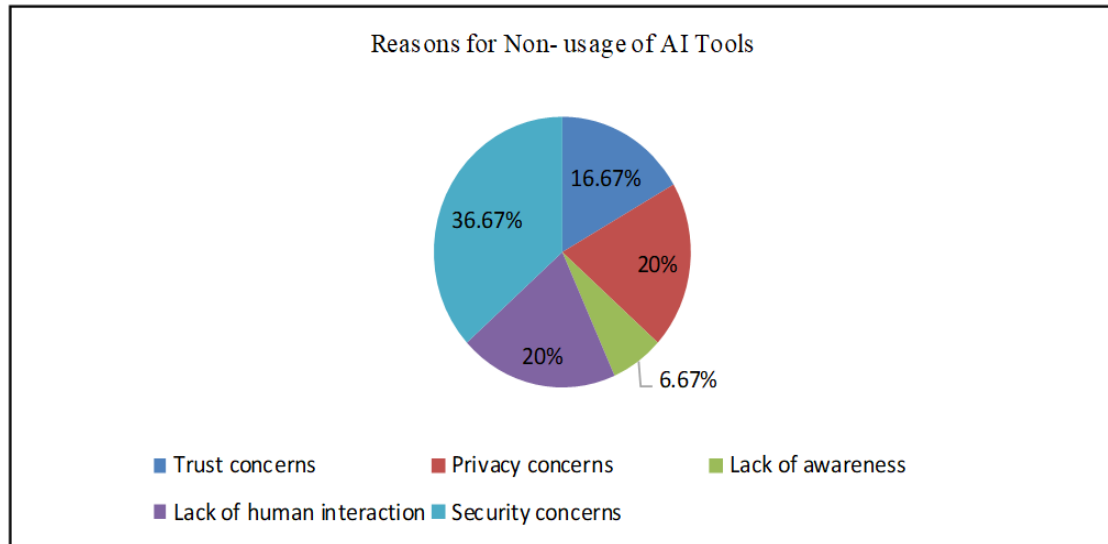

Fig. 3: Reasons for Non- usage of AI Tools

The above chart reveals that the consumers do not interact with the AI based internet banking tools (ex: chatbots, virtual assistant etc.) provided by their banks due to some concerns. About 16.67% and 20% hesitate these tools because of trust concerns and privacy concerns respectively. 6.67% respondents feel a lack of awareness; 20% of the users believe that there is a lack of human interaction and the majority i.e., 36.67% of the users are concerned about the security.

Table 9: Importance of Understanding the Reason Behind AI based Decisions

How important it is for you to understand the reason behind AI based decisions?	No. of Respondents	Percentage
Very Important	112	46.67
Somewhat Important	72	30
Neutral	32	13.33
Not very Important	24	10
Not important at all	0	0
Total	240	100

Majority of the respondents i.e., 46.67% believe that it is very important to understand the reasons behind the decisions given by AI for the queries asked by the user. About 30% users feel that understanding the reason is somewhat important followed by 13.33% users who are neutral. 10% do not find it necessary to understand the reason.

Table 10: Clarity of the decisions given by AI

Do you feel your bank's AI systems explain their decisions clearly?	No. of Respondents	Percentage
Yes, always	16	6.67
Sometimes	200	83.33
Rarely	8	3.33
Never	16	6.67
Total	240	100

The above data shows the opinions of the internet banking users over the clarity of decisions given by AI systems as a response of the queries made by them. About 6.67% believe that the decision is given by AI are explained clearly whereas 83.33% believe that the decisions given are sometimes clear. 3.33% feels that the decisions are rarely explained and 6.67% feel that the reasons are never explained clearly.

Table 11: Effectiveness of the AI based Chatbots/ virtual Assistant in Addressing Queries

How effective are AI-based chatbots or virtual assistants in addressing your queries?	No. of Respondents	Percentage
Very Effective	32	13.33
Somewhat Effective	72	30
Neutral	112	46.67
Not Very Effective	24	10
Very Ineffective	0	0
Total	240	100

The above table shows that 13.33% of the respondents find the AI chatbots/ virtual assistants effective in addressing queries followed by 30% users find it somewhat effective. Majority i.e., 46.67% are neutral and the remaining 10% find the tools not very effective in addressing their queries.
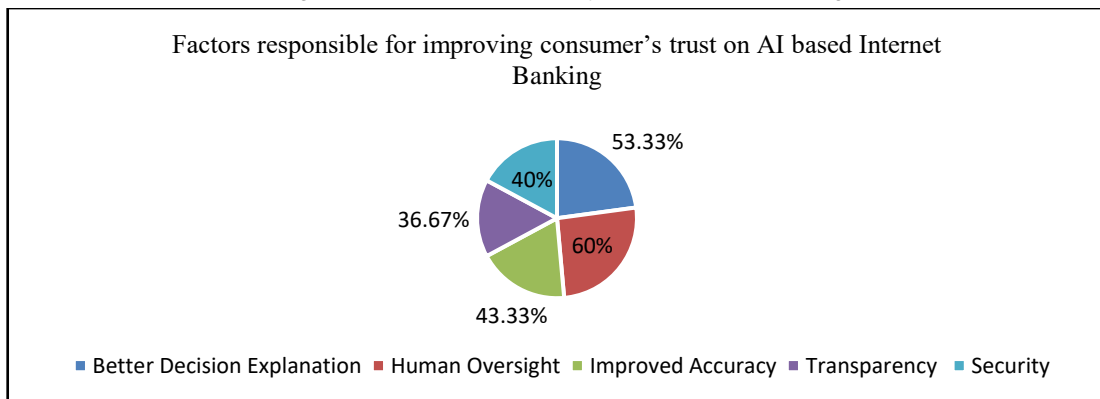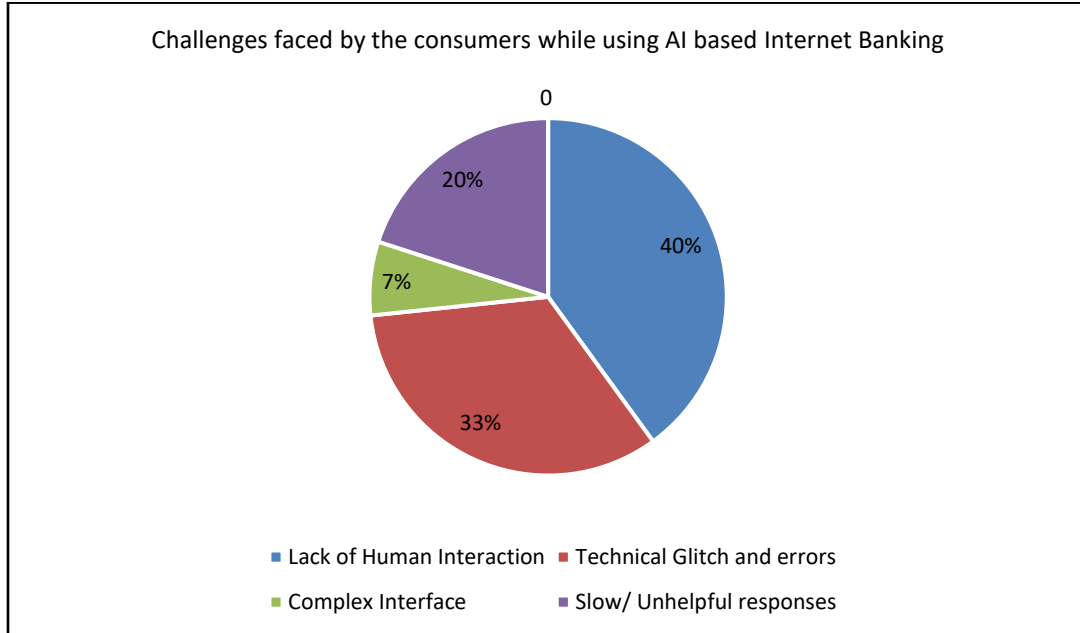

Fig. 4: Factors Responsible for Improving Consumer's Trust on AI based Internet Banking

The above data has been obtained from the respondents on the factors that they feel are responsible to improve their trust on AI based Internet Banking Services. Each respondent has chosen various factors.

Fig. 5: Challenges faced by the consumers while using AI based Internet Banking

Challenges faced by the consumers while using AI based Internet Banking

0

20%

7%

40%

33%

■ Lack of Human Interaction   ■ Technical Glitch and errors

■ Complex Interface   ■ Slow/ Unhelpful responses

Most of the users face difficulty as there is lack of human interaction (40%) and technical glitches (33.33%). 20% feel that the interface is complex and the rest 7% feel that the responses are slow or unhelpful.

Table 12: Transparency of AI based Internet Banking

Do you Agree that the transparency of AI based Internet Banking has improved your level of satisfaction?	Agree	Do not agree
	192 (80%)	48 (20%)

Majority (80%) of the respondents agree that AI based Internet Banking has improved their level of satisfaction and the rest of them do not agree (20%).

Table 13: Speed of Issue Resolving by AI based Support Systems

How satisfied are you with the speed of issue resolution by AI-driven support systems?	No. of Respondents	Percentage
Very Satisfied	8	3.33
Satisfied	104	43.33
Neutral	128	53.33
Not Very Satisfied	0	0
Dissatisfied	0	0
Total	240	100

46.67% of the respondents feel that AI has improved the speed of resolving issues in internet banking and the rest of them are neutral (53.33%).

Table 14: Overall Satisfaction towards AI based Internet Banking Services

Do you think that the Artificial Intelligence has improved your level of satisfaction towards Internet Banking?	Yes	No
	224 (93.33%)	16 (6.67%)

Majority (93.33%) of the respondents agree that AI based Internet Banking has improved their level of satisfaction and the rest of them do not agree (6.67%).

Hypothesis and Testing

H_0:   There is no significant relation between Age and Awareness of AI based Internet Banking Services.

H_1:   There is a significant relation between Age and Awareness of AI based Internet Banking Services.

- **Chi- Square Test:** Relationship between Age and Awareness of the respondents.

Table 15: Chi- Square Test

Age	Awareness of AI based Internet Banking Services			Inference
	Yes	**No**	**Total**	
18- 25	40	40	80	X^2 = 13.095
26- 35	56	16	72	Df = 4
36- 45	16	16	32	Level of Significance = 0.05
46- 55	32	24	56	
56- 65	0	0	0	Table value = 9.488
Total	144	96	240	

According to the statistical test of Chi- Square the results obtained is that the calculated value is greater than the table value i.e. Calculated value = 13.095 > Table value = 9.488 at a 5% level of significance. Hence, the null hypothesis is rejected and the research hypothesis is accepted. It can be inferred that 'There is a significant relation between Age and Awareness of AI based Internet Banking Services.'

H_0:   There is no significant relation between the Understanding of the decisions given by AI support systems and the Clarity of explanation of the decision made by AI support systems.

H_1:   There is a significant relation between the Understanding of the decisions given by AI support systems and the Clarity of explanation of the decision made by AI support systems.

- **Chi- Square Test:** Relationship between Understanding and Clarity of AI based decisions

Table 16: Chi- Square Test

Importance of understanding the AI based decisions	Clarity of explanation of decisions					Inference
	Yes, always	**Sometimes**	**Rarely**	**Never**	**Total**	
Very important	16	80	8	8	112	X^2 = 37.21
Somewhat important	-	64	-	8	72	Df = 12
Neutral	-	32	-	-	32	Level of Significance = 0.05
Not very important	-	24	-	-	24	
Not important at all	-	-	-	-	0	Table value = 21.026
Total	16	200	8	16	240	

According to the statistical test of Chi- Square the results obtained is that the calculated value is greater than the table value i.e. Calculated value = 37.21 > Table value = 21.026 at a 5% level of significance. Hence, the null hypothesis is rejected and the research hypothesis is accepted. It can be inferred that 'There is a significant relation between the Understanding of the decisions given by AI support systems and the Clarity of explanation of the decision made by AI support systems.'

H_0:   There is no significant relation between effectiveness of Chatbot/ Virtual Assistant in addressing queries and the speed of issue resolution by AI support systems.

H_1:   There is a significant relation between effectiveness of Chatbot/ Virtual Assistant in addressing queries and the speed of issue resolution by AI support systems.

- **Chi- Square Test**: Relationship between Effectives of Chatbot/ Virtual Assistant and Speed of query resolution

Table 17: Chi- square test

Effectiveness of Chatbot/ Virtual Assistant in query resolution	Speed of query resolution					Inference
	Very satisfied	Satisfied	Neutral	Not very satisfied	Dissatisfied	
Very important	8	16	8	-	-	X^2 = 78.26
Somewhat important	-	40	32	-	-	Df = 16
Neutral	-	32	80	-	-	Level of
Not very effective	-	16	8	-	-	Significance
Very effective at all	-	-	-	-	-	= 0.05
Total	8	104	128	0	0	Table value = 26.296

According to the statistical test of Chi- Square the results obtained is that the calculated value is greater than the table value i.e. Calculated value = 78.26 > Table value = 26.296 at a 5% level of significance. Hence, the null hypothesis is rejected and the research hypothesis is accepted. It can be inferred that 'There is a significant relation between effectiveness of AI support systems in addressing queries and the speed of issue resolution by AI support systems.'

H₀: There is no significant relation between transparency and satisfaction towards AI based Internet Banking Services.

H₁: There is a significant relation between transparency and satisfaction towards AI based Internet Banking Services.

- **Chi- Square Test:** Relationship between Transparency and Satisfaction of the respondents

Table 18: Chi- square test

Transparency of AI based Internet Banking Services	Satisfaction towards AI based Internet Banking Services			Inference
	Yes	No	Total	
Agree	192	0	192	X^2 = 68.56
Do not Agree	32	16	48	Df = 1
Total	224	16	240	Level of Significance = 0.05 Table value = 3.841

According to the statistical test of Chi- Square the results obtained is that the calculated value is greater than the table value i.e. Calculated value = 68.56 > Table value = 3.841 at a 5% level of significance. Hence, the null hypothesis is rejected and the research hypothesis is accepted. It can be inferred that 'There is a significant relation between transparency and satisfaction towards AI based Internet Banking Services.'

Findings

- Majority i.e., 33.33% of the respondents belong to the age of 18- 25.
- Majority i.e., 53.33% of the respondents belong to the female category.
- Most of the respondents are Private Sector Employees (36.67%).
- Maximum (43.33%) respondents are the consumers of their existing bank for more than 10 years.
- More than half of the respondents (56.67%) are aware of AI based Internet Banking Services.
- 46.67% of the respondents feel the importance of understanding the reasons behind the decision given by AI in Internet Banking and 83.33% feel that the decisions are sometimes explained clearly.
- 60% of the respondents feel that Human Oversight is one of the important factors that can improve their trust towards AI based Internet Banking.
- Lack of Human Interaction (40%) and Technical Glitch (33.33%) are the most faced challenges of IB consumers.
- Transparency and speed of AI plays an important role in improving the overall satisfaction of the IB consumers.

Suggestions

- Most respondents are the consumers of their existing bank for more than 10 years, but are still not aware of AI based internet banking. For this, Banks should launch awareness programs to make them aware of the technological upgradation through social media etc.

- Some consumers are aware of AI based internet banking services but they still look for human oversight for the resolution of their issues. Banks should provide a simple interface in order to make consumers feel at ease. Also, when it comes to security, they trust bank staff to maintain proper financial data and resolve their queries.

- Simple language should be used for the consumers so that they can easily understand the AI based internet banking services and use them efficiently. Also, AI services should be made available in various regional languages.

- Sometimes the chatbots/ virtual assistants associated with the banking website/ application, do not provide the accurate answer for the problems. There is a loop of similar questions being asked to the consumer but they do not get proper responses. To solve this, banks must update their AI support tools from time to time keeping the needs of consumers in mind.

- To ensure consumer trust, banks should maintain proper security and privacy measures like multi-factor authentication, biometric etc.

- AI based internet banking should provide accurate and reliable explanation of the decisions given by it to the consumers.

- Banks should take feedback from its consumers from time to time to ensure consumer- centric internet banking. Technical glitches, slow and unhelpful responses should be looked into and rectified.

- AI based internet banking should analyse consumer behaviour and offer customized financial products. It should also provide real-time notifications for unusual account activity or upcoming bill payments.

Conclusion

AI based internet banking services have transformed the banking sector by enhancing customer experience, improving security, and streamlining financial management. Through customized recommendations, automated assistance, fraud detection, and predictive analytics, AI ensures faster, safer, and more efficient banking operations. However, human oversight remains crucial as customers often seek personalized support for complex issues that AI cannot fully address. A balance between automation and human interaction to be maintained that can improve trust and customer satisfaction. Additionally, training staff to collaborate with AI tools can enhance service efficiency and empathy in customer interactions. Banks must continuously adapt and innovate with AI-driven solutions to meet the growing expectations of tech-savvy customers.

Limitations

The scope of this study is limited to the Bhopal, Madhya Pradesh and the size of the sample is 240 respondents who use internet banking services and are aware of AI based services. Any study further could be done with a larger sample size and in various regions. The chi-square test has been used in the current study to test the hypothesis. Therefore, any further research may incorporate other hypothesis-testing techniques.

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