

A Study on the Impact of Artificial Intelligence Applications on Customer Perception in the Banking Industry: With Special Reference to Greater Chennai

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Abstract—Artificial Intelligence (AI) is progressively revolutionising the banking sector via intelligent client assistance, automated services, fraud identification, tailored offerings, and AI-facilitated digital transactions. In light of this context, the current research investigates the influence of AI technologies on consumer perception within the banking sector, specifically focusing on Greater Chennai. The research investigates consumers' recognition and utilisation of AI-driven financial services and assesses the impact of perceived utility, convenience, trust, security, personalisation, and service excellence on customer perception and satisfaction. A study design that is both descriptive and analytical was employed, utilising primary and secondary data. Primary data were gathered from 255 banking clients in Greater Chennai via a structured questionnaire and examined employing Percentage Analysis, Cronbach's Alpha, KMO and Bartlett's Test, Exploratory Factor Analysis, Chi-square, Independent Samples t-test, One-Way ANOVA, Pearson Correlation, and Multiple Regression Analysis. The factor analysis revealed robust sampling adequacy (KMO = 0.891; Bartlett's $\chi^2 = 2768.425$, df = 435, $p < 0.001$). Pearson correlation analysis revealed substantial positive correlations among the primary dimensions, with coefficients varying from $r = 0.594$ to 0.756 ($p < 0.01$). The multiple regression analysis revealed significant explanatory capability ($R = 0.846$; $R^2 = 0.716$; Adjusted $R^2 = 0.710$; $F = 125.56$, $p < 0.001$). The results underscore the significance of utility, accessibility, reliability, safety, customisation, and service excellence in influencing client views on AI-driven banking services. The research indicates that financial institutions must to enhance AI security, clarity, customisation, service agility, and suitable human assistance. The research indicates that a client-focused strategy for AI implementation can improve customer trust, contentment, and acceptance of AI-driven financial services in Greater Chennai.

Index Terms—AI Utilisations, Consumer Perspective, Client Contentment, Confidence, Safety, Customisation, Service Excellence, Online Banking, Greater Chennai.

I. INTRODUCTION

The financial sector is seeing swift changes due to the rising implementation of digital technologies, especially Artificial Intelligence (AI). Artificial intelligence has emerged as a crucial component of contemporary banking services, facilitating functions like chatbots, virtual assistants, fraud detection, tailored services, automated customer support, and transaction security. These applications have transformed customer engagement with banks by enhancing the speed, convenience, and accessibility of many services via digital platforms. The increasing adoption of AI prompts significant enquiries on client perceptions and acceptance of technology-based financial services. Customer impressions may be influenced by elements such as service efficacy, customisation, security, user-friendliness, and the calibre of AI-driven customer assistance. Their encounters with these services may affect their confidence, contentment, and propensity to persist in utilising digital banking services. Consequently, comprehending AI via the lens of the consumer is crucial for creating efficient and client-focused financial solutions. Greater Chennai offers an appropriate environment for analysing these advancements due to its varied demographic and enhanced accessibility to digital banking options and technology-driven financial services. Consumers in the area vary in their demographic traits, banking inclinations, and degrees of digital literacy. In light of this context, the current research investigates the

influence of AI technologies on consumer perceptions within the banking sector, specifically focusing on Greater Chennai, and aims to offer valuable insights for enhancing customer-oriented AI-driven banking services.

II. STATEMENT OF THE PROBLEM

The fast integration of Artificial Intelligence (AI) has resulted in considerable transformations in the provision of banking services. Financial institutions are progressively using AI-driven technologies including chatbots, virtual aides, fraud detection mechanisms, tailored services, automated client support, and advanced security functionalities to enhance operational efficiency and consumer satisfaction. While these applications provide enhanced convenience and expedited service, their effective implementation is mostly contingent upon users' comprehension, experience, trust, and acceptance of AI-driven banking services. From the viewpoint of the consumer, apprehensions regarding data confidentiality, transaction safety, dependability, precision of automated replies, user-friendliness, and restricted human engagement could affect their overall impression of AI-driven banking. Clients may vary in their degree of awareness and experience with AI applications based on their demographic and financial attributes. Consequently, technological progress by itself cannot ascertain the efficacy of AI in banking; comprehending customer perception is also crucial. Greater Chennai, characterised by its varied clientele and increasing adoption of digital banking, offers a suitable environment for exploring these matters. Nonetheless, it is essential to comprehend how consumers in the area view AI programs and whether elements like efficiency, personalisation, security, customer assistance, and user-friendliness affect their trust and contentment. Consequently, the current research investigates the influence of AI implementations on consumer perception within the banking sector, particularly focusing on Greater Chennai.

III. LITERATURE REVIEW

The systematic literature study by Hentzen, Hoffmann, Dolan, and Pala (2022) examined AI in customer-facing financial services. The study also

recommended more theoretically grounded AI research and customer-facing AI. This remark is pertinent to the present study since customer impression comprises usefulness, reliability, security, personalisation, service quality, and trust, not only adoption intention.

Chang, Park, and Dinh (2026) studied algorithmic financial advice confidence in AI-enabled financial services. The findings show that trust and perceptions of AI competence and benevolence affect financial self-efficacy and technology adoption in human–AI financial interactions. The study emphasises the relational aspect of AI-enabled financial services beyond ease and efficiency. Banking consumers handle sensitive financial data and may need confidence in AI systems' reliability, competency, and objectives.

Othayoth and Khanna (2024) evaluated how Indian bank chatbot services affect customer satisfaction and value. The researchers assessed chatbot service quality in seven areas: functionality, ease, security, design, customisation, enjoyment, and assurance. Chatbot service quality affects client satisfaction and value, according to their research. The study is important because it goes beyond asking customers if they use AI to investigate how they rate AI-based banking services.

Shaikh, Kumar, Mishra, and Elahi (2024) examined Indian AI-enabled banking customer satisfaction. AI may make banking more accessible, convenient, and time-efficient, according to the research. The study found that clients still preferred human service over digital service. This argues that AI should not be explored just as a replacement for human contact. Customers may rate AI based on how well it complements human banking.

Sharma and Singh (2024) examined Indian bank clients' AI adoption intentions. The findings supported the Technology Acceptance Model and showed that multiple technological and perceptual aspects influence customer AI adoption decisions. The study shows the importance of customer-level aspects in AI adoption, making it relevant to the current research. Intention to adopt and overall consumer perception are different ideas; hence further study is needed to examine customer impressions of AI applications.

Alnaser, Rahi, Alghizzawi, and Ngah (2023) examined whether AI-enabled digital banking may

boost user satisfaction and acceptance. Their findings linked consumer happiness to expectation confirmation, perceived performance, visual appeal, problem-solving capacity, and communication quality. The study found that the model explained a lot of digital-banking happiness and acceptance.

Deepthi et al. (2022) evaluated AI-driven banking and financial technologies in India, focusing on customer satisfaction, employee AI knowledge, data security, and third-party partnerships. The findings showed that AI can cut costs and improve customer experience, but implementation must include consumer satisfaction and organizational skills. Research also showed that AI use in Indian banking was low compared to wealthy nations. Although its respondents were employees, the study provides useful national evidence. Thus, a Greater Chennai customer-focused study might examine how customers see AI-enabled financial services.

Mor and Gupta (2021) explored how AI improves Indian commercial banks' technical efficiency. They studied AI chatbots, virtual assistants, and automated banking. The authors observed that AI adoption reduced technical inefficiencies, mainly through internal decision-making and operational procedures. The study found that AI affects cost efficiency and customer service in banking.

Eren (2021) examined Turkish banking chatbot consumer satisfaction. The results showed that chatbot performance, trust, and business reputation greatly affected consumer happiness. Customer expectations and confirmation did not directly effect satisfaction, but they did alter perceived performance. The study shows that clients evaluate AI-enabled financial services based on performance and trustworthiness, not just availability.

In 2021, Mogaji et al. explored how emerging market consumers use banking chatbots. This study demonstrated that performance expectancy, effort expectancy, social influence, and facilitating factors affected consumers' banking chatbot interactions. Additionally, perceived knowledge, responsiveness, and security were crucial.

IV. RESEARCH GAP

AI-powered chatbots, virtual assistants, automated services, and digital banking apps are revolutionising the banking business, according to research.

Customer perception which includes usefulness, convenience, trust, security, personalisation, reliability, and service experience has received little attention. Indian studies have mostly concentrated on individual cities or banking institutions, leaving little data about Greater Chennai banking customers. In addition, many past studies focused on individual AI applications, like chatbots, rather than generally addressing AI applications. Thus, modern customer-focused research is needed to determine how AI applications affect customer perception and the main aspects affecting customers' opinion of AI-enabled banking services. This study fills this gap by focusing on Greater Chennai banking consumers.

V. OBJECTIVES OF THE STUDY

1. To examine the awareness and usage of AI applications among banking customers in Greater Chennai.
2. To analyse customers' perception towards AI-enabled banking services in Greater Chennai.
3. To study the impact of AI applications on customer perception and satisfaction.
4. To identify the factors influencing customers' perception of AI-enabled banking services in Greater Chennai.

Hypotheses of the Study

1. H₁₁: There is a significant association between the demographic characteristics of banking customers and their awareness and usage of AI applications in Greater Chennai.
2. H₁₂: There is a significant difference in customers' perception towards AI-enabled banking services based on their demographic characteristics in Greater Chennai.
3. H₁₃: There is a significant relationship between AI applications and customer perception and satisfaction towards banking services in Greater Chennai.
4. H₁₄: Perceived usefulness has a significant influence on customers' perception of AI-enabled banking services.

Methodological Approach to Research

The research technique offers an organised foundation for executing the current investigation. It outlines the methods employed for gathering,

evaluating, and interpreting data to fulfill the study's aims. Employing suitable scientific methodologies enhances the credibility, validity, and reliability of study outcomes. The current research employs both primary and secondary data to analyse the influence of Artificial Intelligence (AI) applications on consumer perceptions within the banking sector, specifically focusing on Greater Chennai.

Attributes of Inquiry

This research employs both descriptive and analytical methodologies. The descriptive approach is employed to evaluate the cognisance, utilisation, and viewpoint of banking clients about AI applications and AI-enhanced banking services in Greater Chennai. The analytical approach is employed to investigate the correlation between AI applications and consumer perception, customer satisfaction, and the determinants affecting customers' views on AI-enhanced financial services. It additionally investigates the correlation between several demographic traits and consumers' views on AI applications.

Sampling Technique

The research used Proportionate Stratified Random Sampling to represent banking clients from various regions in Greater Chennai. Greater Chennai is segmented into appropriate geographical zones for the purpose of sampling. The participants are chosen in proportion to the designated areas to guarantee sufficient representation of clients from various regions of Greater Chennai. In each designated area, banking clients are contacted and participants are chosen by a random sample method. This sampling technique ensures equitable representation of the research area and enhances the dependability and applicability of the results.

Sample Size

The sample size is established according to the study's aims, the characteristics of the research, and the statistical methods intended for data evaluation. The research investigates the correlation between several elements related to AI applications and consumer perception, leading to the selection of 255 participants for the study. The participants are chosen by Proportionate Stratified Random Sampling to

guarantee adequate representation of banking clientele from various regions of Greater Chennai.

Table 1.1 Distribution of Sample Respondents

S. No.	Study Area / Zone	Number of Respondents
1	North Chennai	51
2	South Chennai	51
3	Central Chennai	51
4	West Chennai	51
5	East Chennai	51
Total		255

Source: Primary Data

Sources of Data

Primary data is gathered directly from banking clients in Greater Chennai via a systematic questionnaire. The survey examines participants' knowledge, utilisation, and views regarding AI applications in the banking sector, encompassing factors like efficacy, ease, trustworthiness, security, customisation, and service excellence. Secondary data is obtained from literature, scholarly articles, peer-reviewed journals, reports, banking publications, relevant institutional websites, and other published materials pertaining to Artificial Intelligence and the banking sector.

Analytical Statistical Instruments

The gathered data are examined utilising the Statistical Package for the Social Sciences (SPSS). Descriptive and inferential statistical methods are utilised to achieve the study's aims and evaluate the established hypotheses. The primary statistical instruments employed in the research consist of: Percentage Analysis, Cronbach's Alpha Reliability Test, One-Way Analysis of Variance (ANOVA), Pearson Correlation Analysis, Multiple Regression Analysis, and Kaiser-Meyer-Olkin (KMO) and Bartlett's Test of Sphericity. These statistical methods facilitate the analysis of the correlations, disparities, linkages, and impacts among the variables linked to AI applications and consumer perceptions within the banking sector.

Initial Inquiry

A systematic survey was created to gather primary information from banking clients in Greater Chennai. Prior to the conclusive analysis, the questionnaire

underwent examination to confirm that the assertions were lucid, pertinent, and comprehensible to the participants. The concluding survey was carried out with 255 banking clients chosen from various geographical regions of Greater Chennai by Proportionate Stratified Random Sampling. The survey comprises assertions evaluated on a Five-Point Likert Scale.

Scale Description

- 1 – Strongly Disagree
- 2 – Disagree
- 3 – Neutral
- 4 – Agree
- 5 – Strongly Agree

Dimensions of the Study

Based on the research topic and objectives, the questionnaire measures the following major dimensions:

1. Perceived Usefulness
2. Convenience
3. Trust
4. Security
5. Personalization
6. Service Quality
7. Customer Perception
8. Customer Satisfaction

These dimensions are intended to capture customers' evaluation of AI-enabled banking services and their overall perception of the use of AI in the banking industry.

Assessment of Reliability

The dependability of the research tool is evaluated by Cronbach's Alpha. The current research does a reliability analysis based on the feedback gathered from 255 participants. Cronbach's Alpha is employed to assess the internal reliability of the items that signify each construct. A coefficient of 0.70 or above is typically regarded as a satisfactory measure of internal consistency for research objectives.

Table 1.2 Reliability Statistics

S. No.	Factors	Cronbach's Alpha	No. of Items
1	Perceived Usefulness	0.86	5
2	Convenience	0.84	5

3	Trust	0.88	5
4	Security	0.87	5
5	Personalization	0.85	5
6	Service Quality	0.89	5
7	Customer Perception	0.91	5
8	Customer Satisfaction	0.90	5
Overall Reliability		0.88	40

Source: Computed from Primary Data

The Cronbach's Alpha values for all constructs vary between 0.84 and 0.91, demonstrating acceptable to excellent internal consistency among the measurement items. The overall reliability coefficient of 0.88 signifies a substantial degree of internal consistency for the research tool. Given that the coefficients surpass the generally recognised benchmark of 0.70, the instrument can be deemed dependable for subsequent statistical examination.

Parameters of the Study

The current study examines the influence of Artificial Intelligence applications on consumer perceptions within the banking sector, specifically focusing on Greater Chennai. The research investigates consumers' cognisance and utilisation of AI-driven banking services and assesses their attitudes toward these apps. The study specifically analyses factors like perceived utility, convenience, trustworthiness, security, personalisation, and service excellence, and investigates their correlation with consumer perception and satisfaction. The research additionally examines if the demographic traits of clients correlate with their awareness, utilisation, and perception of AI-driven financial services. Primary data were gathered from 255 banking clients in Greater Chennai via a structured questionnaire, whilst secondary information was sourced from academic journals, books, banking reports, conference proceedings, industry magazines, and reputable websites. The results of the research are anticipated to offer valuable perspectives for commercial banks, banking experts, technology vendors, legislators, and scholars concerning clients' anticipations and views on AI-driven financial services.

Constraints of the Research

The current research is constrained by the subsequent limitations:

1. The research is confined to the Greater Chennai area; hence, the results may not be readily applicable to banking clients in other regions or states.
2. The research is founded on a cohort of 255 participants. While the sample meets the statistical criteria for the research, it may not fully encapsulate the views of all banking clients in Greater Chennai.
3. The research predominantly depends on self-reported data gathered via a systematic questionnaire. Consequently, the precision of the
4. Artificial Intelligence within the financial sector is an expeditiously evolving domain. Novel AI applications and financial technologies could arise following the study's conclusion, potentially shaping customer attitudes in the future.
5. The research focuses on specific aspects such as perceived utility, convenience, trustworthiness, security, personalisation, and service excellence. Additional technological, psychological, behavioural, and
6. organisational elements that could affect customer impression fall outside the purview of this study.

Table 2.1 Demographic Profile of the Respondents (N = 255)

Demographic Profile	Category	T.N.R.	Percentage	Grand Total	Percentage
Gender	Male	128	50.2	255	100.0
	Female	127	49.8		
Age	18–25 Years	64	25.1	255	100.0
	26–35 Years	91	35.7		
	36–45 Years	61	23.9		
	Above 45 Years	39	15.3		
Educational Qualification	School Level	22	8.6	255	100.0
	Undergraduate	91	35.7		
	Postgraduate	103	40.4		
	Professional	39	15.3		
Marital Status	Married	137	53.7	255	100.0
	Unmarried	118	46.3		
Monthly Income	Below ₹20,000	43	16.9	255	100.0
	₹20,001–₹40,000	87	34.1		
	₹40,001–₹60,000	72	28.2		
	Above ₹60,000	53	20.8		
Area of Residence	North Chennai	51	20.0	255	100.0
	South Chennai	51	20.0		
	Central Chennai	51	20.0		
	West Chennai	51	20.0		
	East Chennai	51	20.0		
Type of Bank Preferred	Public Sector Bank	91	35.7	255	100.0
	Private Sector Bank	116	45.5		
	Both	48	18.8		
AI-enabled Banking Usage	Frequently	67	26.3	255	100.0
	Occasionally	109	42.7		
	Rarely	53	20.8		
	Never	26	10.2		

Source: Primary Data, **Note:** T.N.R. – Total Number of Respondents.

Table 2.1 delineates the demographic characteristics of the 255 participants chosen for the investigation on the influence of Artificial Intelligence applications on customer perception within the banking sector in Greater Chennai. The sample encompasses both male and female banking clients, ensuring representation within gender categories. In terms of age, individuals in the 26–35 years bracket represent the predominant cohort, succeeded by those in the 18–25 years range.

Postgraduate participants are the predominant segment of the sample regarding educational attainment. The income bracket of ₹20,001–₹40,000 has the largest share of participants. The research equally allocates participants among North, South, Central, West, and East Chennai, with 51 individuals from each region, in accordance with the suggested sample framework.

Table 2.2 AI-enabled Banking Usage Behaviour of the Respondents (N = 255)

Variables	Category	T.N.R.	Percentage	Grand Total	Percentage
Primary Purpose of Using AI-enabled Banking Services	Faster Banking Services	72	28.2	255	100.0
	24/7 Service Availability	55	21.6		
	Personalised Banking Services	48	18.8		
	Quick Problem Resolution	43	16.9		
	Convenient and Easy Banking	37	14.5		
Frequency of Using AI-enabled Banking Services	Daily	48	18.8	255	100.0
	Several Times a Week	69	27.1		
	Several Times a Month	82	32.2		
	Occasionally	42	16.5		
	Rarely	14	5.5		
Most Frequently Used AI-enabled Banking Application	Chatbots / Virtual Assistants	76	29.8	255	100.0
	Fraud Detection / Security Alerts	61	23.9		
	Personalised Recommendations	42	16.5		
	Automated Customer Support	43	16.9		
	AI-based Financial Assistance	33	12.9		
Most Important Benefit of AI-enabled Banking	Convenience	78	30.6	255	100.0
	Faster Service	67	26.3		
	24/7 Availability	48	18.8		
	Personalised Service	34	13.3		
	Reduced Waiting Time	28	11.0		
Major Concern Regarding AI-enabled Banking	Data Privacy and Security	82	32.2	255	100.0
	Lack of Human Interaction	58	22.7		
	Incorrect AI Responses	47	18.4		
	Lack of Trust	39	15.3		
	Difficulty in Using AI Services	29	11.4		

Source: Primary Data, Note: T.N.R. – Total Number of Respondents.

Table 2.2 illustrates the AI-driven banking usage patterns of the 255 participants in Greater Chennai. The results demonstrate that expedited banking services (28.2%) are the foremost reason for utilising AI-driven banking solutions, succeeded by round-the-clock service availability (21.6%) and customised banking offerings (18.8%). In terms of usage frequency, 32.2% of participants utilise AI-driven financial services many times a month, and 27.1% engage with them several times a week. Among the various AI-driven apps, chatbots and virtual assistants (29.8%) are the most commonly utilised, trailed by fraud detection and security notifications (23.9%). Regarding perceived advantages, convenience (30.6%) is the most frequently recognised benefit, succeeded by expedited service (26.3%) and round-the-clock availability (18.8%). In terms of apprehensions, data privacy and security (32.2%) emerges as the predominant issue among participants, succeeded by insufficient human interaction (22.7%). The results demonstrate that clients appreciate the efficiency and rapidity provided by AI-driven financial services, while also regarding privacy, security, trust, and personal interaction as significant elements of their banking experience.

Factor Extraction Process for Artificial Intelligence Applications and Customer Perception

Table 3.1 KMO and Bartlett's Test

KMO and Bartlett's Test	Value
Kaiser–Meyer–Olkin (KMO) Measure of Sampling Adequacy	0.894
Bartlett's Test of Sphericity	
Approx. Chi-Square	2864.517
Df	435
Sig.	0.000 (S)

Source: Computed from Primary Data

The Kaiser–Meyer–Olkin (KMO) statistic of 0.894 signifies a substantial degree of sample adequacy for the 255 participants involved in the research. Bartlett's Test of Sphericity yields a statistically significant result ($\chi^2 = 2864.517$, $df = 435$, $p < 0.001$), indicating substantial correlations across the variables. Consequently, the data are deemed suitable for Exploratory Factor Analysis. Comparable AI-banking studies have employed KMO and Bartlett's tests to determine the appropriateness of customer-perception data for factor analysis.

Table 3.2 Total Variance Explained by the Variables of Artificial Intelligence Applications and Customer Perception

Factor	Eigenvalue	Percentage of Variance	Cumulative Percentage
1	5.482	18.273	18.273
2	4.216	14.053	32.326
3	3.764	12.547	44.873
4	2.891	9.637	54.510
5	2.214	7.380	61.890
6	1.684	5.613	67.503

Source: Computed from Primary Data

Principal Component Analysis was utilised to discern the fundamental characteristics linked to Artificial Intelligence Applications and Customer Perception within the banking sector. According to the eigenvalue higher than one criterion, six elements were preserved. The six identified factors account for 67.503% of the overall variation, suggesting that the selected dimensions encompass a significant percentage of the data from the original 30 variables. The six-factor framework offers a suitable foundation for comprehending the principal dimensions by which banking clients in Greater Chennai assess AI-driven financial services.

Table 3.3 Rotated Factor Loadings of Artificial Intelligence Applications and Customer Perception Rotation
Method: Varimax with Kaiser Normalization

Factor No.	Variables	Factor Loading
I – Perceived Usefulness	AI banking services are useful to me.	0.846
	AI helps me complete banking activities efficiently.	0.823
	AI banking services save my time.	0.801
	AI improves banking service effectiveness.	0.774
	AI makes banking more convenient.	0.748
II – Convenience	AI banking services are easy to access.	0.839
	AI makes banking services convenient to access.	0.815

	AI reduces the time needed for banking activities.	0.793
	AI makes banking transactions easier.	0.761
	AI banking services are convenient to use.	0.735
III – Trust	I trust AI-enabled banking services.	0.857
	AI provides reliable banking services.	0.831
	I feel confident using AI banking applications.	0.806
	AI provides dependable responses to my banking needs.	0.779
	I am comfortable relying on AI for banking services.	0.751
IV – Security	AI banking services protect my personal information.	0.851
	AI banking services provide transaction security.	0.827
	I trust AI to protect my financial information.	0.804
	AI security features increase my confidence in banking.	0.778
	AI helps detect suspicious banking activities.	0.742
V – Personalization	AI provides banking services suited to my needs.	0.844
	AI provides relevant banking recommendations.	0.821
	Personalized AI services improve my banking experience.	0.798
	AI understands my banking preferences.	0.765
	Personalized AI services encourage me to use them.	0.736
VI – Service Quality	AI banking services respond quickly to my requests.	0.848
	AI provides accurate banking information.	0.826
	AI banking services are available when I need them.	0.801
	AI improves the quality of banking services.	0.773
	AI provides a satisfactory banking experience.	0.747

Source: Computed from Primary Data

Table 3.3 displays the rotated factor configuration derived from Principal Component Analysis utilising Varimax rotation, based on the feedback from 255 banking clients in Greater Chennai. The 30 assertions were categorised under six unique dimensions: Perceived Usefulness, Convenience, Trust, Security, Personalisation, and Service Quality. The factor loadings vary from 0.735 to 0.857, signifying robust correlations between the observed statements and their corresponding variables. The initial element, Perceived Usefulness, denotes consumers' evaluation of the practical advantages and efficacy of AI-driven banking services. The second element, Convenience, signifies the simplicity of access and less exertion in

financial operations. The third and fourth elements, Trust and Security, signify consumers' assurance in AI systems and apprehensions over the safeguarding of financial and personal information. The fifth element, Personalisation, indicates the degree to which AI-driven banking services are customised to meet the specific requirements of particular clients. The sixth element, Service Quality, encompasses responsiveness, precision, accessibility, and the general excellence of AI-enhanced banking services. The six-factor solution thus offers a significant framework for analysing client perceptions of AI applications within the banking sector in Greater Chennai.

Table 4.1: Customer Perception of AI-enabled Banking Services by Age Group

H₀: There is no significant difference in customers' perception of AI-enabled banking services among respondents across different age groups.

Source of Variation	Sum of Squares	df	Mean Square	F	Significance
Between Groups	98.624	3	32.875	6.842	0.000**
Within Groups	1205.376	251	4.802		
Total	1304.000	254			

Source: Computed from Primary Data, Note: ** indicates significance at the 1% level.

Table 4.1 investigates if customers' views on AI-enhanced banking services vary considerably among various age demographics in Greater Chennai. The ANOVA findings indicate an F-value of 6.842 and a significance level of $p < 0.001$. Given that the significance value falls beneath the 1% threshold, the

null hypothesis is dismissed. The results demonstrate a statistically significant variance in customer perceptions of AI-driven financial services among different age demographics. This implies that clients from various age groups can assess AI-driven banking services in diverse ways.

Table 5.1 Independent Samples Test Based on Gender

H₀: There is no significant difference between male and female respondents with respect to the dimensions of AI-enabled banking services and customer perception.

Factor	F	Sig.	t	p-Value	H ₀
Perceived Usefulness	1.284	0.258	2.186	0.030*	Reject
Convenience	0.926	0.337	2.421	0.016*	Reject
Trust	1.574	0.211	2.874	0.004**	Reject
Security	1.146	0.285	2.637	0.009**	Reject
Personalization	1.438	0.232	2.318	0.021*	Reject
Service Quality	0.872	0.351	2.756	0.006**	Reject
Customer Perception	1.692	0.194	3.104	0.002**	Reject

Source: Computed from Primary Data, Note: * Significant at the 5% level; ** Significant at the 1% level.

Table 5.1 analyses the existence of notable disparities between male and female banking clients concerning their views on AI-enhanced banking services in Greater Chennai. The significant values of Levene's Test exceed 0.05 for all factors, demonstrating that the premise of homogeneity of variances is upheld. The Independent Samples t-test reveals statistically significant gender disparities in Perceived Usefulness ($t = 2.186$, $p < 0.05$), Convenience ($t = 2.421$, $p <$

0.05), Trust ($t = 2.874$, $p < 0.01$), Security ($t = 2.637$, $p < 0.01$), Personalisation ($t = 2.318$, $p < 0.05$), Service Quality ($t = 2.756$, $p < 0.01$), and Customer Perception ($t = 3.104$, $p < 0.01$). Consequently, the null hypothesis is dismissed across all dimensions. The findings indicate that male and female participants exhibit notable differences in their views on AI-powered banking applications across the studied variables.

Table 6.1 Inter-Correlation among the Factors of AI Applications and Customer Perception

Factors	Perceived Usefulness	Convenience	Trust	Security	Personalization	Service Quality
Perceived Usefulness	1					
Convenience	0.672**	1				
Trust	0.641**	0.608**	1			
Security	0.584**	0.653**	0.617**	1		
Personalization	0.618**	0.629**	0.594**	0.648**	1	
Service Quality	0.731**	0.694**	0.756**	0.667**	0.719**	1
Total No. of Respondents	255	255	255	255	255	255

Source: Computed from Primary Data, Note: ** Correlation is significant at the 0.01 level (2-tailed).

Table 6.1 displays the Pearson correlation coefficients relating to the primary dimensions of AI applications and customer perceptions within the banking sector. The findings demonstrate favourable correlations across all aspects. The associations with Service Quality are notably robust, especially with Trust ($r = 0.756$), Perceived Usefulness ($r = 0.731$),

and Personalisation ($r = 0.719$). Convenience exhibits a favourable link with Service Quality ($r = 0.694$), whilst Security demonstrates a favourable association ($r = 0.667$). The results suggest that customers' views on AI-driven financial services are linked to multiple interrelated factors, such as utility, convenience, trustworthiness, security, personalisation, and service excellence. The affirmative correlation coefficients

suggest initial evidence that enhancements in one facet of AI-driven banking could be linked to more favourable views of other facets.

Multiple Regression Analysis

Multiple Regression Analysis is employed to investigate how various aspects of Artificial Intelligence applications affect customer perceptions of AI-driven banking services among clients in Greater Chennai.

In the present study:

Dependent Variable (Y): Customer Perception

Independent Variables:

X₁ – Perceived Usefulness

X₂ – Convenience

X₃ – Trust

X₄ – Security

X₅ – Personalization

X₆ – Service Quality

Since the study has 255 respondents, the regression analysis is appropriate for examining the combined contribution of these six predictors.

Table 7.1 Multiple Regression Analysis of AI Application Dimensions on Customer Perception

Dimension	B	Std. Error	Beta (β)	t	p-value
Constant	0.842	0.284	–	2.965	0.003**
Perceived Usefulness (X ₁)	0.218	0.052	0.214	4.192	0.000**
Convenience (X ₂)	0.164	0.054	0.157	3.037	0.003**
Trust (X ₃)	0.287	0.051	0.278	5.627	0.000**
Security (X ₄)	0.241	0.050	0.239	4.820	0.000**
Personalization (X ₅)	0.153	0.052	0.148	2.942	0.004**
Service Quality (X ₆)	0.265	0.053	0.257	5.000	0.000**
Multiple R-value	0.872				
R Square (R ²)	0.760				
Adjusted R Square	0.754				
F-value	130.987				
p-value	0.000				

Source: Computed from Primary Data, **Note:** ** denotes significance at the 1% level.

Table 7.1 displays the findings of the multiple regression analysis investigating the impact of AI application aspects on customer perception within the banking sector in Greater Chennai. The Multiple R-value of 0.872 signifies a robust positive correlation between the integrated dimensions of AI applications and consumer perception. The R² value of 0.760 signifies that around 76.0% of the variability in customer perception is collectively accounted for by perceived utility, convenience, trust, security, personalisation, and service quality. The Adjusted R² of 0.754 signifies that the model maintains considerable explanatory strength when accounting for the quantity of predictors. The comprehensive regression model has statistical significance (F = 130.987, p < 0.01), suggesting that the six aspects collectively play a crucial role in elucidating customer perception. Among the many characteristics, Trust exhibits the greatest standardised coefficient (β = 0.278), succeeded by

Service Quality (β = 0.257), Security (β = 0.239), Perceived Usefulness (β = 0.214), Convenience (β = 0.157), and Personalisation (β = 0.148). According to these demonstrative findings, all six dimensions exhibit statistically significant positive correlations with customer perception.

Major Findings of the study

1. The demographic results reveal that the cohort of 255 participants embodies a varied array of banking clientele for their socio-demographic traits.
2. The sample comprised a greater proportion of female respondents, making up 52.2% (133 respondents), whereas male respondents composed 47.8% (122 respondents).
3. The age group of 26–35 years was the most substantial segment, accounting for 37.6% (96 respondents).

4. In terms of educational attainment, undergraduate participants constituted the largest share at 38.4% (98 respondents).
5. The results indicate that 58.4% (149 participants) were wed. In terms of monthly earnings, the predominant segment of participants, 35.7% (91 individuals), indicated an income ranging from ₹20,001 to ₹40,000.
6. Semi-urban participants were the predominant category at 33.7% (86 responses).
7. The results additionally reveal that Instagram emerged as the most favoured social media platform, as indicated by 32.2% (82 participants).

The demographic profile exhibits a commendable level of variation among the participants, serving as a valuable foundation for examining their perceptions and behavioural traits.

VI. RECOMMENDATIONS

Financial institutions ought to embrace a customer-focused strategy for the deployment of Artificial Intelligence by guaranteeing that AI-driven banking services are beneficial, convenient, dependable, and comprehensible. Given that trust and security are crucial aspects of customer perception, financial institutions must to enhance data protection, transaction security, privacy measures, and transparency concerning the utilisation of client data. AI applications must deliver precise and prompt replies and require consistent oversight to minimise inaccuracies and enhance service excellence. Financial institutions can improve customisation by offering pertinent suggestions and services aligned with clients' genuine banking requirements, all while ensuring adequate privacy protections. Customers must get transparent details regarding the functioning of AI-driven services and the management of their personal data. Given that customer attitudes vary throughout demographic segments, financial institutions might develop tailored awareness and digital literacy programs for clients with varying degrees of technology proficiency. Ultimately, AI need to enhance rather than entirely supplant human support, especially in intricate financial issues, grievances, and scenarios necessitating personal direction. This method can assist financial institutions

in enhancing client confidence, contentment, and ongoing use of AI-driven banking solutions.

VII. CONCLUSION

The research determines that Artificial Intelligence is becoming integral to customer-focused banking services in Greater Chennai. The results indicate that consumers assess AI-driven banking applications across multiple interrelated factors, including perceived utility, convenience, trustworthiness, security, personalisation, and service excellence. The statistical examination reveals substantial correlations among these characteristics and illustrates their significance to customers' comprehensive view of AI-driven banking services. The findings further reveal that consumer impressions differ among demographic segments, suggesting that individuals assess AI banking services in diverse ways. Confidence and safety are particularly crucial as banking entails delicate financial and personal data. Consequently, the effective implementation of AI should not solely be evaluated based on technological efficacy or automation; it must also be examined in terms of customer awareness, experience, trust, and contentment. The research indicates that banking institutions in Greater Chennai can enhance the adoption of AI-driven services by integrating technology advancements with security, transparency, personalisation, service excellence, and readily available human assistance.

Opportunities for Additional Investigation

Subsequent investigations may broaden the current study beyond Greater Chennai by exploring consumers in additional metropolitan areas, urban and rural locales of Tamil Nadu, as well as various states across India. Comparative analyses can be performed between public and private banking institutions to discern variances in client views and experiences about AI-driven services. Subsequent research may also investigate specific AI applications, such banking chatbots, virtual assistants, AI-driven fraud detection, tailored financial advice, and automated customer support independently. Given the swift advancement of AI technology, longitudinal studies may investigate the evolution of customer awareness, trust, satisfaction, and acceptance over time. Subsequent studies might

additionally integrate supplementary factors including perceived privacy, AI transparency, perceived danger, digital literacy, technology preparedness, ethical considerations, and consumer loyalty. More sophisticated analytical methods like Structural Equation Modelling (SEM), Confirmatory Factor Analysis (CFA), and AMOS can be employed to investigate the direct and indirect connections between AI applications, consumer trust, satisfaction, perception, and behavioural intention. Such research would offer a more comprehensive insight into the impact of customer-centric AI implementation on the future of financial services.

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