Impact of Artificial Intelligence towards customer relationship in Indian banking industry

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ABSTRACT

The most significant & ground-breaking innovations in the banking industry is the growing emphasis on the needs of the consumer. Consumers that are technically knowledgeable and regularly interact with cutting-edge innovations want banks to provide smooth experiences. For operations like digital money, e-banking, and real cash transfers, financial institutions have extended their industrial landscape to include retail, IT, and telecom in order to meet these requirements. While these developments have made it possible for consumers to reach the majority of banking services at anytime, anywhere, they have also come at a cost to the financial sector. This study also sheds light on the advantages and disadvantages of adopting AI technology in the Indian banking sector. This study is of descriptive nature which describes the usage of artificial intelligence in banking services and the effect on relationship with customer. Data was collected from total 187 customers of Delhi of public and private sector banks using Questionnaire.

Introduction

Due to intense competitiveness in the banking industry carried on by the globalization of the economy, the financial sector is unbalanced and fragile [1]. The banking sector involves many steps, from screening application forms to establishing safe monetary operations for clients up till they continue to use the institutions' services [3]. Wherever they interact with businesses and services, consumers are seeking better service; in certain words, they are pressing for an enhanced customer experience. Since technology has advanced over the last several decades, businesses have started implementing cutting-edge innovation, including artificial intelligence, to provide clients with higher-quality services. [4] Looks at the applications of AI in India's leading financial institutions as well as the sectors in which artificial technology is being used in banks. Banking is becoming more modern, and banks are utilizing cutting-edge technology like blockchain, cloud computing, and AI more frequently.

Artificial intelligence in financial institutions refers to technology that determines conclusions and actions that traditionally allowed human to human engagement. On the Forbes website, [2] the developer of Fuse Technologies, posted an article about how AI is assisting banking firms. According to the report, artificial intelligence is assisting financial organizations in expanding, and it is predicted that by 2030, AI will have captured the financial sector more than $trillion dollars. The report also noted that the commercial banks has begun utilizing artificial intelligence to solve a number of long-standing financial issues. For instance, Bank of America has already created a virtual assistant named Erica, an Automation tool that gives the bank's customers investment advice via speech and text messaging. Clients have access to this facility around-the-clock, and it can handle routine transactions. Financial institutions should use this technology to stay up to date with the most recent advances in the IT business [5].

Financial institutions should employ cognitive technology, according to the researchers of [6] to aid decision-making by managers. Communicative AI systems are well-known in the banking industry on media platforms and mobile applications for facilitating quick engagement with consumers, according to past research results [7]. The usage of AI technologies in banking customer relations has been discovered to have clear uses and advantages, but scientific study shows that these systems still have problems with securities and trustworthiness because the technology is still susceptible to breaches [8]. The latest research, however, differ from earlier study efforts in that they emphasize AI-powered automation as a significant tool for giving bank customers quick access to reliable information and enhancing their customer service [9].The simplicity of use characteristic of automation has substantial predictive value in establishing trust for providers, and this is likely to have a reasonable impact on consumers' trust in AI technologies for customer relations, according to [10].

Literature Review

Evolution of Artificial Intelligence in Banking Industry

In recent decades, the Indian banking industry has been idealistically integrating AI-enabled technologies into its operational processes. The first research on the possibilities for automated processes was written by Alan Turing in the 1950s, which is when AI was first popular. Although the term "artificial intelligence" was just recently created, applications didn't start to appear until the late 1990s [11]. Although major internet businesses like Twitter, IBM, Apple, and Amazon started utilizing AI and analysis tools for business purposes in 2011, the development of AI technologies only accelerated.AI implementations include a wide range of techniques, including algorithm monitoring, facial detection, and optical character recognition. Advertising and targeting, accountancy, insurance, the internet, transportation, aerospace, agriculture, and genetics are just a few of the commercial sectors where AI is now being used [12].

To improve customer service, the Indian banking industry has made significant investments in chatbots and artificial intelligence (AI). According to PwC Fin-Tech Trends Report 2017, investment on AI and its allied technologies would be touched 5.5 billion USD, and it up from 4.1billion USD in the year 2015. While many retail and commercial banks throughout the world have adopted artificial intelligence and associated technologies to manage customer and back- office-related

operations, India's adoption of these technology lags behind that of more developed nations (BFSI, 2019). Many banks and financial institutions have recently partnered with Fin-Tech firms to develop proof of concepts (POCs), which have since been implemented throughout daily operations. As a result, AI is viewed as a successful and viable business in India's Fin-Tech industry [13].It is highlighted that while over 70% of sectors stated their intention to spend in the future, only roughly 36% of major financial institutions have already made significant investments in this type of technology [14]. Real-time fraud detection, AI-driven customer service, and strategic planning are the three areas that may pique the curiosity of individuals looking to disrupt a sector [15].

Customer Support System

An official support platform allows a user to automatically access a variety of information kinds that are kept in a database [16]. In their research,[17] emphasized how companies employ different technologies to interact with their clients. They strive to have customers associate with them instantly. Validation and identification are provided by the system. Prior to answering a client queries, it is crucial to confirm their authenticity. The customer support system needs customer identification because fraudulent customers could otherwise prohibit legitimate users from utilizing it. The safety of the system can be questioned as a result [18].According to [19], mainly to rapidly acquired user input, internet banking enables banks to establish and preserve safe relationships with their clients while lowering operating and fixed costs. Users can learn from their errors and overcome some of the difficulties posed by traditional channels, such as problems with accessibility, bottlenecks, participation, and identity, by using web-based computer systems.

Additionally, it benefits banks by lowering transaction costs, speeding up transactions, reducing procedural errors, and providing receiving a response [20]. The ease and convenience with which customers can use the services that bankers provide them is referred to as the consumer support system. Interactiveness and contractibility are the two essential aspects of mobility. Consumer satisfaction is greater when services are

more easily accessible, per research [21]. Client relationship management is an essential tool that banks can employ to serve their clients [22]. The banks can use the recent increase in customer interest in AI assisted banking apps [23] to recruit additional customers. According to [24], if a business wants to keep clients, it must offer them better services through improvements in quality and should continually enhance the advantages that customers seek.
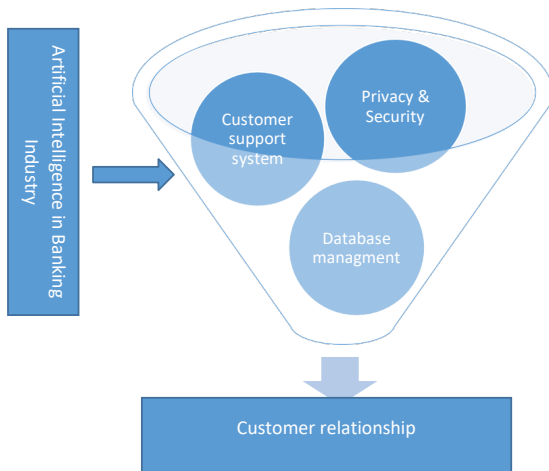
Privacy & Security

By identifying fraud, determining a one's credibility, and providing individualized services, AI is also assisting the banking sector [25]. However, one of the main issues facing banks is the threat and vulnerability of cyberspace. [26] Only 10% of firms use AI to compete in the market since there are several difficulties in implementing it. The innovation is still in its infancy despite growing acceptance of AI in the financial sector. [27]This is due to the fact that the banking industry faces a number of concerns, including those related to infrastructure, rising technical complexity, employee attrition, and others. Despite the risks, the financial industry has embraced cutting-edge methods like automation and deep learning to increase consumer happiness [28]. According to [29], privacy and security concerns are essential for the uptake of online banking. Concerns about the use of internet banking related to perceived danger, such as identity theft [30]. Trust is a key factor in determining whether e-banking will be accepted.

Database Management system

Data management is now of the greatest priority due to the pressures of regulation, regulatory compliance, management quality, effective customer connections, and advertising. The accuracy of the data affects how well decisions are made [31]. To acquire, transfer, and store information, all banks and financial organizations move away from the traditional on-premises information storage, analysis, archiving, and removal methods. Furthermore, it helps to reduce costs, provide predictive data solutions, and improve customer convenience for banking customers [32]. A database management

system is the term used by [33] to describe the system software used to construct and maintain databases. With the aid of a DBMS, authorized users can create, protect, access, modify, and delete a database's information [34].

A lot of new programmed are seen to be crucial for an effective data security strategy that makes banking clients' lives easier. In the banking sector today, data management is said to be becoming increasingly important [35]. To prevent incorrect results and discrepancies and to maintain strong customer service, bankers should maintain adequate data management of records and transactions [35]. The speed at which innovations and technological advancements are occurring in the banking sector has made privacy a crucial concern today. This further entails how customers' sensitive information and transactions are handled both offline and online [36].

Source: Author

Objectives of the study

1. To identify the impact of artificial intelligence on customer support in Indian banking sector.
2. To study the impact of artificial intelligence on privacy &security in Indian banking industry.
3. To study the impact of artificial intelligence on Database management system in Indian banking industry

Hypotheses for study:

H01: There is no positive relationship between artificial intelligence and customer support system. **H01: There** is positive relationship between artificial intelligence and customer support system. **H02:** There is no positive relationship between artificial intelligence and privacy & Security.

H12: There is positive relationship between artificial intelligence and privacy & Security

H03: There is no positive relationship between artificial intelligence and Database management system.

H13: There is positive relationship between artificial intelligence and Database management system.

Research methodology

This study is the combination of quantitative and qualitative methods was used in this work. For primary data to acquire primary data, a survey is being done using a questionnaire. For obtaining the secondary data different data accessible via websites, journals, books etc. has been employed in this research. The Target Population and Sampling for this research is based on Delhi, the respondents are from Public and Private sector banks in Delhi/NCR, with reference of its customers. The questionnaire distributed to 250 samples out of which 187 responded .The Sampling Technique of sampling used in this research Convenience sampling techniques

"Descriptive statistics is used to describe the sample, to show the numbers and percentage of the items falling in categories [37]. Analysis of variance determines the statistically significant difference in means occurring between two or more groups. Correlation analysis is to measure the degree of relationship between to variables". The Tools used for data analysis and interpretation in this research are SPSS and MS Excel have been used for both data coding as well as data transcription.

Collection of data from respondents - The topic for the research study is the Impact of Artificial Intelligence towards customer relationship in Indian banking industry and the nature of study is descriptive and exploratory. The sources of data collection are both primary and

secondary based. Primary data has been collected by conducting survey method. The other form of source for data collection has been secondary based. The data and the information have been extracted from authenticated websites, books, journals, articles, business magazine and brochure. Through the secondary data, researcher has analyzed the different applications of artificial intelligence in the banking sector and how AI is helping banks to improve their results. The scope of study is to analyze the different applications of AI in banks and in what ways AI could help Indian banks to improve their performance.

Questionnaire Design - A list of questions in the format of statements, termed as a questionnaire, must be prepared in order to quantify the survey respondents' responses. 21 questions were initially created with the idea of the constructions in mind, with the goal of ensuring that there wouldn't be any contentious,

perplexing, or misleading questions. It was made sure that the responders could grasp the question accordingly. It was taken into consideration that the questions should be designed to measure respondents' opinions toward the idea and notion of adopting AI-integrated systems in the banking industry [38].

To increase the response rate, all of these thorough measures were done [39]. Each participant was instructed to check one choice on the worksheet for each question, which had five options ranging from strongly disagree to strongly agree on a five-point Likert scale. The response sheet came with a clear instruction sheet that explained how to fill it out. Additionally, the purpose of this study and the fact that it is entirely academic were made perfectly clear on the response page. Additionally, it was guaranteed that the respondents' confidentiality and privacy would be carefully upheld [40].

Q ID	QUESTIONAIRE	Cronbach's Alpha	PEARSON CORRELATIO N COEFICENT	P value significan t at p < .05.
CSS	**CUSTOMER SUPPORT SYSTEM**			
CSS1	Chatbots support system is reliable	0.833	.493**	< .00001.
CSS2	Banking customer support system is flexible according to needs of customers.	0.825	.595**	< .00001.
CSS3	Customer Support system is always updated.	0.826	.589**	< .00001.
CSS4	Virtual Assistant support system always has solution towards customers.	0.826	.584**	< .00001.
CSS5	Banking AI Customer Support system is as per customer needs.	0.837	.598**	< .00001
CSS6	Banking Support system focuses on customer value.	0.827	.493**	< .00001
PS	**PRIVACY & SECURITY**			
PS1	Banking security & privacy policies are trustable	0.823	.614**	< .00001.
PS2	Banking AI security management is fully flexible.	0.826	.585**	< .00001.
PS3	Banking Security & privacy management is updated	0.825	.606**	< .00001.
PS4	Banking 24*7 Security policies take customer value in consideration.	0.831	.724**	< .00001
PS5	Banking AI system feels secured & values customer needs.	0.825	.576**	< .00001.
PS6	Banking security system always(24*7) available towards customer	0.836	.416**	< .00001.
DMS	**DATABASE MANAGEMENT SYSTEM**			
DMS1	Banking System provides information timely	0.828	.674**	< .00001
DMS2	Banking system keeps customer data as per customer needs	0.825	.566**	< .00001.
DMS3	Banking customer database updated timely & accurately	0.826	.588**	< .00001.
DMS4	Banking Database system is trustable as per customer value	0.828	.533**	< .00001.
DMS5	Banking database system always look for customer needs.	0.835	.442**	< .00001.
DMS6	Banking database system never shares your data with someone else	0.832	.473**	< .00001.

Data analysis and Interpretation

Pilot study - A pilot study was conducted with 50 samples to prevent any inaccuracies and to verify the questionnaire method, tools of data collection and data analysis & measuring instrument. Continuing after the pilot samples collection, the respondent measurement criteria were verified using suitable methodologies and related hypotheses. On the conclusion of the pilot survey with reliability and validity assessment, appropriate changes were made by the researcher and sampling methods.

As per Table 1. From the total 187 respondents, majority 49.2 % in conducted study were female and the remaining 50.8% were male. The consumers are in the age group 59.35% of them were in age group of 18-30, 19.78 % of them were in 30-40 age group, 12.83% were in 40-50 age group and 8.04 % were greater than age 50. The occupation of respondents in the study conducted 19.3% were students, 5.9 % were home-maker, 47.6 % were

salaried, 19.3% were self-employed and 8 % were described themselves in other economic activity.

Reliability and validity - As in any type of survey research, nonresponse bias was a potential problem in this study. Two methods have been suggested to test for nonresponse bias in online- mail surveys [41]. The first approach involves interviewing a sample of non-respondents to determine the presence and/or effect of a nonresponse bias. This approach was not taken due to difficulties in maintaining confidentiality. The second approach is based on the "interest hypothesis," which assumes that the non-respondents are like the late respondents. Using this method, early respondents were compared with late respondents.

Testing for reliability is important as it refers to the consistency across the parts of a measuring instrument [42]. A scale is said to have high internal consistency reliability if the items of a scale "hang together" and measure the same construct [42, 43]. The most

Table 1: Descriptive statistic

	Descriptive Statistics						
	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error
AGE	187.000	1.000	4.000	1.492	0.750	1.532	0.178
Gender	187.000	1.000	2.000	1.492	0.501	0.032	0.178
OCC	187.000	1.000	5.000	2.492	1.229	0.678	0.178
AGE	18-30	111		59.35%			
	30-40	37		19.78%			
	40-50	24		12.83%			
	GREATER THAN 50	15		8.04%			
Gender	MALE	95		50.8%			
	FEMALE	92		49.2%			
Occupation	STUDENT	36		19.3%			
	SALARIED	89		47.6%			
	HOME-MAKER	11		5.9%			
	SELF-EMPLOYED	36		19.3%			
	OTHER	15		8.0%			
Valid		187		100.0%			

commonly used internal consistency measure is the Cronbach Alpha coefficient. It is viewed as the most appropriate measure of reliability when making use of Likert scales [43, 44]. No absolute rules exist for internal consistencies, however most agree on a minimum internal consistency coefficient of .70 [43, 44].

When KMO is close to 1.0, the correlation between variables is strong and the variables are suitable for factor analysis [45]. In this study the Cronbach's Alpha is 0.877 > 0.7 which is consistent for research and Also the KMO score is significant at the scale. In Table 2 the Study shows he KMO and Bartlett test at the score of 0.866 > 0.6 which is significant at P values. The analysis of data shows the validate result of reliability and validity of data at significant p values.

These results in table suggest that the respondents in this study clearly discriminated and providing evidence of discriminant validity. The above table identify the value of r square 0.816 > 0.7 which is significance at <.001 showing significant regression level

in the model of study. Also the value of R as 0.907 > 0.7 which is significant at <.001. Nomo logical validity shows the ability of a scale to behave as expected with respect to some other constructs to which it is related [37].

Hypothesis verification

H11: There is positive relationship between artificial intelligence and customer support system.

In Table 4. The P value of the path from artificial intelligence to customer support system is <0.001, lesser than 0.05, indicating that the causation relationship is significant, and the hypothesis that artificial intelligence has a significant positive impact on customer support system is proved. Artificial intelligence for customer support system is a positive factor that results in relationship of artificial intelligence with the coefficient of 0.138 (t =5.199) with <.001 significance level. Therefore, hypothesis H11 is accepted.

Table 2: Reliability & Validity test

KMO and Bartlett's Test	Greater than 0.6	
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	0.866768537	
Bartlett's Test of Sphericity	Approx. Chi-Square	613.32315
	df	105
	sig	<0.0001
Reliability Statistics	Greater than 0.6	
Cronbach's Alpha	0.877630541	
N OF ITEMS	18	

Table 3: Regression Model Summary

Regression Model Summary					Sig.	
Model	R	R Square	Adjusted R Square	Std. Error of theEstimate		
1	.907a	0.816	0.832	0.305	<.001b	
ANOVAa						
	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	77.239	5	18.820	203.304	<.001b
	Residual	15.922	182	0.094		
	Total	93.161	187			

Table 4: Coefficient of Regression

		Coefficients				
		Unstandardized Coefficients		**Standardized Coefficients**	**t**	**Sig.**
	Model	**B**	**Std. Error**	**Beta**		
1	(constant)	36.177	0.357		15.02	<0.001
2	Customer Support System	0.127	0.04	0.158	5.179	<0.001
3	Privacy & Security	0.246	0.045	0.363	5.528	<0.001
4	Database Management System	.388	0.034	0.354	8.776	<0.001
5	Trust	0.285	0.043	0.362	7.839	<0.001
6	Bonding	0.289	0.036	0.337	5.061	<0.001
7	Communication	0.161	0.039	0.284	5.156	<0.001
8	Shared value	0.273	0.041	0.375	6.563	<0.001
9	Empathy	0.225	0.033	0.283	4.741	<0.001
10	Reciprocity	0.362	0.046	0.296	5.261	<0.001

H12: There is positive relationship between artificial intelligence and privacy & Security

In Table 4. The P value of the path from artificial intelligence to privacy & Security is <0.001, lesser than 0.05, indicating that the causation relationship is significant, and the hypothesis that artificial intelligence has a significant positive impact on privacy & Security is proved. Artificial intelligence for privacy & Security is a positive factor that results in relationship of artificial intelligence with the coefficient of 0.138 (t =5.199) with <.001 significance level. Therefore, hypothesis H12 is accepted.

H13: There is positive relationship between artificial intelligence and Database management system.

In Table 4. The P value of the path from artificial intelligence to Database management system is <0.001, lesser than 0.05, indicating that the causation relationship is significant, and the hypothesis that artificial intelligence has a significant positive impact on Database management system is proved. Artificial intelligence for Database management system is a positive factor that results in relationship of artificial intelligence with the coefficient of 0.138 (t =5.199) with <.001 significance level. Therefore, hypothesis H13 is accepted.

Findings of study

The significance and originality of the current paper are attributed to its commitment to the reliability analysis requirement. The findings of this study show that artificial intelligence plays a big role in customer relationships in the banking business in many beneficial ways. This study clarifies how relationship marketing by banks employs artificial intelligence. This study demonstrates how banks can utilize artificial intelligence to interact with clients about different programmed, bond yields, fees, etc. Because of its simplicity of use, time-saving capabilities, and comfort for consumers, artificial intelligence can be useful for banks in a variety of customer support management solutions, database management services, privacy, and security applications.

For customers with limited funds, chatbots, virtual assistants, and CRM are the greatest option for quicker responses at lower cost and effort. AI-based financial services can be utilized to offer a user-friendly experience so that clients can get in touch with them and ask questions to learn more about the products before completing a transaction. Customers can be comfortable using banking services, and they can undoubtedly assist in managing and provide advice on spending and

saving habits. Customers can take use of responsive and prompt services 24/7 from customer care management, as opposed to email or person adviser. The four elements of credibility— honesty, knowledge, reputation, and predictability—can be firmly upheld by banks to ensure the reliability of their consumer services.

Customers can receive critical info from institutions about trades, deposits accounting system, upcoming installments, credit or debit card history, repayment schedule, and credit limitations as a messaging and can rapidly make payments through multimedia devices based on artificial intelligence. Banking services have been determined to secure consumer personal details and not share it with other websites in terms of security and privacy. However, due to their vulnerability to several threats, banks must implement security control measures that secure message transmission, authentication, secrecy, and privacy

Conclusion

Every day, millions of clients conduct many transactions. Customers created the data, which is managed and saved in a sizable database. Additionally, a lot of manual labour is required to complete the majority of banking business activities. They can now easily cut back on manual labor on both the employee and consumer sides due to AI. Because of AI, this previously impossible, complex task has been reduced to a simple one (Artificial Intelligence). The banking industry has been enhancing relationship management by offering a variety of useful instruments to guarantee security, comfort, and stability.

It is advisable to incorporate those technologies into the various industries of business since they are always improving. Modern technology must be used to preserve and improve security in the financial system, and other sectors of the banking sector are prepared to adopt the newest innovations. Customers now want their banks to be innovative in this digital age. The opportunity to upgrade technology will raise the level of service and security and enhance the bank's reputation. Due to their efficiency and user-friendliness, internet and phone banking are appealing to clients

nowadays. Numerous studies demonstrate that several models are introduced to enhance the process' accuracy, enhancing the customer-banking connection and producing a win-win scenario for all parties involved.

Banks must adopt the newest, most popular technologies of the modern age to boost their relationship marketing tactics because of competition with non-banking sectors. The banking sector has benefited more from automation. Artificial intelligence techniques should be employed in the banking sector to improve the speed and creativity of client banking transactions. Fortunately, AI has been offering a wide range of applications to help banks operate as efficiently as possible, opening the door for a new level of financial services.

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