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Efficacy of Artificial Intelligence on Banking Sector

Dr. R. Uma[1] and R. Harini[2]

Abstract

The purpose of the study humans and machines are working together in banking today. Banking sectors are intervening to use this information to enhance client relationships. The methodology of the study, the systematic literature study has been collected to analyze relevant studies between artificial intelligence and banking. Primary and secondary data has been used for the study. Convenience sampling has been used. The objective of the study, to analyze the driving factors of consumer's adoption on artificial intelligence in banking sector, customer awareness on artificial intelligence technology overall performances in banking sector, artificial intelligence tools in banking sector. Result of the study Tools of artificial intelligence in banking has positively associated with age. Multiple regressions have good fit structured model. Sampling tools have been used Multiple Linear regression, Annova and Descriptive statistics in SPSS Version 23.

Keywords: Artificial Intelligence, Banking, Chatbot, Customers awareness.

INTRODUCTION:

Artificial Intelligence is the theory and development of computer systems which are able to perform tasks that normally require human intelligence, such as visual perception, speech recognition, decision-making, and translation between languages Jewandah (2018).

AI IN BANKING:

The banking industry is utilizing artificial intelligence to achieve new levels of customer relationship management. Banks and other financial institutions are increasingly using artificial intelligence (AI) technology for a variety of tasks, such as enhancing customer

[1] Associate Professor, Research Supervisor & Convenor, PG & Research Department of Commerce, Anna Adarsh College for Women, Anna Nagar, Chennai 600040.

[2] Research Scholar, Ph.D (Full time), Anna Adarsh College for Women, Anna Nagar, Chennai 600040.

service by utilizing virtual assistants or credit scoring for accurately determining a borrower's risk. One of the biggest uses of AI in the banking industry, however, is the fight against fraud and money laundering. With the help of artificial intelligence (AI) in finance, banks are able to organize enormous quantities of data at lightning-fast speeds to gain valuable information and better understand the behavior of their customers. Artificial intelligence in finance can now tailor financial goods and services due to the ability to offer customized features and simple interactions, resulting in significant consumer engagement and strong client relationships. For the purposes of restructuring the description, the following positive effects are in use:

- more responsive service
- lessening of human error
- Developing options for individualization
- increasing customer satisfaction and trust to strengthen customer base
- cutting down on travel time

AI APPLICATIONS IN BANKING:

CYCBER SECURITY AND FRAUD DEDUCTION:

Users use apps or online accounts to pay bills, withdraw cash, deposit checks, and carry out a variety of other digital transactions every day. As a result, the banking industry needs to step up its efforts to detect fraud. AI and machine learning assist banks in spotting fraudulent activity, tracking system flaws, reducing risks, and enhancing overall online financial security.

CHATBOTS:

A Chatbot is a technology service powered by algorithms that interacts with a customer in a natural (human-like) manner, either by voice or text. Chatbot are software programs which can interact with human users via written or spoken communication channels using natural language (Shawar and Atwell, 2007). Banks can guarantee they are accessible to their customers 24 hours a day by implementing Chatbot into their banking apps. Additionally, Chatbot might offer tailored customer support, mitigate the workload on emailing and other channels, and suggest suitable financial products and services by understanding customer behaviour.

LOANS AND CREDIT DECISIONS:

In order to make better, safer, and more profitable loan and credit decisions, banks have begun implementing AI-based systems. Presently, many banks still only consider a person's or business's creditworthiness based on their credit history, credit scores, and customer references. Customers with little credit history can use an AI-based loan and credit system to analyse their patterns of behaviour to assess their creditworthiness. Additionally, the system notifies banks of specific actions that might raise the risk of default. In short, these technologies are significantly altering the way that consumer lending will be done in the future.

PROCESS AUTOMATION:

According to AT Kearney, Robotic Process Automation (RPA) makes operations 20 times faster than the average humans and includes benefits of 25% to 50% cost savings for

those who adopt. RPA is successfully used by banking institutions to speed up transactions and improve productivity. For instance, Coin technology from JPMorgan Chase reviews documents and extracts data from them much more quickly than humans can. To find out how RPA is changing the insurance industry, read the blog that is linked.

PREDICTIVE ANALYTICS:

Predictive analytics and general-purpose semantic and natural language applications are two of the most frequently used use cases of AI in the banking sector. Data can have specific patterns and correlations that AI can identify that were previously invisible to traditional technology. These patterns might point to underutilized cross-sell or sales opportunities, operational data metrics, or even revenue-impacting metrics.

RISK MANAGEMENT:

By analyzing their plans, learning from past failures, and removing human error, the banks can manage risk thanks to the vast data bank made available by AI-powered systems. AI is advancing into the core of banking security procedures to encrypt each step with codes that authenticate transactions and inform businesses about fraud and money-laundering prevention efforts. Regulations like Know Your Customers (KYC) checks aid in stepping up security precautions.

REVIEW OF LITERATURE:

A. Geetha, the study focused on artificial intelligence and financial services in Chennai. Banks and financial services can manage the transaction data generated by proliferation of digital payments and banking to better management and respond to consumer behavior. The primary data is collected through artificial intelligence application. Result of the study showed, private banks and financial services are using various platform tools for customer benefits so that customer satisfaction with their services in order to improve services in an effective manner because some customers dissatisfied with banking services. Suggestion of the study, customer more committed from representatives to the banking and financial services by developing innovative preparation to implement artificial intelligence in the work place.

Leonard Shambira (2020), study examined, Artificial intelligence in Zimbabwe banking, objectives of the study that the adopting artificial intelligence in the banking sector and barriers of artificial intelligence. The primary data was collected from 120 bank employees across ten banks. Result of the study, artificial intelligence embedded in bank to enhance process controlled of the surveyed bank and adopted some form of AI to enhance customer intention and experience in the form of Chatbot.

Amer Aivad Alzaidi (2018), study analyzed, the adoption of AI in bank sector of Middle East. The data was collected from 200 bank employees from selected banks in the region. This survey is to gather information related and importance of AI in banking sector and understand its impact. The data was qualitatively analyzed using SPSS 21.0 Software.

Sharan Kumar Shetty, Cristi SPULBAR, Ramona BIRAU, Robert Dorin FILIP (2022) have analysed the implement of AI in banks impacted to the customers and bankers. 170 samples collected from customers and 30 from bankers from Axis bank, ICICI bank, Karnataka bank, HDFC bank etc., from banker point of view. Chi-square, correlation and regression test have been used for the study.

Monika Anetta ALT, Ibolya VIZELI, ZSUZSA SAPLACAN (2021) paper is to identify factors that influenced consumer intention to use Chatbot technology in banking industry. Hypothesis were framed based on technology acceptance with compatibility, customer perceived privacy risk and awareness of the service. 287 samples were collected 24% have previously used Chatbot. Partial least square structural equation modelling test has been used in this study. Result of the study, perceived compatibility and use in adoption of bank Chatbot technology. Awareness has an effect of perceived ease of use, perceived privacy risk it has affects usage intention on bank chat through perceived usefulness. Perceived ease of use and perceived privacy risk has no effect on usage intention.

OBJECTIVES:

1. To identify the driving factors of consumers adoption on artificial intelligence in banking sector.
2. To know customer awareness on artificial intelligence technology overall performances in banking sector.
3. To study the artificial intelligence tools in banking sector.

RESEARCH METHODOLOGY:

Sample size	55 Respondents
Sampling techniques	Convenience Sampling
Study area	Chennai, Tamil Nadu
Data collection	Primary and Secondary data
Targeted population	Consumers who have bank account
Software used	MS Excel, IBM SPSS Statistics Version 23.
Statistical tools used	Descriptive statistics, Multiple Linear Regression, One-way Annova.

RESEARCH GAP:

In the past study literature conducted, Banks and financial services can manage the transaction data generated by proliferation of digital payments and banking to better management and respond to consumer behavior. Adopting artificial intelligence in the banking sector and barriers of artificial intelligence. To gather information related and importance of AI in banking sector and understand its impact. To know the implement of AI in banks impacted to the customers and bankers. Factors that influenced consumer intention to use chatbot technology in banking industry. In this study conducts to analyse, To identify the driving factors of consumers adoption on artificial intelligence in banking sector, customer awareness on artificial intelligence technology overall performances in banking sector, artificial intelligence tools in banking sector.

DATA ANALYSIS AND INTERPRETATION:

Table 1.1: Demographic details

Demographic	Responders	Frequency
Age		
18-30	28	51%
31-40	8	15%
41-50	7	12%
51-60	10	18%
More than 60	2	4%
Gender		
Male	40	73%
Female	15	27%
Qualification		
Undergraduate	25	46%
Postgraduate	20	36%
Professional	10	18%
Area of Residence	35	64%
Urban	3	5%
Rural	17	31%
Semi-urban		
Total	**55**	**100%**

Source: Primary data

INTERPRETATION:

The above table 1.1 shows demographic details, the majority of the respondents age group **18-30 (51%),** majority of the gender are Male **73%**, qualification of the responders are Undergraduate **46%**, and area of residence urban **64%**.

Objective 1: To identify the driving factors of consumer's adoption on artificial intelligence in banking sector.

Table 1.2: Error reduction

S.No.	Opinion	Frequency	Percentage
1	Strongly disagree	5	9.1
2	Disagree	6	10.9
3	Neutral	17	30.9
4	Agree	14	25.5
5	Strongly agree	13	23.6
	Total	**55**	**100.0**

Source: Primary data

INTERPRETATION:

The above table 1.2 observed that the **30.9 %** of the respondents have neutral and **25.5%** agreed and **23.6 %** of the respondents strongly agree with the statement of error reduction. Only **10.9 %** of them are disagree and **9.1%** of the responders are strongly disagree the statement.

Table 1.3: Increased work efficiency

S.NO	Opinion	Frequency	Percentage
1	Strongly disagree	4	7.3
2	Disagree	3	5.5
3	Neutral	10	18.2
4	Agree	9	16.4
5	Strongly agree	29	52.7
	Total	**55**	**100.0**

Source: Primary data

INTERPRETATION:

The above table 1.3 observed that the **52.7%** of the responders are strongly agree, **18.2%** have neutral and **16.4%** of the responders are agree with the statement that increased work efficiency. **5.5%** are disagree and **7.3%** of the responders are strongly disagree with the statement.

Table 1.4: Reduced cost of the operation

S.NO	Opinion	Frequency	Percentage
1	Strongly disagree	3	5.5
2	Disagree	5	9.1
3	Neutral	16	29.1
4	Agree	7	12.7
5	Strongly disagree	24	43.6
	Total	**55**	**100.0**

Source: Primary data

INTERPRETATION:

The above table 1.4 observed that the **43.6%** of the responders are strongly agree, **29.1%** of the respondents neutral, **43.6%** are agree with the statement that reduced cost of the operation. **9.1%** of them are disagree and 5.5% of the respondents strongly disagree with the statement.

Table 1.5: Efficient decision making

S.NO	Opinion	Frequency	Percentage
1	Strongly disagree	2	3.6
2	Disagree	7	12.7
3	Neutral	17	30.9
4	Agree	17	30.9
5	Strongly agree	12	21.8
	Total	**55**	**100.0**

Source: Primary data

INTERPRETATION:

The above table 1.5 observed that the **30.9%** of the respondents are agree and neutral, **21.8%** of the respondents are agree with the statement that efficient decision making. **12.7%** are disagree and **3.6 %** are strongly disagree with the statement.

Table 1.6: Descriptive Statistics

Variables	N	Mean	Std. Deviation
Error reduction	55	3.4364	1.22872
Increased work efficiency	55	4.0182	1.26916
Reduced cost of the operation	55	3.8000	1.25314
Efficient decision making	55	3.5455	1.08556

Source: Primary data

INTERPRETATION:

The above table 1.6 shows, the mean score of Error reduction is **3.43** with a standard deviation of **1.228.** The standard deviation is less than 1/3rd of the mean. Mean score of Increased work efficiency is **4.01** with a standard deviation of **1.269.** Mean score of reduced cost of the operation is **3.80** with a standard deviation of **1.253**. Mean score of efficient decision making is **3.54** with standard deviation of **1.085**.

Table 1.7: Descriptive Statistics

Variables	N	Mean	Std. Deviation	Rank
Error reduction	55	3.4364	1.22872	III
Increased work efficiency	55	4.0182	1.26916	I
Reduced cost of the operation	55	3.8000	1.25314	II
Efficient decision making	55	3.5455	1.08556	IV

Source: Primary data

INTERPRETATION:

The above table 1.7 shows, on the basis of mean value, ranks assigned by the respondents. Increased work efficiency **(4.01),** reduced cost of the operation **(3.80),** Error reduction **(3.43)** and efficient decision making **(3.54).**

Table 1.8: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Qualification	55	1.00	3.00	1.7273	.75656	.506	.322	-1.068	.634
Valid N (listwise)	55								

Source: Primary data

INTERPRETATION:

The above table 1.8 shows, the mean score of qualification the driving factors consumers adoption of AI at bank by the respondents is **1.72** with a standard deviation of **0.756**. Further, the skewness is positive **(0.506),** thus the data is skewed right, the kurtosis is negative (**-1.068).** This further proves that the mean is the representative value.

Objective 2: To know customer awareness on artificial intelligence technology overall performances in banking sector.

Multiple Linear Regression

Ho: There is no significant relationship between AI will reduce the work of customers and customer awareness on artificial intelligence technology overall performances in banking sector.

H1: There is significant relationship between AI will reduce the work of customers and customer awareness on artificial intelligence technology overall performances in banking sector.

Table 1.9: Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.923[a]	.852	.840	.19777	.972
a. Predictors: (Constant), Asset management, Risk management, Customer satisfaction, Eliminating human errors					
b. Dependent Variable: AI will reduce the work of customers					

Source: Primary data

ANOVA[a]						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	11.244	4	2.811	71.872	.000[b]
	Residual	1.956	50	.039		
	Total	13.200	54			

Source: Primary data

INTERPRETATION:

Table 1.9 shows, Model reveals that R (multiple correlation coefficient) value was **0.923**. It measures the degree of relationship between AI will reduce the work of customers and asset management, risk management, customer satisfaction and eliminating human errors. R Square (Coefficient of Determination) value was **0.852**. It means that about **85%** of the variation in AI will reduce the work of customers is explained by the variation in the independent variables' asset management, risk management, customer satisfaction and eliminating human errors. Adjusted R-squared value was **0.840**. It adjusts the statistic based on the number of independent variables in model. That is the desired property of a goodness of fit statistics. Durbin Waston (DW) statistic shows **0.972** indications no auto correction.
F value was **71.872** and P value was significant at % level. Hence there is significant relationship between dependent and independent variables.

Table 1.10 Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.069	.408		.168	.867
	Customer satisfaction	.134	.054	.309	2.465	.017
	Risk management	-.044	.047	-.107	-.927	.358
	Eliminating human errors	.432	.075	.722	5.754	.000
	Asset management	-.198	.032	-.428	-6.168	.000
a. Dependent Variable: AI will reduce the work of customers						

Source: Primary data

Estimated Multiple Regression Equation
Y= 0.867+0.134X1-0.044X2+0.432X3-0.198X4
Where,
X1= Customer satisfaction
X2= Risk management
X3= Eliminating human errors
X4 = Asset management

The coefficient of X1 shows that 1increase in the value of price would rest in 0.134 (13.4%) increase the customer awareness, other variables being held constant. The coefficient value is significant at 1% level and the t-statistics of customer satisfaction also accounted for significant positive variation in dependent variable that is awareness of the consumers.
The coefficient of X2 shows that 1increase in the value of price would rest in 0.044 (44%) decrease the customer awareness, other variables being held constant. The coefficient value is

significant at 1% level and the t-statistics of risk management also accounted for significant negative variation in dependent variable that is awareness of the consumers.

The coefficient of X3 shows that 1increase in the value of price would rest in 0.432 (43.2%) increase the customer awareness, other variables being held constant. The coefficient value is significant at 1% level and the t-statistics of Eliminating human errors also accounted for significant negative variation in dependent variable that is awareness of the consumers.

The coefficient of X4 shows that 1increase in the value of price would rest in 0.198 (19.8%) decrease the customer awareness, other variables being held constant. The coefficient value is significant at 1% level and the t-statistics of Asset management also accounted for significant negative variation in dependent variable that is awareness of the consumers.

Objective 3: To study artificial intelligence tools in banking sector

Ho: There is no significant relationship between artificial intelligence tools in banking sector and age.

H1: There is significant relationship between artificial intelligence tools in banking sector and age.

Table 1.11: ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Cyber security and fraud deduction	Between Groups	24.963	4	6.241	5.517	.001
	Within Groups	56.564	50	1.131		
	Total	81.527	54			
Chatbot	Between Groups	51.125	4	12.781	17.822	.000
	Within Groups	35.857	50	.717		
	Total	86.982	54			
Loans and credit decisions	Between Groups	26.389	4	6.597	5.647	.001
	Within Groups	58.411	50	1.168		
	Total	84.800	54			
Process automation	Between Groups	49.681	4	12.420	30.399	.000
	Within Groups	20.429	50	.409		
	Total	70.109	54			
Predicted analytics	Between Groups	65.834	4	16.459	59.310	.000
	Within Groups	13.875	50	.278		
	Total	79.709	54			

Source: Primary data

INTERPRETATION:

The above table 1.11 shows, the p value of variables namely chatbot, process automation and predicted analytics are less than **0.01,** at the **1%** level of significance. cyber security and fraud deduction, loans and credit decisions, are less than **0.05**, at the **5%** level of significance. Hence null hypotheses are rejected for these variables. It concludes that there is a significant different between these variables and age of the respondents.

SCOPE FOR FURTHER STUDY:

This study focused on artificial intelligence on banking sector in Chennai city. Further it can be analyzed regions across the globe. In the study analyzed the factors adopting artificial intelligence in banking, tools of artificial intelligence in banking and overall performance in the banking sector. In the further study can analyze challenges faced in artificial intelligence and technology banking like machine learning in banking industry. Further investigations can be carried out to analyze the impact of new technology adaptations on banking sector.

CONCLUSION:

Artificial intelligence applications paint a clear picture of what to expect in terms of the advantages of using artificial intelligence in banking. On the progress scale, their emphasis on reaching new heights in customer relationship improvement through digitization is increasing. Despite obstacles like cyber threats from cybercrimes, conventional banking practices, a lack of training, etc., the banking industry is imagining technology-focused services into the core functions of banks. In order to improve customer interaction and experience, few banks have implemented AI. Only three banks currently offer Chatbot on the WhatsApp platform; however, they have not yet embraced other AI services like voice banking or robo-advisers. Advice, biometric authorization and authentication, and form-based customer segmentation to ensure that the most pertinent information is presented, use customized websites targeted clients. Tools of artificial intelligence in banking have positively associated with age. Multiple regression has good fit structured model.

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