Ai Implementation in Digital Payment: An Empirical Analysis on Banking Sector in India
website: https://www.seejph.com/index.php/seejph/index
South Eastern European Journal of Public Health, ISSN: 2197-5248;
Volume XXV, S2,2024Posted: 05-12-2024

AI IMPLEMENTATION IN DIGITAL PAYMENT: AN EMPIRICAL ANALYSIS ON BANKING SECTOR IN INDIA

[1]Dr Parimal Kumar, [2]Dr. Percy Bose B, [3]Dr. Nupur Angirish, [4]Dr. Purushottam Bung
[5]Dr Rajni, [6]Dr. Irshad Ahmad

[1]Assistant Professor, Birla Global University, Bhubaneswar
[2]Associate professor and Head, Department of MBA, Jyoti Nivas College Autonomous, Bengaluru, Karnataka.
Email: percyboseb@jyotinivas.org
[3]Associate Professor, GIDC Rajju Shroff ROFEL Institute of Management Studies,RSRU, Vapi Gujarat , India
Email: angirish_nupur@yahoo.co.in
[4]Professor and Director, R V Institute of Management, Bangalore, India
Email: bunguas@gmail.com
[5]Associate Professor, Department of Commerce, Kalindi College
University of Delhi, India. Email rajni@kalindi.du.ac.in
[6]Director Research, ARSEAM Foundation, Bareilly, U.P., India
ORCID: https://orcid.org/0009-0000-2510-1797 Email: drirshadafu@gmail.com

Keywords:
Artificial Intelligence, Risk management, Chatbots, Automation, Fraud detection, Intelligent & Logical Decision Making, Digital Payment system

ABSTRACT
To study AI Implementation in Digital Payment, as an empirical analysis on Banking Sector in India. Questionnaires comprised of closed-ended questions were given out in order to accomplish these objectives. The elements of the proposed model were evaluated using the validity, correlation, and reliability analyses. Regression analysis was used to confirm the proposed model and test the hypothesis further. Findings shows Thus, with a R square of 0.813, all variables account for 90% of the digital payment system. The regression model's ANOVA values show validation with a 95% confidence level. In the coefficient summary, the beta values of every factor are 0.902, which is a fair depiction of their impact on Digital Payment system. Practitioners and marketers in the Indian banking industry might benefit from the insights this research offers. We encourage banking professionals to think about improving their usage of AI in the credit scoring, analysis, and granting processes in order to decrease risk, save costs, and enhance customer experience. This will help with the deployment of AI-based decision-making. In addition to enabling banks to automate their knowledge workers, artificial intelligence (AI) will make automation more intelligent overall, eliminating competitiveness and security dangers. Banks will be able to provide individualized services and increase operational and financial savings by making the most use of human and machine capabilities thanks to AI. As AI is used more widely in banking, authorities working to maintain financial stability while improving consumer protection and fostering innovation will face both new opportunities and difficulties. It offers the banking industry fantastic chances to improve customer experience democratize financial services, bolster risk management, and better cyber-security and consumer protection.

1. INTRODUCTION

The digital payments area has changed a lot lately, especially in Indian banking, where using AI, or artificial intelligence, has grown to be a significant component of new ideas. As India quickly shifts to a cashless system, banks are using AI to make operations better, enhance customer service, and reduce risks in financial transactions. This analysis will look into the different effects of using AI in digital payments, examining how these advancements not only make processes easier but also support financial inclusion and safety. Using information from various banks in India, the study will highlight the issues and chances brought by this technological change, considering its ability to change the future of banking and payment systems in a connected world. Knowing these aspects is vital for those looking to deal with the difficulties in this growing area.

Artificial intelligence (AI) applications in the banking industry in India is important for improving digital payments, as it helps with efficiency and trust. Banks are using AI technology more to make things easier, cut costs, and improve customer service with personalized options. This shift in technology matters more now as people want easy digital payment solutions, pushing banks to use advanced data analysis and machine learning. Research shows that using AI can automate regular tasks and make better decisions by using data more effectively, as shown in (Bedarkar et al., 2023). Also, as new technologies like blockchain start to get more interest, their combination with AI is set to change how banks handle secure and efficient transactions, highlighting the need for cross-field knowledge and creativity, as highlighted in (Arjun et al., 2022). This connection between AI and digital payments is crucial for making India a key player in the global financial system.

- **Current Trends in AI Implementation in Digital Payments**

The area of digital payments in India is changing a lot because of Artificial Intelligence (AI) use. Banks are using AI more to make things run smoother and to connect better with customers, showing a general trend to boost service quality and the client happiness. AI's application in a number of operations been found to not only make transactions faster but also to allow for more tailored customer interactions, especially through chatbots, which have become a regular part of online banking apps (Bhattacharya et al., 2022). Also, as technology continues to develop, fitting new solutions into banking processes is becoming key for banks to keep their customers loyal amid growing competition (MAINETTI L et al., 2022; *Philip V. 2020*). These improvements highlight how important AI is in transforming digital payment systems, creating a banking experience that is more user-friendly and quicker to respond.

The use Baking's use of artificial intelligence (AI) has evolved customer experience a lot by improving personalization, efficiency, and access. AI tools like chatbots and virtual helpers make it easy for customers to interact, helping them with complicated processes without needing people. These chatbots play a key role in connecting what consumers want with the banking services, as shown in our study that looks closely at how they are customized for the best results in the industry (Adil et al., 2024). Also, AI supports predictive analytics, which helps banks guess what customers will need and prefer, boosting loyalty and satisfaction. Using blockchain can make this even better by enhancing security and transparency, both of which are crucial for creating trust in digital payments (Kshetri et al., 2018). In the end, the combined benefits of AI and blockchain technologies can offer significant advantages for both customers and banks, changing the overall banking experience in India.

The arrival of AI-based tools in digital payments has improved user experience and customer happiness in the banking industry in India. By using smart algorithms, banks can provide services that fit the individual needs of customers, which builds more trust and loyalty. For example, using chatbots on online banking sites offers instant help, letting users carry out transactions easily and reducing wait times. This engaging interaction not only makes payments easier but also quickly answers customer questions, showing how important personalization is for user involvement. Studies show that effective banking processes, supported by AI, really affect how satisfied customers are, especially as tech-savvy individuals want smooth and flawless service experiences (Bhattacharya et al., 2022). As companies keep innovating and adjusting their plans to new technology trends, AI's function in user experience is likely to grow, promoting a more inclusive financial environment (Aßmann et al., 2024).

2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

- **Digital payment systems in India**

The fast change of India's electronic payment systems shows a big shift in how financial transactions happen, making them easier and more efficient. As many people get linked through mobile technology, these systems help include more people in banking services, even those who were not well-served before. The use of AI in these digital platforms is key for better risk management, quick fraud detection, and automating customer service with smart chatbots. By using user data, AI helps in making better decisions, which allows banks to change services to meet individual needs. This change gets stronger as more banks start using AI technologies, as seen in a study of companies that use AI to make their operations smoother and improve customer experiences (Gupta et al., 2022). As a result, digital payment systems are not just important for economic growth but also for the ongoing modernization of India's banking sector (Sharma et al., 2023).

- **AI in Risk Management**

Risk management with the application of artificial intelligence (AI) in banks is important for improving how they operate and reducing risks. By using AI-based tools, banks can better find and analyze risks, which allows for quicker decisions and custom solutions for customers. This change is especially vital for digital payments, where many transactions require careful management. As banks deal with regulations and customer demands in a tech-driven world, AI helps automate tasks that used to need human input, which cuts down on mistakes and speeds things up. Also, research shows that AI can enhance customer experiences, showing its importance in building trust and loyalty, particularly in cities where customers with tech skills expect smooth services (Bhattacharya et al., 2022). Moreover, knowing how fintech has changed makes it clear that banks must use AI for effective risk management so they can stay competitive as the environment shifts quickly (Dr. S Rajarajeswari et al., 2021).

H1a: AI (artificial intelligence) positively impacts risk management (RISK)

HIb: Risk management (RISK) has a negative influence on Digital Payment system (DPS)

- **AI chat bots in Customer Service**

Using chatbots in customer service in banking has changed how banks talk to their customers. With Artificial Intelligence, banks can give help all the time, which cuts wait times and makes customers happier. This is especially true in big cities in India, where tech-savvy customers want fast and personalized banking (Bhattacharya et al., 2022). Chatbots can answer many questions, like giving account details or helping with loans, which makes things run smoother and lets human workers deal with harder issues. Also, their link to fraud detection systems allows for checking transactions quickly, warning customers about suspicious actions right away (Andriansyah et al., 2023). So, chatbots not only make customer interactions better but also strengthen banks' risk management methods, making them a key part of modern digital payments.

In the fast-changing world of digital banking, using AI chatbots to boost customer engagement has become an important approach. AI chatbots give immediate help any time of day, greatly improving how quickly customers get responses and their level of satisfaction. By quickly dealing with questions and worries, these chatbots not only make the customer experience more engaging but also collect important information about customer habits and likes, helping banks adjust their services better. Also, chatbots make it easier to handle simple transactions, reducing the workload on human agents so they can focus on harder tasks. This twofold advantage shows that AI is

not just for automation but is also for building better customer relationships and trust in banking. Moreover, as shown in related research, using these technologies wisely can be vital in strengthening customer connections and increasing overall engagement (Kak A et al., 2023).
H2a: The application regarding artificial intelligence (AI) is beneficial for Chat bots (CHAT)
H2b: Chatbots (CHAT) has a positive influence on Digital Payment system (DPS)

- **AI and Automation**

The integration of automation in digital payments is revolutionizing the banking sector in India, significantly enhancing efficiency and accessibility. This shift toward automated systems allows for streamlined transaction processes, cutting down on time and potential errors connected to manual operations. As noted in recent analyses, emerging technologies like block chain and Automation of robotic processes are at the forefront of this transformation, enabling more secure and efficient transactions (Chaudhary et al., 2023). Moreover, such advancements facilitate financial inclusion by delivering critical financial services to underrepresented populations, thereby addressing the challenge that over 2 billion individuals face in accessing formal financial systems (Lamb J et al., 2013). By leveraging artificial intelligence, banks can optimize decision-making processes and tailor services In order to satisfy their clients' varied needs, thus reinforcing the vital role of automation in fostering a more equitable financial landscape in India's evolving digital economy (Lamia H, 2022).

Artificial intelligence (AI) integration in the banking industry, particularly in digital payment systems, has revolutionized the efficiency of payment processing while significantly reducing transaction times. Real-time analysis of enormous volumes of data by AI algorithms allows faster verification of transactions and minimizing the likelihood of fraud. This rapid processing is critically important, as even minor delays can lead to lost customer trust and opportunities; thus, streamlining these systems is paramount. Moreover, AI enhances decision-making through predictive analytics, allowing banks to anticipate customer needs and tailor offerings accordingly. Such capabilities are essential in fostering financial inclusivity, particularly in developing regions, as they not only uplift individual financial stability but also stimulate broader economic growth (Lamb J et al., 2013). As emerging technologies like blockchain and robotic process automation further evolve, the synergy with AI in the banking sector promises to create increasingly robust and adaptable payment solutions, thereby cementing its role as a catalyst for innovation (Chaudhary et al., 2023).

H3a: The application regarding artificial intelligence (AI) is beneficial for Automation (AUTO)
H3b: Automation (AUTO) has a positive influence on Digital Payment system (DPS)

- **AI in Fraud Detection**

Making use of Artificial Intelligence (AI) for detecting fraud changes how Indian banks handle risk management. Old systems, usually based on simple rules, are not good enough for spotting complex fraud that changes quickly. AI improves fraud detection with advanced methods like machine learning and deep learning, helping systems look at large amounts of data quickly to find signs of fraud in real-time. Additionally, AI can use Enhancing Know Your Customer (KYC) procedures with Natural Language Processing (NLP) by checking customer identities through text analysis. Using graph analytics gives a clear view of how transactions connect, which helps find suspicious activity. Therefore, AI not only makes fraud detection stronger but also simplifies processes needed for following rules and laws, creating a safer banking setting (Andriansyah et al., 2023; Bhattacharya et al., 2022).

Using Artificial Intelligence (AI) for finding fraud has shown good results, especially in areas where financial crime is common, like India. Studies show that banks using AI also look at transaction patterns have cut down on fraud cases a lot. For example, by using machine learning methods, banks can spot issues quickly, which lets them act fast. This early action is very important; reports say that fraud makes up more than 40% of crimes in some places, including India, Ghana, and Nigeria (Button et al., 2024). Also, using AI systems not only helps find fraud better but also builds user trust by making transactions safer. In the end, these tech improvements are key for boosting efficiency and protecting digital payment systems from new threats (Nandi et al., 2019).

H4a: Artificial Intelligence (AI) contributes positively to Fraud detection (FRAUD)

H4b: Fraud detection (FRAUD) has a positive influence on Digital Payment system (DPS)

- **AI and Intelligent Decision Making**

Artificial Intelligence's (AI) application in banking sector significantly enhances intelligent decision-making processes, particularly within the framework of digital payments. By leveraging cutting-edge tools like machine learning and predictive analytics, Financial firms are able to make inferences by analysing large volumes of data that inform strategic decisions. This capability allows banks to customize services based on individual customer preferences, enhancing user experience and satisfaction. Additionally, Automation powered by AI simplifies operational processes, reducing the likelihood of Human mistake as well as improving efficiency in transaction management. As highlighted, emerging technologies not only bolster operational performance but also pose inherent risks, necessitating a balance between innovation and risk management (Chaudhary et al., 2023). Furthermore, AI applications facilitate fraud detection and prevention, thereby instilling greater confidence in digital payment systems (Sharma et al., 2023). Consequently, the integration of artificial intelligence in judgement processes transforms the banking landscape, particularly in the context of India's evolving financial ecosystem.

H5a: Positive effects of artificial intelligence (AI) include Intelligent & Logical Decision Making (ILDM)

H5b:Intelligent & Logical Decision Making (ILDM) has a positive influence on Digital Payment system (DPS)

- **Conceptual Model**

Figure 1: Model that is suggested to illustrate the connection between influencing and dependent variables

3. RESEARCH METHODOLOGY

The Artificial Intelligence (AI), Risk management (RISK), Chatbots (CHAT), Automation (AUTO), Fraud detection (FRAUD), Intelligent & Logical Decision Making (ILDM), and Digital Payment System (DPS) are among the influencing and dependent factors that are included in the proposed

model (Figure 1). For the purposes of this study, we measured each factor according to the parameters that were considered. Although it makes sense to presume that there is a relationship between all the factors, this study also examines that relationship. In a pilot project, people of different ages' viewpoints were used to assess data collecting. An internet poll was used to test the study model. A total of 430 experienced users answered the survey. Those who contributed to the banking sector and were financial entrepreneurs were regarded as experienced users. 387 valid responses to the survey were obtained. We used IBM SPSS Statistics v.20 for our analyses. Utilizing factor analysis, the validity of the construct statements; regression analysis, test Cronbach's alpha and assumptions were utilized to evaluate the dependability of the proposed model We used descriptive statistics to create the demographic profile.

4. RESULTS

- **Demographic profile**

Descriptive demographic statistics, represented as a percentage, proportion, and frequency of occurrence, were used to assess the demographic features of the respondents. Information was obtained between April 2023 and May 2024 using a methodical questionnaire. Four hundred and thirty-three questionnaires were sent out to respondents using a combination of random and selective selection techniques. 387 of them were discovered to be fully finished and error-free. Upon closer examination, it can be seen that a response rate of 90% is considered superior quality. The socio demographic The participants' data is displayed in Table 1. The gender distribution of the 387 respondents showed that there were considerably more men (330, 85.3%) than women (57, 14.7%); most men (109, 28.2%) were between the ages of 30 and 39, and 170 (43.9%) had a professional degree and were earning more than 30,000 rupees (143, 37%).

Table1.DescriptiveStatisticsofDemographicProfile

		Frequency	Valid %
Gender profile	Male	330	85.3
	Female	57	14.7
Age profile	20-29 years	51	13.2
	30-39 years	109	28.2
	40-49 years	78	20.2
	50-59 years	93	24
	60 years and above	56	14.5
Highest education level	Bachelor Degree	43	11.1
	Masters Degree	103	26.6
	Professional Education	170	43.9
	Other	71	18.3
Income	10,000- 20,000	86	22.2
	20,001- 30,000	135	34.9
	30,001- 40,000	143	37
	More than 40,000	23	5.9

- **Exploratory Factor and Reliability Analysis**

The EFA was used to determine how important the compliant components were. In this experiment, a A threshold of 0.50 for factor loading is used. These results suggest that factor analysis is a suitable technique to collect this information. There were two components removed from the final analysis. due to loadings less than 0.5 were eliminated. A scale is generally accepted to be internally consistent if it satisfies the Chronbach's Alpha threshold of 0.70. 0 for the Cronbach's alpha level.7 was used in this study.

Table2. Results of Exploratory Factor Analysis

		Statement	Factor loadings	KMO Measure ofSampleAdequacy (>0.5)	Bartlett's Test of Sphericity		Items confirmed	Itemsdropped	Cum % ofloading
					Chi Square	Sig. (<.10)			
Artificial Intelligence (AI)	0.801	(AI)-1	0.897	0.753	727.261	0.000	5	0	56.660
		(AI)-2	0.725						
		(AI)-3	0.676						
		(AI)-4	0.577						
		(AI)-5	0.844						
Risk management (RISK)	0.712	(RISK)-1	0.749	0.726	283.423	0.000	4	1	43.022
		(RISK)-2	0.802						
		(RISK)-3	0.073						
		(RISK)-4	0.711						
		(RISK)-5	0.660						
Chatbots (CHAT)	0.958	(CHAT)-1	0.167	0.860	1770.498	0.000	4	1	71.576
		(CHAT)-2	0.932						
		(CHAT)-3	0.949						
		(CHAT)-4	0.953						
		(CHAT)-5	0.934						
Automation (AUTO)	0.735	(AUTO)-1	0.843	0.742	369.797	0.000	4	0	57.150
		(AUTO)-2	0.787						
		(AUTO)-3	0.592						
		(AUTO)-4	0.778						
Fraud detection (FRAUD)	0.974	(FRAUD)-1	0.954	0.720	4618.184	0.000	5	0	90.754
		(FRAUD)-2	0.947						
		(FRAUD)-3	0.954						
		(FRAUD)-4	0.959						
		(FRAUD)-5	0.950						
Intelligent & Logical Decision Making (ILDM)	0.892	(ILDM)-1	0.887	0.825	1261.903	0.000	5	0	69.969
		(ILDM)-2	0.911						
		(ILDM)-3	0.887						
		(ILDM)-4	0.792						
		(ILDM)-5	0.685						
Digital Payment system (DPS)	0.846	(DPS)-1	0.681	0.682	895.319	0.000	4	0	68.591
		(DPS)-1	0.861						
		(DPS)-1	0.935						
		(DPS)-1	0.815						

- **Correlatıon Analysis**

Both the dependent and independent variables have a significant association based on all the factors taken into account (Table 3). The variables for fraud detection (FRAUD) and intelligent & logical decision making (ILDM) had the highest level of correlation (0.946), while the variables for risk management (RISK) and artificial intelligence (AI) had the least significant relationship (0.688).

Table 3: Correlations

	AI	RISK	CHAT	AUTO	FRAUD	ILDM	DPS
AI	1						
RISK	.688**	1					
CHAT	.902**	.818**	1				
AUTO	.828**	.792**	.902**	1			
FRAUD	.847**	.797**	.918**	.837**	1		
ILDM	.835**	.804**	.929**	.848**	.946**	1	
DPS	.860**	.752**	.921**	.870**	.891**	.893**	1

**. Correlation is significant at the 0.01 level (2-tailed).

- **Regression Analysis**

To ascertain the predictor-criterion connection between the independent and dependent variables, The study employed stepwise regression analysis. The purpose of the research was to determine how artificial intelligence impacts digital payment systems used by Indian banks. Using step-wise regression analysis, Tables 4 and 5 demonstrated that the parameters under discussion are strong predictors of the digital payment system (DPS). With a R square of 0.813, Table 4 demonstrates that these variables explain 81.3% of the digital payment system (DPS). Table 5 shows the ANOVA results for the regression model, which show validity a 95% degree of confidence. Within the summary of coefficients shown in Table 6, the beta values of all the components are 0.902 and 0.847, which is a fair depiction of their impact on the digital payment system (DPS).

Table 4: Regression analysis

Model	Predictors	Dependent variable	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	AI	RISK	0.688	0.473	0.472	0.51619
2	AI	CHAT	0.902	0.813	0.813	0.41723
3	AI	AUTO	0.828	0.686	0.685	0.43902
4	AI	FRAUD	0.847	0.717	0.716	0.52087
5	AI	ILDM	0.835	0.698	0.697	0.46769
6	RISK, CHAT, AUTO, FRAUD, ILDM	DPS	0.934	0.872	0.870	0.30653

Table 5: ANOVA analysis

Model	Predictors	Dependent variable		Sum of Squares	df	Mean Square	F	Sig.
1	AI	RISK	Regression Residual Total	92.087 102.584 194.672	1 385 386	92.087 0.266	345.604	0.000

2	AI	CHAT	Regression Residual Total	291.415 67.021 358.436	1 385 386	291.415 0.174	1674.033	0.000
3	AI	AUTO	Regression Residual Total	162.030 74.206 236.235	1 385 386	162.030 0.193	840.654	0.000
4	AI	FRAUD	Regression Residual Total	264.354 104.454 368.808	1 385 386	264.354 0.271	974.363	0.000
5	AI	ILDM	Regression Residual Total	194.465 84.214 278.679	1 385 386	194.465 0.219	889.038	0.000
6	RISK, CHAT, AUTO, FRAUD, ILDM	DPS	Regression Residual Total	243.055 35.799 278.854	5 381 386	48.611 0.094	517.361	0.000

Table 6: Regression coefficients table for dependent variables

Model		**Dependent variable**	**Unstandardized Coefficients**		**Standardized Coefficients**		
			B	**Std. Error**	**Beta**	**t**	**Sig.**
1	AI	RISK	0.643	0.035	0.688	18.590	0.000
2	AI	CHAT	1.144	0.028	0.902	40.915	0.000
3	AI	AUTO	0.853	0.029	0.828	28.994	0.000
4	AI	FRAUD	1.090	0.035	0.847	31.215	0.000
5	AI	ILDM	0.935	0.031	0.835	29.817	0.000
6	RISK	DPS	-0.104	0.040	-0.087	-2.592	0.010
	CHAT		0.411	0.056	0.466	7.287	0.000
	AUTO		0.239	0.047	0.220	5.045	0.000
	FRAUD		0.195	0.052	0.224	3.709	0.000
	ILDM		0.132	0.065	0.132	2.034	0.043

- **Results of Hypotheses Testing**

Five All of the hypotheses that were first proposed in the conceptual study framework have been approved, as shown in table 7.

Table 7: SummaryofHypothesesTesting

Hy. No.	Independent Variables	Dependent Variables	R-Square	Beta Coefficient	t-value	SigVale	Status of Hypotheses
H1a	Artificial Intelligence (AI)	Risk management (RISK)	0.473	0.688	18.590	0.000	Accepted
H1b	Risk management (RISK)	Digital Payment system (DPS)	0.872	-0.087	-2.592	0.010	Accepted
H2a	Artificial Intelligence (AI)	Chatbots (CHAT)	0.813	0.902	40.915	0.000	Accepted
H2b	Chatbots (CHAT)	Digital Payment system (DPS)	0.872	0.466	7.287	0.000	Accepted
H3a	Artificial Intelligence (AI)	Automation (AUTO)	0.686	0.828	28.994	0.000	Accepted
H3b	Automation (AUTO)	Digital Payment system (DPS)	0.872	0.220	5.045	0.000	Accepted
H4a	Artificial Intelligence (AI)	Fraud detection (FRAUD)	0.717	0.847	31.215	0.000	Accepted
H4b	Fraud detection (FRAUD)	Digital Payment system (DPS)	0.872	0.224	3.709	0.000	Accepted
H5a	Artificial Intelligence (AI)	Intelligent & Logical Decision Making (ILDM)	0.698	0.835	29.817	0.000	Accepted
H5b	Intelligent & Logical Decision Making (ILDM)	Digital Payment system (DPS)	0.872	0.132	2.034	0.043	Accepted

5. DISCUSSION

The research findings (H1a and H1b) indicate a substantial negative association between Artificial Intelligence (AI) and Risk management (RISK) in the Digital Payment system (DPS). Risk management is proven to have a major impact on banks in financial activities, and many research use AI techniques for stress testing, default prediction, and credit rating (Kolari et al., 2019). Furthermore, AI techniques are also used to address other risks that the financial sector faces, like risk associated with operations. As an illustration, (Heidinger and Gatzert 2018) measured reputation risk using text mining methods. Additionally, text mining was used by (Saha et al. 2016) for processing loans study of fraud and by (Oral et al. (2020) for extracting data from a banking institution's internal documents. AI approaches are being used in systemic risk management by another group of studies. They examine and draw attention to the banking system's interconnection, which is a major factor in the risk of bank collapse spreading. They specifically address topics like distribution of assets (Pichler et al., 2020), Market liquidity, policy changes, and the use of cutting-edge data analytics techniques that depend on freshly created deep learning algorithms to detect systemic catastrophes (Lepetyuk et al., 2020;Tölö, 2020). Additionally, they enhance financial systems to reduce the overall risk associated with bank financing.

A strong positive link was found by conducting an empirical research into hypotheses 2a and 2b between AI, chatbots (CHAT), and digital payment systems (DPS). A bank's implementation of chatbots facilitates the banking procedure for staff members (Sarbabidya and Saha, 2020). Compared to a human counsellor, a Chabot advisor offers several benefits. Accordingly, there are benefits to using a chatbot in terms of price, usability, efficiency, and round-the-clock accessibility. (Kaur et al 2020; Patil and Kulkarni, 2019). The employment using a chatbot increases customer service effectiveness and reduces turnaround times by providing clients with quick answers and being

available around-the-clock (Kaur et al., 2020). Among the most inventive and captivating uses of Chat bots, a type of artificial intelligence, use pre-programmed customer queries to interact with people and offer courteous, timely problem-solving (Mogaji et al., 2021). Banks are using Chabot technology not just answers customer inquiries without the need for human involvement, but it also gathers information about client inquiries for use in resolving future issues (Huang and Lee, 2022).

An independent examination of the connections between Digital Payment System (DPS), Automation (AUTO), and Artificial Intelligence (AI) found a strong positive correlation among the three concepts. This outcome is in line with both Hypotheses 3a and 3b. Digital devices that swiftly and precisely count money are an illustration of AI technology's implementation in the banking industry without the need for human interaction (Rahman et al., 2022). In addition to lowering labour the mathematical count and stress concurrent cash counting error, this automated Support from technology boosts banks' daily business volume (Rodrigues et al., 2022). The banking industry's usage of automation systems has produced a favourable working environment for the technology's future adoption in practically all of the functional domains of financial institutions (Doumpos et al., 2022).

The results (hypotheses 4a and 4b) most significantly indicate that fraud detection (FRAUD) and the digital payment system (DPS) are significantly impacted by artificial intelligence (AI). Banks are more often targets of fraud due to the volume of business financial transactions and the complexity of their duties. Through the use of unsupervised learning, artificial intelligence (AI) uses complex algorithms and mathematical computation to monitor employee and customer behaviour. Programs (Verma, 2022; Mogaji and Nguyen, 2022). Thus, it can get easier to prevent fraud utilizing AI technologies. (Rahman et al., 2022). In the banking sector, artificial intelligence (AI) relies exclusively on machine learning programming to substitute human labour and avert any threats to the effectiveness of business operations. AI technology may be able to help banks combat financial crime. As a result, AI is needed for money laundering, credit card fraud detection, and fraud monitoring. AI is able to anticipate potentially suspicious behaviour in the future and determine and thwart These dishonest behaviours in actual time (Taha and Malebary, 2020). The massive volume of credit card purchases that make up the data set helps to train the algorithm. Based on these transactions, the credit card holder can then be categorized as having either used their card fraudulently or normally. Despite recent advancements in the use of AI to detect credit card fraud, there are still lucrative prospects for money laundering and terrorist funding (Tiwari and Saxena, 2021).

The findings of the independent investigation indicate a good link between the three constructs of Digital Payment System (DPS), Intelligent & Logical Decision Making (ILDM), and Artificial Intelligence (AI). This finding supports both Hypotheses 5a and 5b. As stated by (Nasr et al. 2020), six Data-driven investment decisions are aided by machine learning and artificial intelligence. Recently times, major participants in the market have been adopting more and more quantitative methodologies and innovative methods for analyzing large data. Additionally, as more data becomes available and more accessible, investors' ability to use data analysis to make better judgments would be impacted (Srinivas & Rajeshwar, 2020). By applying machine learning, the lending sector can realize significant operational and strategic efficiency. Several important firms are already adopting big data analytics and machine learning to speed up the loan process (Benamara et al., 2021). It can substitute more modern and inventive methods for outdated statistical-modelling approaches in the financial services sector overall. Numerous industries already using it, including retail and healthcare.

6. CONCLUSION

The banking industry is evolving faster than ever thanks to artificial intelligence (AI), which is spearheading a dramatic revolution in the sector. Numerous Applications of AI technologies include the banking industry in topics like operational effectiveness, analytics, customer service, and core banking. AI views banking not only through physical locations but as a modern universe. The emergence of new financial services offered by contemporary banks is fostering their growth. Technology is enhancing cost effectiveness, enabling more widespread integration of the banking system, and enabling small value transactions. The effective use of technology multiplies the expansion and the growth of banks. As a result, the development regarding artificial intelligence has attracted more customers. additionally aided in the growth of the banks. AI isn't limited to retail banking services in banking applications; it can be used by banks to improve customer satisfaction and facilitate seamless, round-the-clock client association.

Despite being the foundation of innovation, artificial intelligence has already had a big influence on the financial sector. Enhancing client services, methods for regulatory compliance, asset management, credit risk assessment, and criminal detection. These various departments have benefited from AI by using it to help with decision-making, process automation, and operational streamlining. In doing so, banks were able to increase productivity, cut expenses, improve customer satisfaction, and make better decisions.

Our financial systems are run by algorithms and technologies powered by AI. The financial industry is beginning to apply the technology in a variety of original, inventive, and astute ways. Artificial Intelligence is bringing consumer-facing technology to financial processes. Digital transactions and payments are crucial areas for the effective integration of AI services to improve customer satisfaction. notable individuals involved in the payment business, such as PayPal, Amazon, MasterCard, and Google, are utilizing autonomous, intelligent, quick, and safe payment processing methods to ensure client pleasure.

7. FUTURE PROSPECTS

Practitioners and marketers in the banking industry can benefit from the insights this research offers. We encourage banking professionals to think about improving their usage of AI in the credit scoring, analysis, and granting processes in order to decrease risk, save costs, and enhance customer experience. This will help with the deployment of AI-based decision-making. However, while doing so, we advise utilizing AI as a tool to enhance customer service for low-complexity jobs as well as internal processes, diverting staff members' attention from these to other business-impacting activities. Additionally, we advise utilizing AI as a tool for marketing segmentation to target clients for the best solutions.

We also proposed possible avenues for further research from the standpoints of topic and approach. From a methodological standpoint, researchers could investigate and validate different AI techniques in banking investigations. In light of this, two potential areas for Efficiency forecasting in connection to assessing financial stability and looking at non-financial hazards, such as taking risks, are areas of future research that have gotten relatively little attention in the academic literature thus far. Future research initiatives could also look into the impacts of governmental policies and managerial practices on bank risk-taking. Lastly, more AI approaches, such as machine learning, or novel combinations of AI techniques, may also be applied to banking study in the future.

8. LIMITATIONS

The main limitation the limited participation rate of experts in the survey or questionnaire in this study. The process of gathering and analyzing the data takes a while. from the respondents in the research. However, the deadline for this study limits the amount of data that may be analyzed. The second possible restriction is respondent mistake. When respondents enter information into the questionnaires, mistakes could happen. The questionnaires' questions, in contrast, were unambiguous and provided little room for interpretation. It's also possible that the employees misinterpreted the questionnaire.

Though AI undoubtedly has the capacity to transform the financial sector, but this does not imply that human labour will soon run out. Among the drawbacks of AI is its accuracy. As a result, humans must still verify AI choices at the very least. Fourth, putting AI into practice still comes at a great cost. Therefore, expecting AI to be deployed by a large number of organizations—especially those with limited financial resources—is impractical. Ultimately, firms face a big issue when it comes to educating their human resources to use these cutting-edge technologies.

REFERENCES

Adil, Mohd, Parthiban, Eden Samuel (2024). Seeing Through the Mystique Surrounding the Task-Technology-Organization Fit: A Mixed-Method Exploration of Consumers' Intention to Use Banking Conversational Agents. Retrieved From: https://aisel.aisnet.org/cais/vol55/iss1/17/

Andriansyah, Yuli, Aziz, Layla Abdel-Rahman (2023). The Role Artificial Intelligence in Modern Banking: An Exploration of AI-Driven Approaches for Enhanced Fraud Prevention, Risk Management, and Regulatory Compliance. Retrieved From: https://www.researchgate.net/publication/373489510_The_Role_Artificial_Intelligence_in_Modern_Banking_An_Exploration_of_AI-Driven_Approaches_for_Enhanced_Fraud_Prevention_Risk_Management_and_Regulatory_Compliance

Arjun, R, Suprabha, K R (2022). Innovation and Challenges of Blockchain in Banking: A Scientometric View. Retrieved From: https://core.ac.uk/download/523306230.pdf

Aßmann, Leon (2024). Neobanks, generation Z and the transformation of banking. Retrieved From: https://ciencia.ucp.pt/en/studentTheses/neobanks-generation-z-and-the-transformation-of-banking

Bedarkar, Madhura, Khatwani, Ritesh, Mishra, Mahima, Mistry, et al. (2023). Impact of Blockchain on Financial Technology Innovation in the Banking, Financial Services and Insurance (BFSI) Sector. Retrieved From: https://www.naturalspublishing.com/files/published/55292aug26bg77.pdf

Benamara, N. K., Keche, M., Wellington, M. & Munyaradzi, Z. (2021). Securing E-payment Systems by RFID and Deep Facial Biometry. In 2021 1st International Conference on Artificial Intelligence and Data Analytics (CAIDA) (pp. 151-157). IEEE. DOI: https://doi.org/10.1109/CAIDA51941.2021.9425175

Bhattacharya, Chandrima, Sinha, Manish (2022). The Role of Artificial Intelligence in Banking for Leveraging Customer Experience. DOI: https://doi.org/10.14453/aabfj.v16i5.07

Button, Mark, Gilmour, Paul, Hock, Branislav, Jain, et al. (2024). Scoping study on fraud centres: Ghana, India and Nigeria. Retrieved From: https://www.researchgate.net/publication/386618459_Scoping_Study_on_Fraud_Centres_Ghana_India_and_Nigeria

Chaudhary, Shashwat, Dewakar, Sneha, Kanika, Satsangi, Priya (2023). Emerging Technology in Business and Finance. DOI: http://dx.doi.org/10.55544/ijrah.3.2.16

Doumpos, M.; Zopounidis, C.; Gounopoulos, D.; Platanakis, E. and Zhang, W. (2022). Operational research and artificial intelligence methods in banking. Eur. J. Oper. Res., 306, 1–16. DOI: https://dx.doi.org/10.2139/ssrn.4085812

Dr. S. Rajarajeswari, K. Srinivasan (2021). Financial Technology in Indian Finance Market. Retrieved From: https://en.wikipedia.org/wiki/Financial_technology_in_India

Gupta, Sumeet, Prashar, Sanjeev, Radhakrishnan, Jayanthi (2022). Understanding Organizations' Artificial Intelligence Journey: A Qualitative Approach. Retrieved From: https://aisel.aisnet.org/pajais/vol14/iss6/2/

Heidinger, D. & Gatzert, N. (2018). Awareness, determinants and value of reputation risk management: Empirical evidence from the banking and insurance industry. Journal of Banking & Finance, 91, 106–118. DOI: https://doi.org/10.1016/j.jbankfin.2018.04.004

Huang, S.Y. and Lee, C. J. (2022). Predicting continuance intention to fintech chatbot. Comput. Hum. Behav., 129, 107027.Innovations in Computer Science and Engineering, pp. 353-361. Springer, Singapore. DOI: https://doi.org/10.1016/j.chb.2021.107027

Kaur, N., Sahdev, S. L., Sharma, M. and Siddiqui, L. (2020). Banking 4.0: 'The Influence of Artificial Intelligence on the Banking Industry & How AI Is Changing the Face of Modern Day Banks'. Retrieved From: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3661469

Kak A et al., (2023). Health Consequences of Thymus Removal in Adults. DOI: https://doi.org/10.1056/nejmoa2302892

Kolari, J. W., López-Iturriaga, F. J., & Sanz, I. P. (2019). Predicting European bank stress tests: Survival of the fittest. Global Finance Journal, 39, 44–57. DOI: https://doi.org/10.1016/j.gfj.2018.01.015

Kshetri, Nir B., NC DOCKS at the University of North Carolina at Greensboro (2018). The Indian Blockchain Landscape: Regulations and Policy Measures. Retrieved From: https://libres.uncg.edu/ir/uncg/f/N_Kshetri_Indian_2018.pdf

Lamb J et al., (2013). Improving decision making in multidisciplinary tumor boards: prospective longitudinal evaluation of a multi component intervention for 1,421 patients. DOI: https://doi.org/10.1016/j.jamcollsurg.2013.04.035

Lamia H (2022). , "Assessment of Efficiency In Digital Economy Development In Tunisia: A Regional Analysis", International Journal of Social Sciences & Economic Environment, Vol. 7,Issue 1, 2022, pp 01–08. DOI: https://doi.org/10.53882/IJSSEE.2022.0701001

Lepetyuk, V., Maliar, L. & Maliar, S. (2020). When the US catches a cold, Canada sneezes: A lower-bound tale told by deep learning. Journal of Economic Dynamics and Control, 117, Article 103926. DOI: https://doi.org/10.1016/j.jedc.2020.103926

Mainetti L., Vergallo R. (2022). The role of technology in improving the Customer Experience in the banking sector: a systematic mapping study. DOI: https://doi.org/10.1109/ACCESS.2022.3218010

Mogaji, E. and Nguyen, N.P. (2022). Managers' understanding of artificial intelligence in relation to marketing financial services: Insights from a cross-country study. Int. J. Bank Mark., 40, 1272–1298. DOI: https://doi.org/10.1108/IJBM-09-2021-0440

Mogaji, E.; Balakrishnan, J.; Nwoba, A.C. and Nguyen, N.P. (2021). Emerging-market consumers' interactions with banking chatbots. Telemat. Inform. 65, 101711. DOI: https://doi.org/10.1016/j.tele.2021.101711

Nandi, Madhavi Latha (2019). Blockchain Technology Based Supply Chain Systems and Supply Chain Performance: A Resource-Based View. DOI: https://doi.org/10.1108/SCM-12-2019-0444

Nasr, M. H., Farrag, M. H. & Nasr, M. (2020). E-payment systems risks, opportunities, and challenges for improved results in e-business. International Journal of Intelligent Computing and Information Sciences, 20(1), 16-27. DOI: https://ijicis.journals.ekb.eg/article_106976_3b00d027096e3532f642549db287be35.pdf

Oral, B., Emekligil, E., Arslan, S., & Eryi ˇgit, G. (2020). Information extraction from text intensive and visually rich banking documents. Information Processing & Management, 57 (6), Article 102361. DOI: https://doi.org/10.1016/j.ipm.2020.102361

Patil, K. and Kulkarni, M. S. (2019). Artificial Intelligence in Financial Services: Customer Chatbot Advisor Adoption. International Journal of Innovative Technology and Exploring Engineering. DOI: https://doi.org/10.35940/ijitee.A4928.119119

Philip V. (2020), "The Effects of Digital revolution in Personal Traditional Banking", International Journal of Social Sciences & Economic Environment, Vol. 5,Issue 2, 2020, pp 12–19. DOI : https://doi.org/10.53882/IJSSEE.2020.0502002

Pichler, A., Poledna, S., & Thurner, S. (2020). Systemic risk-efficient asset allocations: Minimization of systemic risk as a network optimization problem. Journal of Financial Stability, 52, Article 100809. DOI: https://doi.org/10.1016/j.jfs.2020.100809

Rahman, M.; Ming, T.H.; Baigh, T.A. and Sarker, M. (2022). Adoption of artificial intelligence in banking services: An empirical analysis. Int.J. Emerg. Mark.; ahead-of-print. DOI: http://dx.doi.org/10.1108/IJOEM-06-2020-0724

Rodrigues, A.R.D.; Ferreira, F.A.; Teixeira, F.J. and Zopounidis, C. (2022). Artificial intelligence, digital transformation and cybersecurity in the banking sector: A multi-stakeholder cognition-driven framework. Res. Int. Bus. Finance., 60, 101616. DOI: https://doi.org/10.1016/j.ribaf.2022.101616

Saha, P., Bose, I. & Mahanti, A. (2016). A knowledge based scheme for risk assess-ment in loan processing by banks. Decision Support Systems, 84, 78–88. DOI: https://doi.org/10.1016/j.dss.2016.02.002

Sarbabidya, S. and Saha, T. (2020). Role of Chatbot in Customer Service: A Study from the Perspectives of the Banking Industry of Bangladesh. International Review of Business Research Papers 16, 1 (2020), 231–248. DOI: https://zantworldpress.com/wp-content/uploads/2020/03/13.-601-Tama-Saha.pdf

Sharma, Manoj (2023). A Study: How AI is incorporated in the Middle East Banking. DOI: https://doi.org/10.55544/jrasb.2.3.27

Srinivas, K. & Rajeshwar, J. (2020). Identifying User's Interest in Using E-Payment Systems. In Using E-Payment Systems.DOI: https://link.springer.com/chapter/10.1007/978-981-15-2043-3_40

Taha, A. A. and Malebary, S. J. (2020). An Intelligent Approach to Credit Card Fraud Detection Using an Optimized Light Gradient Boosting Machine. IEEE Access 8, 25579–25587. DOI: https://doi.org/10.1109/ACCESS.2020.2971354

Tiwari, A. K. and Saxena, D. (2021). Application of Artificial Intelligence in Indian Banks. 2021 International Conference on Computational Performance Evaluation, ComPE, 545–548. DOI: https://doi.org/10.1109/ComPE53109.2021.9751981

Tölö, E. (2020). Predicting systemic financial crises with recurrent neural networks. Journal of Financial Stability, 49, Article 100746. DOI: https://doi.org/10.1016/j.jfs.2020.100746

Verma, J. (2022). Application of machine learning for fraud detection—A decision support system in the insurance sector. In Big Data Analytics in the Insurance Market; Emerald Publishing Limited: Bingley, UK, pp. 251–262. DOI: http://dx.doi.org/10.1108/978-1-80262-637-720221014