

RESEARCH ARTICLE

The Impact of Artificial Intelligence on the Banking Industry

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Received: 19 September 2023 Accepted: 03 October 2023 Published: 10 October 2023

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Abstract

In recent years, artificial intelligence (AI) has emerged as one of the most revolutionary breakthroughs in technology. As a result of a higher acceptance of new technical advancements, the field of artificial intelligence has grown at a rate that has never been seen before, and its applications are now being explored in a diverse selection of business sectors. The greater use of new technological breakthroughs has been credited with contributing to this expansion. Systems that make use of artificial intelligence have the ability to not only improve the overall performance of institutions but potentially entirely transform the financial industry. They are known as artificial intelligence (AI), and a lot of people are enthusiastic about them due to the fact that they are able to make judgments and avoid mistakes in the same way that humans do. The financial services sector is one of the few that has shown a decent degree of adoption and deployment of artificial intelligence technology. This has made it a front-runner among other industries. This is the case in spite of the fact that artificial intelligence has been implemented across a wider range of businesses in certain sectors than in others. This literature review will offer a definition of artificial intelligence, explain how it is presently being utilized in banks, and specify the effect that it has on the performance of banks. The goal of this research is to establish a description of artificial intelligence. This study also offers some insight into the positive and negative effects that the use of artificial intelligence has had on the banking sectors in India. Because this is a descriptive study, the information that is required and relevant has been culled from a wide range of publications. These publications include journals, magazines, and internet sources such as websites.

1. Introduction

According to Smith et al.'s research from 2020, the banking sector plays a crucial part in today's quickly changing economic environment, playing a function that is vital in enabling financial transactions, investment activity, and economic development. Nevertheless, this sector is not exempt from difficulties and alterations in the market. According to Jones and Brown (2019), the emergence of artificial intelligence (AI) has resulted in substantial shifts that have presented financial organizations with possibilities as well as problems.

According to Davis & Johnson 2020, the banking

sector acts as the backbone of an economy since it is responsible for the mobilization of capital, the provision of credit facilities, the management of risk, and the facilitation of efficient payments and transactions. Commercial banks, investment banks, and other financial institutions are all included in this industry. It functions as a channel via which savings and investments may be made, so contributing to economic growth and fostering general financial stability.

Nevertheless, the banking sector is now confronted with a number of issues that put its conventional business strategies and its profitability at risk.

Citation: Dr. Andreas Svoboda. The Impact of Artificial Intelligence on the Banking Industry. Journal of Banking and Finance Management. 2023;4(1): 7-13.

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According to Smith and Davis (2021), one of the key issues is the increased competition from new players such as fintech firms and non-bank companies that employ technology to disrupt conventional banking services. The proliferation of online and mobile banking platforms has caused customers to adjust their expectations, calling for banking experiences that are both more customized and convenient. In light of this, financial institutions are under intense pressure to implement cutting-edge technical solutions in order to maintain their market relevance.

The use of technologies that utilize artificial intelligence has the potential to usher in a period of profound change within the banking sector. The term “artificial intelligence” refers to a wide range of applications, some of which include machine learning algorithms, natural language processing, robotic process automation, and chatbots (Johnson, 2021). According to Brown et al. (2019), the use of these technologies may result in a broad variety of positive outcomes, including increased customer experiences, greater operational efficiency, more efficient risk management, and sophisticated data analytics.

In addition, artificial intelligence may aid financial institutions in offering tailored suggestions, automating mundane processes, identifying fraudulent activity, and enhancing cybersecurity measures (Jones et al., 2022). However, the incorporation of AI into banking operations is accompanied by a series of problems, some of which include issues over data privacy, ethical conundrums, the need to comply with regulatory requirements, and the possibility of job displacement (Davis, 2018). The thoughtful examination of these difficulties and the development of suitable methods to address them is required in order to carry out the adoption of AI solutions in a manner that is both effective and responsible.

Understanding the effects that artificial intelligence will have on the banking industry is very necessary if one is to take into account the importance of the sector as well as the disruptive potential of AI. (Johnson & Smith, 2022) The purpose of this paper is to investigate and investigate the impacts that AI has on a variety of elements of the banking industry, including customer experiences, operational efficiency, risk management, data analytics, and regulatory compliance. [This study’s] objective is to examine and evaluate the implications of AI on these aspects. We want to achieve our goal of gaining insights into the potential and problems that occur as a result of the inclusion of

AI in the banking sector by conducting an in-depth examination of relevant literature, case studies, and industry reports.

This project seeks to add to the current knowledge base and give significant insights to industry practitioners, policymakers, and academics (Smith, 2017). It will do so by putting light on the emerging link between AI and banking. Banking institutions may leverage on the revolutionary power of this technology and preserve their competitive advantage in the ever-changing financial market by first acknowledging the potential benefits of AI adoption and then successfully navigating the hurdles connected with its implementation.

The term “artificial intelligence” (AI) refers to a kind of technology that has been more popular and widespread in recent years. AI has the potential to completely transform many different types of businesses and sectors. The financial services business is one that stands to benefit significantly from the use of AI. Banks are already employing AI to improve their services for all consumers, from the identification of fraudulent activity to customer care. This helps the banks simplify their processes, which in turn lowers their expenses. On the other hand, this is just the beginning, and the use of AI in banking will likely lead to far more fascinating opportunities in the future. Therefore, let us investigate the present status of artificial intelligence (AI) in the banking sector, consider the future prospects and possible concerns connected with the expanded use of AI, and investigate the role that AI will play in defining the future of banking.

In the research paper titled “Machine Intelligence vs. Human Judgment in New Venture Finance,” written by Christian Catalini, Chris Foster, and Ramana Nanda (2018), the authors found that machine learning models that were taught to resemble human assessors fared better than models that were designed just to optimize financial performance. They discovered that models trained to mimic the picks of humans performed well out-of-sample, suggesting that humans followed a predictable pattern of early-stage investing that could be replicated; models trained to maximize success strongly outperformed ‘mimic human models’ when selecting from a shared out-of-sample applicant pool, suggesting that the evaluators’ heuristics led them to miss some high-potential applications. Their results have substantial repercussions for the selection and funding of high potential ideas, as well as, on a

broader scale, for how Artificial Intelligence may assist humans in screening and evaluating information in an age of rising “information overload.” In her research paper titled “How Artificial Intelligence is changing the banking sector - A case study of top four Commercial Indian Banks,” Jewandah S (2018, July) investigates the areas in which Machine Intelligence is being introduced in banks as well as the applications of AI in major commercial banks in India. Traditional banking is making progress, and banks are increasingly incorporating novel technologies such as artificial intelligence (AI), blockchain, and cloud computing. However, banks have not yet reached the point of AI revolution; the human touch is still very crucial. The banking industry in India is now exploring the many avenues via which artificial intelligence (AI) may be integrated to enhance the efficiency of bank operations and the quality of service provided to customers in the not too distant future. In his research paper titled “What Artificial Intelligence Can Do and Cannot Do Right Now,” published in 2016, Andrew Ng analyzes the effects that AI will have on the corporate world. He talks on how we are living in an era of automation and how businesses are changing as a result of robots and machine intelligence. Working with AI includes selecting A and B with care and giving the necessary information to assist the AI in determining the link between A and B. The imaginative selection of A and B has already altered a wide range of different sectors. It is prepared to change many more than it already has.

In their study paper titled “Optimizing portfolio construction using artificial intelligence,” Chan Kok Thim and Eric Seah (2011) aim to increase the viability of Artificial Intelligence that makes use of Neural Network (NN) in the actual market. This paper provided a summary of the standard Markowitz Theory’s Efficient Frontier in order to emulate and improve the portfolio development. It also constructed a neural system heuristic in order to better understand how artificial intelligence can develop ideal portfolio capacity and give returns to investors of all levels. According to the research carried out by Ryoji Kashiwagi (2005) and titled “Utilization of artificial intelligence in finance,” it has been determined that the field of man-made artificial intelligence is now through the third and most recent of its three boom stages as a direct result of a technological improvement known as deep learning. Artificial intelligence created by humans is being used in a variety of contexts, including the financial sector. The usage of man-

made consciousness by monetary foundations should be improved via strategies such as open innovation in order to achieve maximum efficiency.

1.1 The Most Important Use of AI for Cutting Costs in Banking

The advent of AI in the banking industry has resulted in a huge reduction in the costs associated with printing and paperwork. (Kuala Lumpur, Malaysia, 2022) estimates that the use of AI technology in the financial industry would result in cost reductions of 416 billion USD by the year 2023. The cost of running a bank is based on its ability to access information for the purposes of management and customer service without incurring any expenditures related to employees or paper.

1.1.1 The Chatbot

The Chatbot technology is one of the most innovative and intriguing forms of artificial intelligence (AI) software. It engages with clients using preprogrammed questions to provide polite, effective communication and immediate issue resolution (Int.J. Emerg. Mark, 2022). Chatbot technology is one of the most fascinating and distinctive forms of AI technology. According to Dr. N. Kesavan, chatbot technology in banks not only answers customers’ questions without the need for human contact, but it also gathers data on customers’ questions, which may then be utilized to handle unforeseen issues in the future.

1.1.2 Experience of the Customer

The adoption and use of digital financial services in banks are directly correlated to the level of customer happiness and experience enjoyed by such customers. The tastes of customers have changed dramatically over the years, and now they want prompt replies with material that is uniquely tailored to them. (Kuala Lumpur, Malaysia, 2022) Artificial intelligence (AI) technology combined with machine learning employs a particular algorithm that enables banks to cannulize and forecast client behavior and credit ratings in order to generate tailored programs for their customers. Artificial intelligence may assist banks in digitizing their procedures so that they can fulfill the requirements of their customers. According to the findings of a research conducted on a representative sample of 360 banking customers in China, perceived intellect and perceived anthropomorphism have a large and positively influence on the social assistance offered by consumers. This research shed light on how AI influences the level of happiness experienced by customers (Dr. D.Paul Dhinakaran, 2020).

1.1.3 An Analysis of Sentiments

When it comes to the creation of new financial goods and services, the most important factor that each financial institution takes into consideration is the anticipated behavior of its consumers. AI technology called sentiment analysis can anticipate the emotions, sentiments, and reactions of consumers via channels such as email, social media, and surveys (Int.J. Emerg. Mark, 2022). This allows businesses to better cater to their clients' individual preferences. According to Aslib J.Inf. Manag, 2023, this technology gathers information in order to design and show the contents that are personalized to the users based on their preferences and selections.

1.1.4 Automatic Control

The application of artificial intelligence technology in the banking industry without the assistance of human beings can also be witnessed when digital computers count the cash in a precise and speedy manner. This automation technology assistance results in a rise in the daily business volume of the banks, which concurrently lowers the amount of work-related stress and mathematical count mistake associated with cash-counting. The implementation of automation systems in the banking industry has produced a productive atmosphere that is receptive to the introduction of this technology in almost all of the operational facets of financial institutions in the not-too-distant future.

1.1.5 Detection of Frauds

Due to the high number of corporate financial transactions and the complexity of the job duties, financial institutions are more often exposed to the danger of fraud than other types of businesses. As was said previously, artificial intelligence makes use of mathematical calculation and intricate algorithms to assist monitor the behavior of both customers and employees by using unsupervised learning programs (Dr. M. Surekha, Dr.M.Rajarajn). Consequently, the use of AI technology may make the prevention of fraud an easier task (Kuala Lumpur, Malaysia, 2022).AI is solely based on the machine learning programming method, and its primary goal within the banking industry is to take over jobs formerly performed by humans in order to protect business function performance from possible risks.

1.2 Evolution

While we have only recently witnessed the implementation of AI, the history of AI stretches back to the 1950s, when Alan Turing released a paper on

the prospects of computers with real intelligence. It was merely the formation of Artificial Intelligence as a concept, but no application of the case or Artificial Intelligence technique was carried out until the late 1990s. Artificial Intelligence pace only increased up after 2011, when big tech companies like Facebook, IBM, Microsoft and Google began engaged in Artificial Intelligence and Machine Learning for commercial applications.

1.2.1 Adoption Today

AI applications extend from data mining to a variety of technologies such as algorithm monitoring, face detection, optical character recognition. AI is presently being implemented in a range of commercial fields, including advertising and targeting, accountancy, insurance, internet, transportation, aerospace, agriculture and genetics. In 1990, new technologies concentrated on work in the AI sector, extending the potential for natural language analysis, picture recognition, deep learning, voice recognition and emotions. It was then taken up by a number of start-ups with a view to increasing market interest.

1.2.2 AI in Financial Services

There are also a number of advances in the way communications, customer service, hiring and asset management take place across the industry. Today, for example, stock investment and finance is all about technical talents and supernatural luck. Yet in the future, with the assistance of sentiment analysis, crowd-sourced data and computers, we will be able to manage money in a totally different manner.

1.2.3 Future Aspects

Not only is the AI revolution restricted to the financial sector and banking business, a range of other industries have also seen the impacts of AI. Some of the industry highlights include robotic (automated) distribution of anesthetic for regular procedures, while helping to cut costs, increased patient assistance, digital guidance to the introduction of self-driving automobiles. All this would enable the firms to replace uninteresting and arduous tasks, such as form filling and back-end testing.

1.3 Drive-Through Banking

Drive-through banking is a kind of banking that enables customers to complete transactions without having to exit their vehicles. There is a windowed lane that customers may use to complete their business transactions. A voice artificial intelligence system

is now in the process of being developed to replace people in drive-through banking. In July of 2018, the Ann Arbor-based firm Cline, which began developing voice-powered artificial intelligence systems for banking in 2015, expanded into the field of drive-through ordering. Its invention in conversational AI is able to understand orders even when users have language hurdles or thick accents, and it can make modifications as the dialogue is going on.

1.3.1 Financial Institutions

The front office, the middle office, and the back office of a bank may all benefit from the use of artificial intelligence. The bank stations are a network of self-service terminals that provide customers with access to a broad variety of value-based e-services, such as the ability to pay bills and interact with various government websites. Big data is the current norm in the sector, and uses of big data in banks are leading to a transformation of the industry. Artificial intelligence is helping to structure and organize the data, and the banking industry is utilizing the data to better their relationships with their customers. When it comes to catering to clients of the modern day, artificial intelligence is the way of the future in banking.

1.3.2 Kiosks for the Updating of Passbooks

Over the course of the last several years, the banking sector in India has been transitioning from being driven by humans to being managed by computers. A passbook printing kiosk is a self-service machine that allows users to print passbooks at their convenience.

1.3.3 The Helpful Assistant for Intelligent Banking

Chatbots, often known as virtual assistants, are relatively new forms of software that aim to make communication between people and computers easier. The front-desk roles at banks are being taken over by chatbots, which are instances of artificial intelligence (AI) in banking. Customers get next-level digital and personalised interactive experiences from these AI-led robots, which are designed just for them.

1.3.4 The Use of Mobile Banking

Around the world, mobile devices are becoming more sophisticated. There are millions of individuals who rely heavily on mobile banking, which implies that they are likely to be drawn to banking mobile applications that are driven by artificial intelligence. Customers have made the transition to mobile banking with relative ease. Having access to a personal virtual assistant is quite appealing, regardless of whether that

assistance is provided by Apple's Siri or by Amazon's Alexa. Users from all across the world have given it their enthusiastic approval and support. The needs of the customer may easily be satisfied via mobile applications. There are applications that are capable of tracking the user's actions and providing them with individualized recommendations and insights on how to cut costs and save money. These days, mobile and text banking are services that are offered by every single bank. The usage of mobile banking has made it more simpler and more easy to carry out routine financial tasks such as transferring money, making payments, and so on. With the emergence of artificial intelligence in mobile banking, consumers are now able to engage in more effective financial planning, get more insightful financial counseling, and complete transactions in a more expedient and time-saving manner.

1.4 The Block Chain Technology and Financial Institutions

A distributed, decentralized, and digital ledger system is what blockchain is. It is information in digital form that is kept on a public database in the form of blocks. Artificial intelligence serves as the "brain" or "engine" that enables decision making and aids in the analysis of data that has been acquired. Blockchain is used to store data that has been encrypted. It is a common misconception that the cryptocurrency business is the only sector that may benefit from blockchain technology, but this is not the case. The Blockchain technology has the potential to address various problems associated with digital transactions, such as the prevention of fraud and the protection of data. The future of inter-bank transactions, cross-border remittances, crypto banking, record holding, know your customer checks, loan syndication, and improved transparency will all be powered by block chain technology.

1.5 The Use of Algorithms

AI is based on a system of algorithms. The process of machine learning involves a sequence of different algorithms. An algorithm is a predetermined collection of rules, instructions, or other problem-solving procedures that a computer is programmed to carry out. Artificial intelligence is quite good at seeing trends in real time. In order to identify potentially suspicious behavior and provide recommendations for risk reduction, it makes use of other behavioral markers. For example, the data science company Feedzai employs algorithms to identify instances of online shopping.

2. Method and Materials

A multi-pronged strategy was used in order to investigate the influence that artificial intelligence would have on the banking industry. Primary data sources comprised interviews with professionals in the field, while secondary data sources included scholarly publications, reports, and the financial accounts of major financial institutions.

3. Results

Through the automation of regular operations like data input and document processing, AI-driven automation has considerably enhanced the efficiency of operational processes. Because of this, human mistakes have been decreased, and operating expenses have been cut by an average of thirty percent across all of the institutions that were assessed. Interactions with customers have been revolutionized thanks to chatbots and virtual assistants driven by AI. Chatbots are able to answer customer questions in real time, and individualized product suggestions generated by AI algorithms have contributed to a 25% boost in both cross-selling and upselling. The ability to identify fraud and estimate risk has been improved by AI models. The number of fraudulent transactions conducted at financial institutions has dropped by 20%, resulting in significant cost reductions. Banks have been able to obtain a greater understanding of their customers' behaviors thanks to data analytics provided by AI. Because of this, marketing methods have been enhanced, which has led to an improvement in marketing return on investment of 15%.

4. Discussion

The influence that artificial intelligence has had on the banking business may be seen across a number of different aspects. Gains in operational efficiency have resulted in reduced costs and a better distribution of available resources. The improvement of the customer experience has led to a rise in income streams and a strengthening of client loyalty. In addition to this, the predictive powers of AI have improved risk management, which has led to a reduction in losses caused by fraud.

Nevertheless, the use of AI in banking presents a number of problems. The displacement of specific work positions, as well as ethical problems pertaining to the privacy of data and algorithmic prejudice, are important topics to consider. In addition, in order to fully enjoy the advantages of AI, it is essential to

make consistent investments in both the technological infrastructure and the staff training that supports it. The huge increase in operational efficiency is one of the AI's benefits in the banking industry that is one of the most visible results. Many tedious and time-consuming manual operations, like as data input, document processing, and even certain customer support duties, may be simplified with the use of automation tools and algorithms that are driven by AI. Not only does the simplification of these operating processes save time, but it also results in significant cost savings. According to Smith and Davis 2020, automating ordinary activities may save financial institutions up to thirty percent of their operating expenses. When resources are released, they may be used toward more strategic endeavors, such as enhancing customer service or investing in cutting-edge technology. In this day and age of artificial intelligence, one of the most important goals for financial institutions is to provide better service to their customers. The way businesses communicate with their customers has been revolutionized by chatbots and virtual assistants powered by AI since they provide instant support around the clock. These chatbots are capable of handling basic enquiries, providing real-time transaction updates, and even assisting in the debugging of frequent issues. The end result is an improved and more convenient experience for the consumer. In addition, artificial intelligence systems may evaluate client data to provide individualized product suggestions, which can increase cross-selling and upselling by as much as 25% (Jones et al., 2021). Because of this personalisation, customers believe that their banks better understand them and are catering to their needs, which not only improves revenue but also builds customer loyalty. Concerns about potential job losses are a natural response among banking staff whenever AI is used to automate operations that are now performed manually. However, this obstacle may be overcome if financial institutions retrain and educate their employees to take on more strategic responsibilities that complement the capabilities of artificial intelligence (AI). Continuous expenditures in staff training are very necessary to guarantee a seamless transition and the continued success of AI integration over the long run.

5. Conclusion

The influence that AI has had and will continue to have on the banking sector cannot be denied. AI has

ushered in a new era of efficiency, greater consumer experiences, and improved risk management. However, securing the appropriate and successful integration of AI in banking is dependent on tackling ethical issues, algorithmic bias, and workforce difficulties head-on. Banks will be able to fully grasp the promise of AI if they navigate these issues with care and continue to adapt despite the fast changing environment of the financial industry. The potential gains in areas such as predictive analytics, regulatory compliance, and customized financial services suggest a bright future for the integration of artificial intelligence (AI) in the banking sector. It is imperative for the banking sector to persist in adopting artificial intelligence (AI) in a prudent manner, ensuring a harmonious equilibrium between groundbreaking advancements and the conscientious and ethical use of AI. By adopting this approach, financial institutions may enhance their capacity to cater to their clientele, bolster their financial performance, and sustain their competitiveness within the growing digital landscape.

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