

# Banking Sector Transformation - Artificial Intelligence In The Modern Digital Era

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**ABSTRACT:** Artificial intelligence is not a new concept. It has been emerging over the years indifferent fields and sectors. The financial sector is one of them. Functions in banking such as lending, fraud detection, creditworthiness, trading and customer service have already started adopting AI to function. This paper aims at analyzing the impact of AI in the finance sector especially banking in India. Secondary data was used for this research study. The geographical limitation of this study is India and the time period is 2015-2020. Different sectors such as credit rating and lending, fraud detection, trading and customer service were researched upon. The AI is being used in big companies but has the scope to be used in all companies and sectors. It requires more training and huge investment to develop. This is the new future. There are other sectors AI can be implemented in such as Payments, Security, Risk assessment, Financial Advisory Services, Managing Finances, Predictive Analysis. It is the game-changer in the digital economy.

**KEYWORDS:** Artificial intelligence, Banking, Credit rating, Fraud detection

## I. INTRODUCTION TO AI

Artificial intelligence (AI) refers to the simulation of human intelligence in machines that are programmed to think like humans and mimic their actions. The term may also be applied to any machine that exhibits traits associated with a human mind such as learning and problem-solving (Jake Frankenfield, Investopedia, 2020).

### Financial Transformation To Fintech

Over the past few years, we have seen Artificial Intelligence grow rapidly. A lot of industries have started adopting AI in their sectors. One such industry is the finance industry. The finance sector has proven itself an early adopter of AI in comparison to other industries. As such, the applications of artificial intelligence and machine

learning in finance are myriad. Traders, wealth managers, insurers, and bankers are likely well aware of this in some form or another (Nowak, 2020). Although people are aware of what AI is they still don't know about its capabilities in the finance sector (Deloitte-UK, n.d.)

According to McKinsey Global Institute, applying AI technologies in banking could generate more than \$250 billion in value across the sector. There are more saving opportunities, so most of the companies are implementing AI and it will be growing faster in the next decades. AI will help financial services companies maximize resources, decrease risk, and generate more revenue, in trading, investing, banking, lending, and fraud detection vertices (Chui, Kamalnath, & McCarthy, 2020).

### IMPORTANCE OF FINTECH

One sector that has grown the fastest happens to be Fintech. Fintech, the word, is a combination of "financial technology". Fintech is used to describe new tech that seeks to improve and automate the delivery and use of financial services. At its core, fintech is utilized to help companies, business owners and consumers better manage their financial operations, processes, and lives by utilizing specialized software and algorithms that are used on computers and, increasingly, smartphones (Julia Kagan, 2019).

Recently AI has been used in the banking, trading, investment, lending, fraud detection, investment opportunity discovery and portfolio management sectors. Each sector has different advantages to using AI. Some advantages include recognizing patterns, anticipating future events, making sound decisions etc. All these sectors have great potential and scope for the usage of Artificial Intelligence (Dylan Azulay, 2019).

### AI APPLICATIONS IN THE BANKING SECTOR

**Trading:** With the help of AI, it has helped the finance industry to process data and create algorithms in trading. It is especially useful in quantitative trading. AI-powered services analyze large and complex data faster. Using AI, robot-advisers analyze millions of data points and execute trades at the optimal price, analysts forecast markets with greater accuracy and trading firms efficiently mitigate risk to provide for higher returns. Example: AI platform, Robo Advisor, Stock scanner (Nowak, 2020).

**Customer service:** Chatbots help banks serve customers more efficiently, even though they aren't advanced enough to handle support cases autonomously. Powered by natural language processing, bots can listen in on agents' calls, provide accurate answers quickly, and suggest best practice answers to improve sales effectiveness.

- **HDFC Bank:** HDFC Bank has developed an AI-based chatbot, "Eva", built by Bengaluru-based Senseforth AI Research. Since its launch in March this year, Eva (which stands for Electronic Virtual Assistant) has addressed over 2.7 million customer queries, interacted with over 530,000 unique users, and held 1.2 million conversations. Eva can assimilate knowledge from thousands of sources and provide simple answers in less than 0.4 seconds, the bank said. Within the first few days of its launch, Eva has answered more than 100,000 queries from thousands of customers from 17 countries across the globe (Baruah, 2020)
- **SBI:** SBI has launched SIA, an AI-powered chat assistant that addresses customer enquiries instantly and helps them with everyday banking tasks. SIA was developed by Payjo, a startup based in Silicon Valley and Bengaluru. According to Payjo, since its launch, the chatbot has responded to millions of queries from thousands of customers. "SIA is setup to handle nearly 10,000 enquiries per second or 864 million in a day. That is nearly 25% of the queries processed by Google every day," Payjo said in a statement (Baruah, 2020)
- **ICICI Bank:** ICICI Bank, India's second-largest private sector bank has deployed software robotics in over 200 business processes across various functions of the company. ICICI seems to be referring to what is often referred to as "robotic software" – a kind of software generally focused on automating office work.
- **AXIS Bank:** Axis Bank launched an AI & NLP (Natural Language Processing) enabled app, Conversational Banking, to help

consumers with financial and non-financial transactions, answer FAQs and get in touch with the bank to loan other products.

**Lending:** Machine Learning is a game-changing technology for lenders compliance and regulatory costs and helping with robust credit scoring and lending applications. Credit decision-makers can use AI in finance to achieve faster, more accurate risk assessment, using machine intelligence to factor in the character and capacity of applicants. Example: Zest AI.

**Fraud Detection:** With the help of AI, it helps to analyze data within seconds and efficiently detect complex patterns, otherwise it might be difficult for fraud analysts to detect fraud in banking. AI removes the time-consuming tasks and enables the fraud analysts to focus on critical cases, like when risk scores are at the peak. The work quality and efficiency of fraud analysts also get enhanced since their workload uses automated AI algorithms. This is why AI for fraud prevention is a preferred choice among large enterprises.

## OBJECTIVES OF THE STUDY

Our research objective is to study and examine the influence of AI on the modern world in the field of finance and how AI combined with financial information transformed the financial organizations. Also to observe and report whether financial companies are using artificial intelligence and what are the different purposes they are using. Furthermore to use artificial intelligence in fintech and help out with functions such as Fraud detection, Customer service, Credit rating and lending, Trading.

## II. REVIEW OF LITERATURE

According to Kunwar, study related to AI examines the influence on the modern world, especially in the field of financial sector. Application of artificial intelligence, its challenges, opportunities and its impact on jobs and function. This study found out that many financial sectors have been benefiting greatly by implementing different artificial intelligence applications. This research paper concludes that throughout the value chain in financial services whether it is processing, analytics or investing, there is going to be more and more technology that can get things done (Kunwar, 2019).

In addition, Artificial intelligence involves two basic ideas. First, it involves studying the thought processes of human beings. Secondly, it works to represent those processes mechanically.

The study focuses on how AI is used in the finance industry and also mentioned the loopholes and how dangerous it is and also aims at how it has changed the banking sector with complete analysis (Patel, 2018).

Artificial Intelligence has been developed as a concept to mimic the human brain as AI is able to investigate a huge number of problems with a holistic human approach. Important questions about information privacy and security are raised due to the increase of internet computing and complex distribution. In the banking industry, artificial intelligence techniques are implemented rapidly for a new range of applications. As per the research conducted by Soni describes implementation of AI in the banking sector to mitigate cyberattacks. Artificial intelligence is involved in various activities of the financial industry or banks (Soni, 2020).

It is seen that many banks and FinTech start-ups are investing in AI. Yet, there are a number of challenges arising from the use of AI which could undermine trust and confidence amongst consumers. This study focuses on the issue of bias and discrimination in banking, Robots and chatbots are sophisticated. It also stated that AI in the finance industry is described as the ubiquity of AI is clear. The researcher believes that banking in the next century will become more personalized, customer-centric and efficient with the use of AI and should control machines to deliver reliable and trustworthy financial services (Lui, A and Lamb, G, 2018).

According to the study, the AI, ML and deep learning (DL) taxonomy as well as their various applications in the financial services industry specifically discuss four ways in which AI is changing the financial services industry: fraud detection (how AI is used to keep criminal funds out of the financial system); banking chatbots; algorithmic trading and regulatory and policy aspects (Bonnie G. Buchanan, 2019).

Moreover, the customer satisfaction levels rise, since customers receive better service, the shorter response time and greater availability of services potentially, for a lower price. Also, given the cost savings, resulting from task automation, this may make it possible to offer certain services that were traditionally reserved for certain customers e.g. financial advice to a broader range of users. The above is an advantage to the users of AI applications, as it enables financial institutes to offer better and best e.g. Greater accuracy in detecting card fraud and grants access to financial services to certain customers who might otherwise

have been excluded. e.g. lending to customers with whom a bank had no previous relationship and on whom there is non-financial information. It may also provide substantial cost savings in areas, such as regulatory compliance, where recent developments are putting pressure on costs (Fernandez, 2019).

According to Sabharwal research it was observed whether the selected Indian Banks are using Artificial Intelligence based technological applications or not and if the banks are using AI based applications, then what are different the purposes for which they are using them the researchers conducted structured interviews of branch heads in Meerut (U.P.). According to the findings it was suggested that only a few private banks use AI and all the Indian Banks should use AI based technological applications to provide customized services and products to its customers as well as in Transaction Monitoring (Munish Sabharwal, 2014).

To sum up the review study, it has been studied that above research have not considered government involvement towards the development of AI in banking. Without any rules and regulations it may lead to reckless use of AI which in turn cause exploitation of customers for the banks profit. The cost involved for the implementation of AI has not been spoken of. AI is an expensive technology which needs high initial investment. The ROI is not known. There is no success guarantee or scope for this. Even then according to the Review of Literature that has been taken it can be seen that AI is very vast and has a lot of developmental scope. With the right use and industry it can accelerate its growth. That is the reason why some Indian Banks have already started adopting AI in their day to day workings. Different banks have been using AI in different sectors which in turn has contributed to trading, fraud detection, credit rating and customer service.

### III. METHODOLOGY

The research methodology adapted for this study was systematic and implemented according to specific objectives, which were described. Descriptive research is applied using the secondary data sources collected from different research papers, articles, journals and case studies. For this study, the authors have taken Indian Banking. The time series we have used is from 2014- 2020 growth and trends of AI in India. The paper is based on the different segments of banking such as: trading, lending, security, credit rating and fraud detection. Analysis of secondary sources has

helped them in studying the impact of artificial intelligence on the financial industry and how it has completely changed the way of working.

**AI IMPACT ON THE BANKING SECTOR FOR 2014-2020**

Artificial intelligence (AI) refers to the simulation of human intelligence in machines that are programmed to think like humans and mimic their actions. The term may also be applied to any machine that exhibits traits associated with a human mind such as learning and problem-solving (Jake Frankenfield, Investopedia, 2020).+ Artificial intelligence is not a new development; indeed the first academic studies date back to the 1950s. However, it has gained popularity recently, owing mainly to three factors: the growing volume of digital data available; increased data storage and computational processing capacity and its lower cost; and the progress made in the algorithms used. Thanks to these changes, better use can now be made of the capacities of artificial intelligence, and in consequence its use is growing significantly, not only in the financial sector but also in the economy overall (Fernandez, 2019).

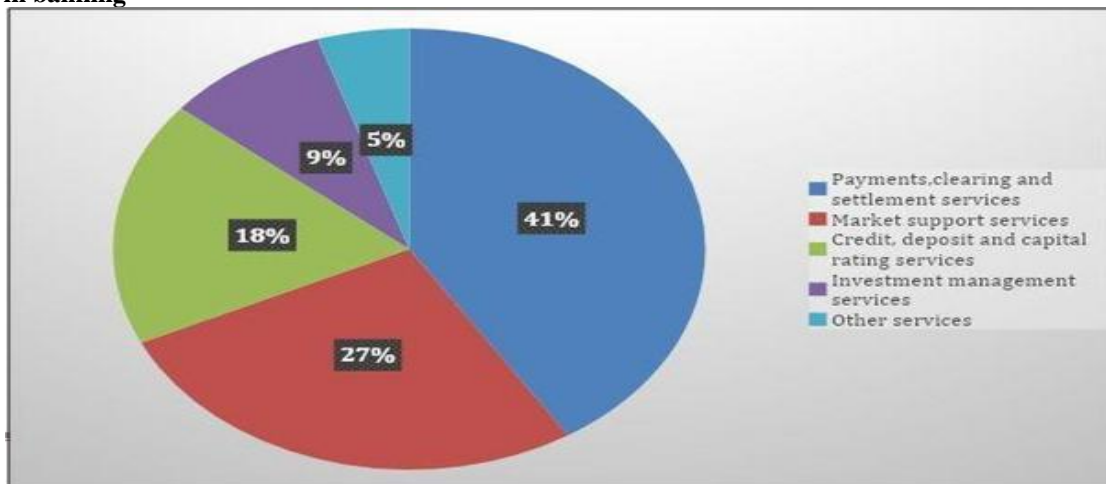
In the past few years AI has been transforming the financial industry in various ways. A lot of functions which needed human assistance are not now using artificial intelligence to do the same. Many sectors such as insurance, banking, lending, trading have already adapted artificial intelligence in their companies. AI is considered to be one of the fastest developing technology. Both machine learning and deep learning are disrupting the finance sector. It is user friendly, economical

and omni-present. In India a lot of banks have started using artificial intelligence. Some of these banks are ICICI, Axis, SBI and HDFC. The purpose of using artificial intelligence is for fraud detection, chatbots, trading ,credit rating and lending. Fraud detection is one of the major goals of using AI. With growth in online banking and transactions there is a greater threat of fraud. To combat this AI has been developed and is now being used. Another reason is for having chatbots that can enhance customer service. Credit rating and lending is a massive business in India which directly and indirectly touches almost all parts of the economy.

**Banking:**

Artificial Intelligence (AI) serves as a powerhouse for all emerging industries. At a time like this, the banking sector is trying its hand, leg and even head to give a head-start to AI developments. The financial services industry is appealing to enter the AI market to avail the luxury of accurate data and investment. Improvements help banks by providing better customer service, fraud detection, reducing administrative costs and making simpler decisions on AI analysis. Customers have expectations that can't be turned down. Expectations to get work done faster and with zero error. The only by-standing solution is the utilization of AI in the everyday banking sector. AI has the ability to keep the data private, give accurate answers and provide security for the customer's money. Indian banks are taking steps for to incorporate advanced AI technology into its daily banking system (Beatrice, 2020).

**AI in banking**



Source: (Varga, 2017)

In India, 12 banks such as ICICI, SBI,

Bank of Baroda, Axis, HDFC, Allahabad Bank,

Andhra Bank, Yes Bank, Canara Bank, Citi Bank, Punjab National Bank and IndusInd Bank are currently using AI for automatic cheque book reorder facility, signature verification, customer identification, conducting financial and non financial transactions, navigation, customer interaction. Bank of Baroda branch equipped with advanced gadgets like artificial intelligence robot named Baroda Brainy and Digital Lab with free Wi-Fi services (Munish Sabharwal, 2014). Even though banks in India have been adopting AI in their day to day functions. AI has still not developed at the pace that it should have. There is still a lot of scope for growth. There are a lot of banks that are still using traditional methods of working. They feel that AI is a costly technology and hard to use. With more banks using AI it will grow faster and will bring in more benefits making it cost efficient.

#### **Fraud Detection and Compliance:**

As customers conduct more banking online across a greater variety of channels and devices: greater variety of channels and devices, there are more opportunities for fraud to occur. Adding to the problem, fraudsters are becoming more creative and technologically savvy—they're also using advanced technologies like machine learning—and new schemes to defraud banks are evolving rapidly. Old methods for identifying fraud, such as using human-written rules engines, catch only a small percentage of fraud cases and produce a significantly high number of false positives. To improve probability predictions and identify a much higher percentage of actual cases of fraud while simultaneously reducing false alarms, banks need new forms of analytics. This includes using artificial intelligence (AI) ("Danske bank fights fraud with deep learning and AI," n.d.). AI plays an important role in fraud detection, given the serious threat of cyber attacks. As per the 2019 RBI annual report, losses due to banking frauds have risen by a whopping 73.8% despite the Government's efforts to curb them. What is even more shocking is that the banks have taken an average of 22 months between the fraudulent discovery and its discovery, according to RBI data. Considering RBI's zero-liability safety net in the event of cyber frauds, it is imperative banks adopt best-fit practices and technology levers to mitigate these risks. With adoption of real-time payments, there has also been rapid innovation in the digital fraud landscape (Balakrishna, 2020). AI is the new age solution to combat banking fraud detections. It is no longer possible to manually

detect frauds. AI bank business decision makers believe that it can add value and advantage to the business and future.

#### **Credit Rating and Lending:**

Big business lending in India directly and indirectly affects almost every sector of the economy. Since tens of millions of Indians with loans cost billions of dollars, any technology that could make even the slightest improvement in a company's recovery on their loans, or that could improve their market share, could cost a lot of money. That's why both established banks and startups in the industry are always looking for ways to innovate - and artificial intelligence can only allow that. In fact, AI future opportunities shows that about 15% of business support for AI vendors in the banking industry through solutions (Faggella, 2020). AI and Machine Learning (ML) provide a solution to this problem by analyzing forecasts, digital clues and other complex algorithms and data points. With most online transactions made via smartphone today, lenders can now easily track the activity of potential customers online. Instead of using credit score and credit history, fintech companies now use something called a "social loan quotient" to assess a loan applicant and determine his / her credit worthiness (ICICI Bank, 2020). The loan amount is tied to the collateral valuation (car, home, business, artwork etc). all these data sources together to create a consistent decision (Faggella, 2020). About 80% of Indians do not have credit ratings so AI can assist both bankers and lenders in determining credit worthiness. AI has business potential that can help banks. It can lead to faster loan repayment and help build a credit profile.

#### **Trading:**

AI shapes the future of stock trading. Using AI, robo advisors analyze millions of data points and make trading at a good price, analysts predict markets with greater accuracy and risk firms effectively reduce risk to provide higher returns (Thomas, 2019). Investment banks can use AI to process their customers' trading analysis. This can allow for faster trading, and some solutions may point to investment strategies that the customer may be considering. Additionally, this type of software can in some cases be able to do business in many markets. A trading solution like this may require a machine learning algorithm to match the buy / sell orders from traders to brokers, stocks, or other trading systems that can fulfill the order. Many electronic devices reduce sales and

increase retailer costs, but the algorithm can be improved over time to find the cheapest and safest way to do the job. (Mejia, 2019). Commercial AI has greatly benefited investment bank clients especially in asset management. AI also makes it easier for individual customers and improves stock trading in them.

#### Customer Service:

Despite its nascency, the Indian banking sector is beginning to adopt artificial intelligence (AI). While major commercial and investment banks around the world are integrating AI and blockchain into both backlash and customer care objectives, India, the widespread adoption of this technology has never been achieved. "The use of AI and ML in data analytics and customer service creates an opportunity for customized and faster customer experience, (Baruah, 2020). Depending on the customer service requests, the interviews appear to be an AI application of "hanging fruit" in the bank. However, business leaders in banks need to be aware that chatbot implementation is often only good for the arts (Bharadwaj, 2019). Customer service has been simplified with the use of AI. There is more customization, more common communication and faster response than in the past. AI also allows consumers to communicate and resolve customer queries 24/7.

#### IV. CHALLENGES AND ISSUES

The problem with today's Implementation of the First Warning Signs (EWS) by banks, was weak during the internal audit, the non-cooperation of borrowers during the audit, incomplete audit reports and lack of decision making in "Joint Lenders" (Basu, 2020).

All segments have their own pros and cons, banking also has its own challenges in adoption of latest and new technologies. The key challenges faced by banks are:

- 1) **Lack of reliable and quality data:** There is not enough data available with the bank and the available data may not be accurate. There is no honesty
- 2) **Multilingual set:** India is home to many languages. Each state has its own language which makes it difficult for banks to keep all information in one language.
- 3) **Lack of skilled developers:** There is no relevant AI knowledge or other specific course that makes technology possible for developers.
- 4) **Lack of people with proper data science skills:** AI is still young in India, data science skills are not yet fully developed. People find it difficult to work

with AI. There is a great need for data science skills but there is little availability.

5) **Lack of clarity of business objectives:** Banks are confident of what they really want to achieve. They don't know how they want to embrace AI in the bank.

6) **No clear internal identity testing technology emerges:** There is no clear idea about success rates or who is actually responsible for AI performance. If AI fails who is to blame ("How will artificial intelligence change the banking industry?," 2020).

#### V. DISCUSSION

Artificial intelligence is playing a significant role in helping humans in various ways to work with greater efficiency without human interference. Artificial intelligence has been used in various other fields like Agriculture and farming, health and medical care, Retail, Shopping and Fashion, security and surveillance, Inventory, production and manufacturing, sports analytics, warehousing and logistics, film making industries etc. As personal digital assistants like Siri and Bixby become the norm for consumers, technological revolutions are brewing across the world with companies and economies looking to leverage AI-related advancements to boost growth. In India, businesses like Swiggy and Zomato, which have invested heavily in AI over the past couple of years, have witnessed the power of technology to both sustain and increase growth -- and this has steered the discussion towards AI's potential ("AI for economic growth in India," n.d.). AI used by government of India: Some of the use cases that report highlights are facial recognition and hotspot analysis, biometric identification, criminal investigation, traffic and crowd management, wearables to empower women safety, optimising revenues in forest, cleaning river, tiger protection, digital agriculture, student progress monitoring and more (Thomas, 2020). In addition, the government officials do not have enough understanding about data and artificial intelligence. Technical knowledge and legal implications involve huge data, It is very important to protect the privacy of those data.

#### VI. CONCLUSION:

This paper concludes that there is a significant presence of AI in the Indian financial markets but there is still an untapped market and application which give scope of development and growth. AI is still in the introduction phase and is being used in very limited areas. The latest technology used in finance is fintech. AI is the new

age solution to combat banking fraud detections. It is no longer possible to manually detect frauds. AI bank business decision makers believe that it can add value and advantage to the business and future. AI has business potential that can help out banks. It can lead to faster processing of loans and helps in creating a credit profile. AI in trading has benefited significantly the investment banking clients especially in managing wealth. AI has also made it easier for the individual clients and to optimize stock trade for them. Customer service has been made easier with the use of AI. There is more personalization, regular interaction and faster response compared to before. AI also allows the consumers to communicate and solve customer queries 24/7. Artificial intelligence has brought a paradigm shift in the strategies of various financial firms globally. Now AI is used in a wide range of industries. Today, every organization is trying its best to use business intelligence. With proper training and investment AI can be implemented in other sectors such as Payments, Security, Risk assessment, Financial Advisory services, Managing Finances, Predictive Analysis. It is the game-changer in the digital economy. Results show that accuracy of artificial intelligence methods is superior to that of the traditional statistical methods used for dealing with financial problems.

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