The Impact of Artificial Intelligence For The Future of Banking Sector

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Abstract- *Artificial intelligence technology is rapidly evolving round the world. One among the primary adopters of AI is found within the Banking sector. Banks build and use technology in various ways. Intelligence in digital is getting stronger a day and smarter. Within the Indian banking sector, the benefits and rewards of the possible effects of the banking sector and various means of improving a depository financial institution are given to AI.*

Artificial Intelligence (AI) is the latest development in a series of technological revolutions .AI rapidly changes the dynamics of banking and financial services industry and also develops and evolves capabilities for AI in unexpected ways. It provides new opportunities and new challenges but also posses new risks. In addition to the ethical and impartial ethos of technology, and its resulting concerns like cyber crime and macro-financial dangers, a big question must be raised about its longevity, as it threatens to replace people and their individuality industry thriving on the art of customization and customer delight.

The moment paper endeavors to research moderately under-investigated point of view of AI supplanting people within the space of banking and money related administrations and obliviously proclaiming the trip of individual touch and administration customization which are the inspiration of consumer loyalty and show pride in enterprises like banking and monetary administrations known for his or her trustee and capable character.

Keywords- Artificial Intelligence, Banks, AI, Implementation, Banking sector, Technology, Customer satisfaction, Services.

I. INTRODUCTION

As a technological solution for businesses increasing worldwide to personalize their experience, Artificial Intelligence (AI) is revolutionizing. The technology itself is evolving and becoming smarter every day, allowing more and more new industries to implement AI for different applications. One of the first adopters of AI is becoming a banking sector. Banks develop and apply the technology in many ways. AI offers smarter customer service chat bots, user personalization services and even places an AI robot at banks for self-service. In addition to these important applications, banks may use the technology to improve their productivity and reduce frauds.

Artificial intelligence in banking is the most vital component of this sector. The machine learning within the banking system features a powerful impact because it communicates with people by making decisions and attracts its customers during a persuasive way. Its primary objective is to supply insight into customer's needs, confirm customers are pleased with the services provided by banking companies and enable customers to know their expectations from the banks.

The creation of AI could also be a collaborative project by many other scientific branches. AI features a variety of applications including expert systems, speech recognition and vision of computers, tongue processing, information assimilation, and thus the subsequent standard AI model: design, learning, thinking, problem solving, the representation of knowledge, perception, motion and manipulation, and to an honest lesser degree, social intelligence etc.

II. OBJECTIVES OF THE STUDY

To analyze the areas in which Banks make use of Artificial Intelligence.

- To research Artificial Intelligence technology in the Banking sector.
- To review customer service impact and the Banking sector customer experience.
- Thesis on Banking and finance risk management.
- Research the efficiency of Artificial banking technology to increase the performance of operations.

III. NEED FOR THE STUDY

The different studies so far have shown the global perspective on the adoption and application of AI in international banks and financial services sectors.

A research should be carried out to determine the applicability in the Indian banking sector of related models and strategies to the application of AI.

IV. SCOPE OF THE STUDY

The use of AI in the banking and financial industries has provided that the powerful tool for efficient risk management and effectively applying forecasting strategies and research methods on broad data are forming competent with the big data analysis.

The customer service system automation helps both the customer and the bank to communicate 24/7. In addition to the technology, it provides consumers with 24/7 connectivity to their accounts. The future is seen as the AI. A whopping 83 per cent of Indian bankers have confidence in its ability and expect that AI will be working with people in the coming years, according to the Accenture Banking Technology Vision 2018. Their analysis shows that AI will increase the Indian economy by nearly $1 trillion by 2035.In order to improve the way we finance, invest and insure, many businesses and industries are heavily investing in technology.

V. RESEARCH METHODOLOGY

In this research project I have tried to review secondary knowledge available as written literature such as books, blogs, journals, articles, etc. I have made observations and I addressed various problems, advantages, drawbacks in the use of artificial intelligence following various case studies on current AI implementation practices in banking sector.

LIMITATIONS OF THE STUDY

- The details have been only obtained from secondary sources; knowledge validity may not be completely accurate, the relevance of information may not be fully reliable.
- AI implementation would contribute to a substantial amount of unemployment in the banks and financial service sectors.

VI. REVIEW OF LITERATURE

Parsons, Gotlieb and Denny [1993] 1 in their study deals with the impact of IT on banking productivity per se. Computerization is one of the factors which improves the efficiency of the banking transactions. They concluded that higher performance levels have been achieved without corresponding increase in the number of employees. Also, it has been possible for Public Sector Banks and Old Private Banks to improve their productivity and efficiency by using IT

Healy & Palepu [2001] 3 in their study suggest that the use of technology can improve/enhance systems for administrative control such as enabling better management of risk, which if disclosed in regulatory reports to supervisors and in annual reports to investors, can improve bank transparency and enable the banks to reduce their cost of capital. Hence, technology can be the key to differentiation, competitive edge, and institutional survival

Rawani A M and M P Gupta [2002] 4 in their study empirically explore the differences in the role of IS among public, private, and foreign banks. Results indicate that while, at present, only private and foreign banks have obtained strategic advantages using IT, public sector banks, although late, have also realized the importance of IT. It has been empirically proved that the future impact of IS does not vary significantly with the banking groups. This suggests that IS efforts put in by the public sector banks are in the right direction and can be expected to give them a strategic advantage in future.

Hamid Eslami Nosratabadi, Ahmad Nadali, and Sanaz Pourdarab [2012]9 in their research paper for evaluating the credit degree of Bank's customers, have used of the combination of extracted rules of association rules by Data Mining Process and the knowledge of experts. They have classified the customers by the Association Rules after preparing and formatting the data. The obtained rules by the Bank's experts have been selected according to the importance. The designed Fuzzy Expert system is based on the rules of association rules and the defined Membership functions by the experts. This Fuzzy Expert system is used as the final predicting model for credit assessment of the bank's customers. One of the advantages of this model is the combination of the knowledge of the Bank’s experts and the rules extracted from association rules to the fuzzy expert system.

Rajanish Dass (IIM,Ahmedabad) [2012]10 Data mining can contribute to solving business problems in banking and finance by finding patterns, causalities, and correlations in

business information and market prices that are not immediately apparent to managers because the volume data is too large or is generated too quickly to screen by experts. The managers of the banks may go a step further to find the sequences, episodes and periodicity of the transaction behaviour of their customers which may help them in actually better segmenting, targeting, acquiring, retaining and maintaining a profitable customer base.

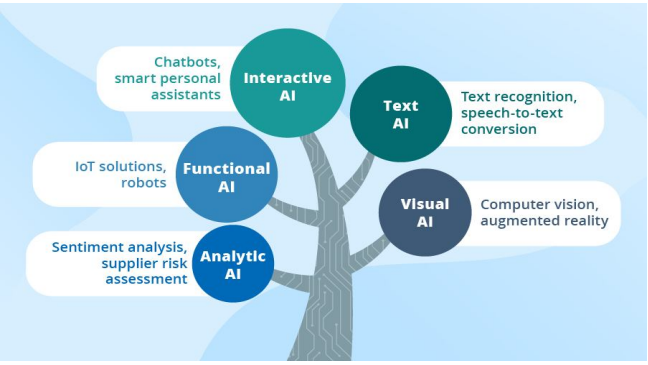
VII. ARTIFICIAL INTELLIGENCE IN BANKING

WHAT IS MEAN BY ARTIFICIAL INTELLIGENCE IN BANKS?

Banking is a community or network of financial services offering institutions that are responsible for the management of a payment system, loans, deposits and investment support. Banking history started in the early days when traders traveled all over the world exchanging their commodities for farmer's crops. With respect to India, there was evidence in the Vedic era of banking practices such as loans.

Modern banking was however born in India in the last ten years of the 18th century, when the first few banks were founded, namely Bank of Hindustan, Bank of India and Bank of Calcutta. The Bank of Calcutta was converted, while the others were liquidated, into one of the largest surviving and oldest banks and called as the State Bank of India.
If artificial intelligence systems in banks are enabled, they can effectively analyze the database and make it easier for banks to suggest, forecast and provide customer-specific financial advice. Via these applications, information on financial plans, loan rates and future business growth can be rapidly gathered. This smooth operation of the banking world by computers and networks can only be done by banks using artificial intelligence.

HOW MANY TYPES OF ARTIFICIAL INTELLIGENCE ARE THERE?



1. **Reactive machines**
2. **Limited memory**
3. **Theory of mind**
4. **Self-awareness**

THE IMPACT OF AI IN BANKS:

- As contrasted with the present, the only way to withdraw or deposit the money in the conventional banking system is to visit the closest bank, which has evolved a lot during a modern banking age in the mobile banking app.
- Such payment - based apps like Paytm, Google Pay, Phonepe, Freecharge, Amazon Pay, etc. can quickly perform smaller transactions...
- We cannot make bigger transactions, such as check deposits, loan deductions, bank balance statements, payments etc. In this case we will proceed with old practices such as long lines in banks, before we get our turn to solve the problem! We can't cope any more with this question.
- The introduction of programmed "ARTIFICIAL INTELLIGENCE" would help minimize these forms of bank errors and satisfy customers best-compliant with their customer service. This is one of the advantages for the future of Indian banking in time-management and successful working with better know-how in developing the banking industry.

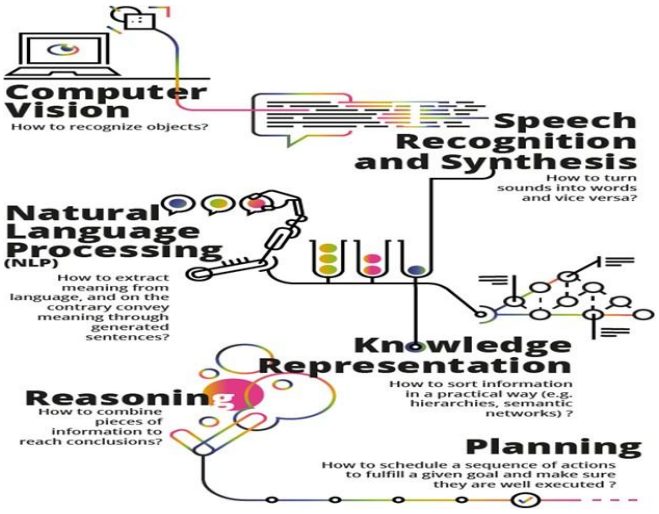


Fig. 1: Abilities of Artificial Intelligence

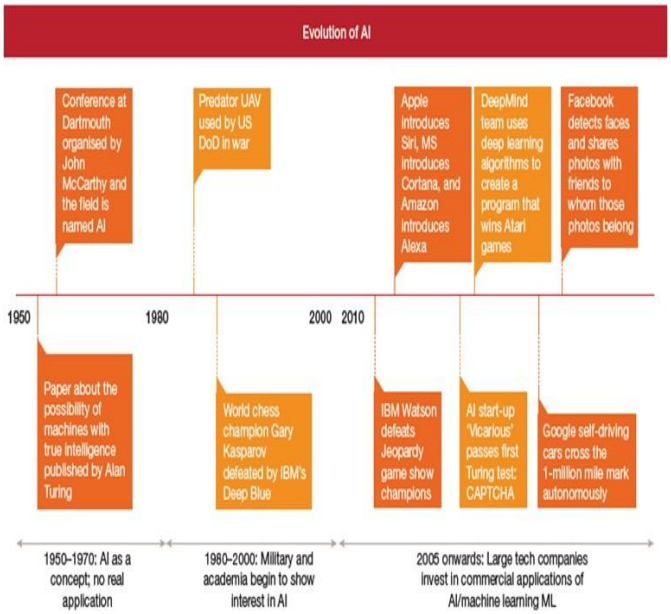


Fig. 2: Timeline evolution of Artificial Intelligence

BANKS HAVE BEEN ATTEMPTING TO USE ARTIFICIAL INTELLIGENCE:

- SBI has introduced SIA, an AI-chat assistant who, like a bank representative, can address customer inquiries instantly and support them in daily banking.
- HDFC Bank has developed an AI-based chatbot ,Eva (which has the Electronic Virtual Assistant stand) has been developing an AI- chatbot developed by Bangalore based meaning for AI research Since its launch in March of this year, more than 2.7 million customer queries were answered, interacted with over 530,000 unique users and conversations were held at 1,2 million.
- The second largest private sector bank in ICICI Bank, India, has introduced robotics software to cover various company functions in over 200 business processes.
- The third largest private sector bank in India, Axis Bank, unveiled last year's "Thought Factory" innovation lab to speed up the growth and growth of creative banking technology AI solutions.
- In collaboration with fintech start-ups, four leading commercial banks in India use AI to enhance customer service, reduce costs and increase productivity through chatbot.

APPLICATION OF AI IN FINANCIAL SERVICES:

Throughout the context of financial services, Artificial Intelligence plays a key role, where businesses use it in several ways, from data processing to virtual assistants. Speech recognition, face recognition and preparation are some of the other use cases in industries around the world, including problem resolution, reasoning, documenting, and manipulating data and objects. AI can be sensed by a number of sectors that are just a few applications of AI in banking, such as Healthcare, banking, finance, the government, army, gaming, defense, education, advertisement, investment and fintech.

Digitalization has basically reworked monetary services. Billions were collected from a flood of fintech corporations, exchange existing players with lower fees and efficient services. In the banking and different monetary services sectors, computer science is another part of transition. Through automating call taking or different back-office activities, robots will replace variant staff and create monetary firms slimmer and additional agile tech group's are pushed to seek out and stay prior to the competition new ways in which to spice up operations. Time unit and different divisions are forced to extend their experience and pass them to their customers.

- Personalized Financial Services
- Voice assisted banking
- Data-driven AI applications for lending decisions
- Digitalization instead of branch lines
- Smart wallets

COMPETITIVENESS-ENHANCING FEATURES OF THE AI BANKS:

- **Enhanced customer experience:** AI provides a deeper understanding of consumers and their attitudes on the basis of previous experiences. This enables businesses to tailor their financial products and services to provide real customer loyalty and create clear ties with their customers by incorporating customized functionality and intuitive experiences.
- **Future performance and trends prediction:** AI helps banks in predicting future outcomes and patterns with its

ability to forecast future conditions by evaluating past behaviors. This helps banks identify frauds, track money-washing trends and advice to customers. Current money launderers prove that the source of their illicit money is legal through a series of actions.

AI understands these occulted acts and helps save millions for banks, with its power of machine learning and cognition. AI is also able to identify suspicious patterns of data between humiliating volumes to handle fraud and risk. In addition, AI has researched past conduct of data points in its main recommendation engines, which lets banks sell and cross sell successfully.

- **Cognitive process automation:** This function allows a range of comprehensive, expensive and fault-prone banking services such as claim processing to be automated. This provides ROI, lowers costs and guarantees precise and fast service processing in every move. Cognitive process automation radically automates a variety of tasks by continuous machine learning that enhances their previous iterations.
- **Effective decision-making:** The systems like human experts think and react provide optimal solutions in real time based on available data. In the database called knowledge base, these systems maintain a repository of expert information. Bankers make strategic decisions using these cognitive systems.
- **Robotic automation of processes:** AI tests and processes using System Process Automation (RPA). This enables approximately 80 percent of repeat work processes to be automated, so that knowledge workers spend their time in value-added activities which require high human intervention.

EXAMPLES OF SOME FINANCIAL INSTITUTIONS IMPLEMENTED AI:

Technology is shaking up the historically changing-resistant banking industry, especially artificial intelligence. This is how AI enhances lending, customer service, identification of fraud and more.

AI influenced every "office" bank— front, center or reverse. That means you probably communicated with its AI-run customer service chatbook, at least, while you know little about the way your financial institution uses, say complex machinery to deter money launderers, or check mountains for fraud-related anomalies.

1. KASISTO

Industry: Conversational AI

Location: New York City, United States

How it's using AI: Digital-first banks — sometimes dubbed “challenger banks” or “neo-banks” — have been making headlines and in recent years they have attracted major investors in certain parts of the world, especially the UK. And still have to flourish in the States, as elsewhere, but Kasisto is one of the companies that have done most to midwife the growth.

The main contribution of Kasisto is its KAI platform for chatbots and virtual assistants that banks use for creating their own chatbots. This has its origins in the awareness and development of the AI, so that the Bank of America's Erica's other bank digital assistants answer complex financial management questions

2. AFFECTIVA

Industry: Artificial Intelligence, Software

Location: Waltham, Boston Massachusetts

How it's using AI: A humanoid chipper master style with a laptop attached to his chest is one of the world's most well known robots. First released in 2014, the MIT Offshoot Affectiva infused ‘Pepper’ with sophisticated emotional and cognitive reading ability just four years later. HSBC launched this upgrade on the bank floors, which included the flagship branch of HSBC in New York last year, on Fifth Avenue. It's been deployed since then at locations in Miami and Beverly Hills.

3. HOOYU

Industry: Software

Location: London

How it’s using AI: Biometrics has long ago achieved a degree in real-life security protocol from the world of sci-fi (think iris scanners by Blade Runner). Occasionally, one type is right in your pocket or bag with Mobile Fingerprint Sensors. Around the same time, biometrics such as facial recognition and voice recognition become increasingly intelligent as they converge with artificial intelligence, which rely on vast quantities of data for fine authentication.

4. SIMUDYNE

Industry: Investment Banking, Simulation

Location: London

How it's using AI: Automation has reached investment banking early–and hit hard. The best-known example is possibly this: 600 merchants were trading in US cash equity at the Goldman Sachs in 2000. There were only two in 2017. The outcome, though, wasn't as good as a change: the company has gained thousands of computer engineering workers.

Fraud Protection & Middle Office

While Artificial Intelligence in banking (at least compared with other services industry) has not radically redefined the customer-facing functions, it actually revolutionized what are known as middle-office functions. The middle office provides banks with risk control and security from bad actors. It involves detecting fraud, anti-money washing programs and verifying the identity of the client. And this also means that AI is used in legacy anti-fraud laws.

5. AYASDI

Industry: Artificial Intelligence, Fintech

Location: Palo Alto, California

How it's using AI: According to UN figures, up to two trillion dollars a year is washed, or five percent of global GDP. Taken together with the difficulty of the data and human involvement, the vast number of investigations makes it incredibly difficult to anti-money laundering (AML) research. It's expensive, too between 2015 and 2018, AML enforcement costs increased by more than 50%.

6. SOCURE

Industry: Artificial Intelligence, Fintech

Location: New York City, United States

How it's using AI: The whole business advice of "Know Your Client" is pretty sweet. It's federal statute too. The so-called KYC controls, developed in 2001 under the Patriot Act, include a range of identity checking provisions designed to combat anything ranging from terrorist funding to drug trafficking. These are often typically undertaken in combination with attempts to counter money-laundering.

7. DATAVISOR

Industry: Big Data, Machine Learning, Fraud Detection

Location: Mountain View, California

How it's using AI: Even though most banks implement fraud detection protocols, identity theft and fraud still cost American consumers billions of dollars each year.

While most banks implement protocols to prevent fraud, identity theft and fraud &errors are still cost effective under US consumers and figuring billions of dollars annually.

8. ZESTFINANCE

Industry: Artificial Intelligence, Big Data, Credit Underwriting

Location: Los Angeles, California

How it's using AI: Redlining, the unconstitutional denial of credit or home loans on account of race is one of the great shames in America after the war. However, lending practice is still influenced by biases, even though overt discrimination is not so evident, as if high-cost loans impacted minorities in the sub-prime mortgage crisis, famously and overwhelmingly. "[Credit] models are by definition very biased," said Douglas Merrill, former Google CIO, zestfinance CEO and Forbes. The illness is the tendency to make incomplete choices.

9. JPMORGAN CHASE

Industry: Investment Banking

Location: New York City

How it's using AI: If in recent years you have accepted, entered into or signed a work offer, or some other sort of contract, there is a strong chance that you used or are on your way to an online signing platform that implemented AI. (To help parties find buried risks hidden within the agreement, see DocuSign, perhaps the most ubiquitous provider that promotes its AI integration.)

10. FEEDZAI

Industry: Artificial Intelligence, Risk Assessment, Risk Management

Location: San Mateo, California

How it's using AI: The notion of waiting for a shopping to be "open" one day seems to be as ancient as an abacus in the era

of instant payment. Consumers increasingly expect their accounts to represent immediately after transactions. At the same time cyber criminals are actively working on discovering the newest and most successful way of gleaning the identity and personal details of another.

ADVANTAGES OF AI:

- AI allows error-free estimation and lower error chances than humans.
- Heavy, repetitive and boring activities are of extremely useful use in raising human efforts.
- It provides for various banking circumstances impressive forecasting research.
- Fraud detection is easy and disaster prevention is possible.
- It is easy to arrange and maintain documents and customer information and to document large amounts of transactional data.
- AI systems communicate with people and allow them to effectively and quickly solve problems with applications like natural language processing and voice recognition.
- Improved enforcement and standardization of legislation was achieved.
- No fear of fatigue, lastly.
- AI can use human intelligence without interruption, rest or sleep.

DIS-ADVANTAGES OF AI:

- Highly expensive.
- Robots still need humans for certain works.
- Technical challenges.
- Energy usage.
- Poverty (Unemployment).

VIII. CONCLUSION

In conclusion, I would like to suggest that the banking sector has a lot to sell. In the Indian banking industry, artificial intelligence transforms business processes and customer services this is also used to detect fraud and to assess person creditworthiness in compliance with regulations. Most banks have already undertaken initiatives to achieve the benefits of the operational AI from robotic process automation (RPA) to actual AI and machine learning deployments. Machine learning can offer enormous efficiencies when used properly. The use of AI will lead to more effective business processes, provide tailored services and contribute to wider objectives such as financial inclusion the recent move to digitization has undeniably rapidly influenced conventionally in banking models. This also exposed the organizations to growing threats and vulnerabilities to information security. The banks are looking ever more at emerging technologies like block chains and analytics in the development of a successful cyber-crime protection mechanism.

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