



A STUDY ON ARTIFICIAL INTELLIGENCE IN FINANCE SECTOR

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ABSTRACT

Artificial Intelligence (AI) is a major innovation in technology includes machine learning (ML) and algorithm language. It is popular not only in one field but many such as automobile, healthcare, Gaming, Robotics, Finance, Surveillance, Entertainment, Space Exploration, Agriculture, E-Commerce, and Social Media, etc. Its purpose is to develop an intelligent and autonomous system. Our study focuses on the applications of artificial intelligence in the field of finance sectors (banking, investment companies, insurance companies) with a brief introduction. The study explains challenges and their impacts with pros and cons in financial sectors. The study also reveals how artificial intelligence makes changes in financial industries in the future with few recommendations.

Keywords: Artificial Intelligence, BFSI, Fintech, Machine learning

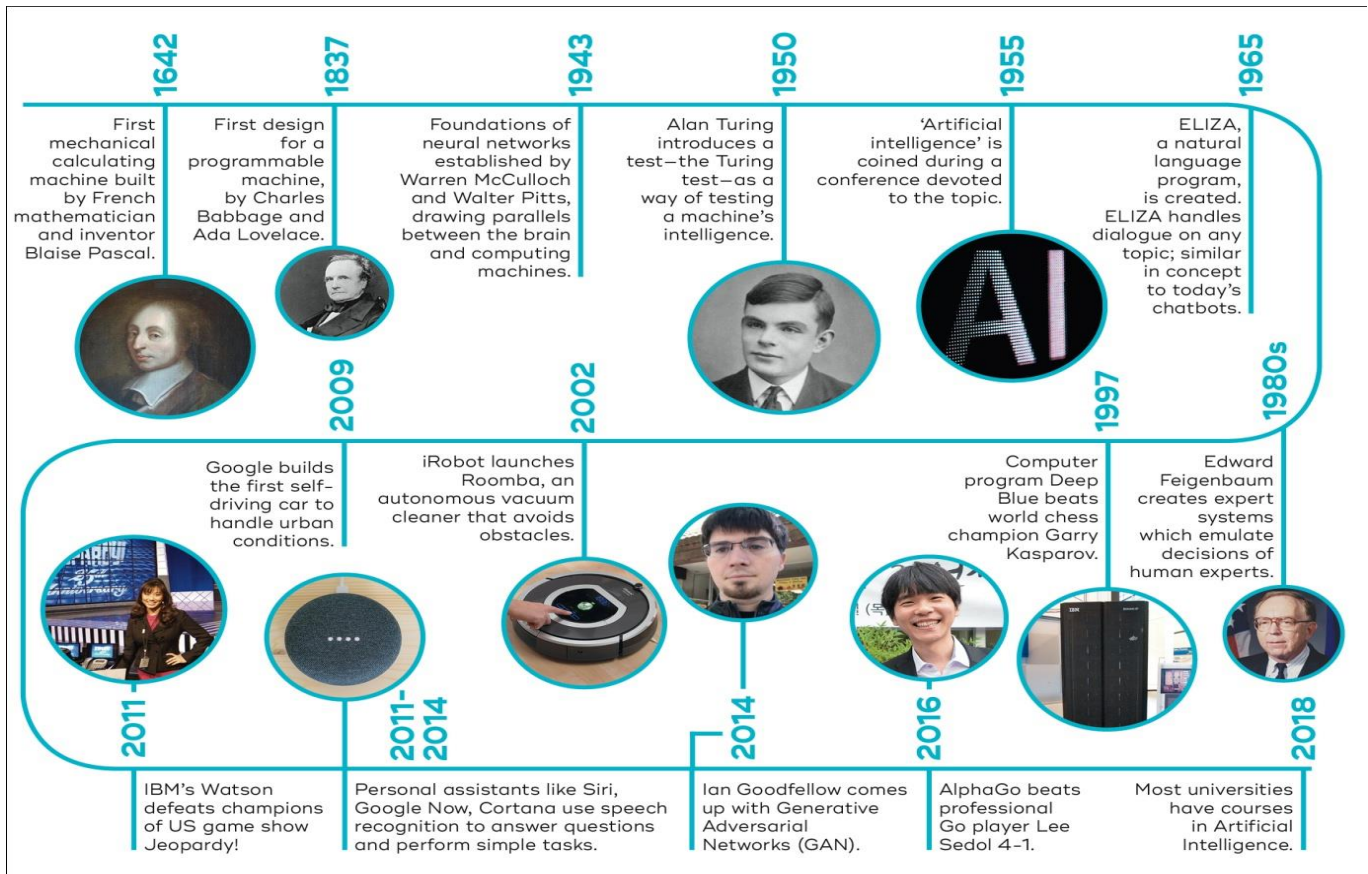
INTRODUCTION

BACKGROUND OF ARTIFICIAL INTELLIGENCE (AI):

In the current market, artificial intelligence becomes trendy in many areas. Artificial Intelligence (AI) is a major innovation in the technology that includes machine learning (ML) and algorithm language. AI could be described as the ability of machines (computers) to make an intelligent decision like human beings i.e. work out what to do – usually in the context of achieving a particular task.

Definition: According to John McCarthy (1955) defined “Artificial intelligence is making a machine behave in ways that would be called intelligent if a human were so behaving”. ML is a subset of AL that involves building models, mainly statistical models that give analytical results. In the finance sector, AI plays a significant role for future forecasting like investment in stock market investors apply various

methods of investment analysis and data mining in the amount of stock data to predict the market trend and maximize the profit. The stock market is highly affected by both market and non-market factors, so this machine learning plays a significant role in the "black box" model prediction for increasing the accuracy of market prediction. Similarly, regression algorithms and time series models in machine learning are used in the performance measure problem in establishing a prediction model, which could improve the accuracy of prediction and financial data analysis. A very brief history of AI as under:



Source: <https://qbi.uq.edu.au/brain/intelligent-machines/history-artificial-intelligence>

OBJECTIVES

1. To study the applications of artificial intelligence in the field of finance sectors with a brief introduction.
2. To study the challenges and impacts of AI in financial sectors with pros and cons.
3. To study the Future prospectus of AI in India with recommendations

SCOPE:

The study covers the area of AI in financial sectors like banking industries, investment companies, insurance companies, real estate firms, etc.

METHODOLOGY:

The study is based on secondary data and descriptive. The data collected from various journals, reports, and articles.

LIMITATIONS:

Our study is only based on AI in the field of Finance sector, there are many more applications of artificial intelligence such as Automobile, healthcare, Gaming, Robotics, Surveillance, Entertainment, Space Exploration, Agriculture, E-Commerce, Social Media on which further study can be done.

REVIEW OF LITERATURE

AS per Kunwar M (2019) present thesis on “**Artificial Intelligence in Finance**: Understanding how automation and machine learning is transforming the financial industry” examines the influence of artificial intelligence on the modern world, especially in the field of finance. The research concludes that throughout the value chain in financial services whether it is processing, analytics, or investing, there's going to be more and more technology that can get things done. **Development of Artificial Intelligence and Effects on Financial System** by Xie, M (2019) focused on the development and application of artificial intelligence and machine learning in the financial system, as well as its impacts on macroeconomics and microeconomics. Some suggestions and strategies were provided for reasonable usage of artificial intelligence in financial risk management, based on the financial risk management raised by artificial intelligence. The thesis on “**Artificial intelligence applications in corporate finance**” by Wallon (2019), focused on the usage of AI in corporate finance with the current usages and its prospects in a near future. It offered a viewpoint on this subject through information retrieved from papers, reports, and experts and an evolving survey using qualitative and quantitative analysis. It enables to get perfect views on the current situational analysis and the future expectations of AI in finance and, more precisely, in corporate finance. As per the article by Tom C.W. Lin, 2019 on “**Artificial Intelligence, Finance, And the Law**”, a study of those risks and limitations—the ways artificial intelligence and misunderstandings of it can harm and hinder law, finance, and society. It highlights the perils and pitfalls of artificial codes, data bias, virtual threats, and systemic risks relating to financial artificial intelligence. It also raises larger issues about the implications of financial artificial intelligence on financial cybersecurity, competition, and society soon. The research paper on “**Artificial Intelligence In Finance**” by Patel, K (2018) studying the thought processes of human beings. Also focus that AI deals with representing those processes via machines (like computers, robots, etc.). AI has now taken over many sectors including the financial sector.

APPLICATION OF ARTIFICIAL INTELLIGENCE IN FINANCE

- i. **Regulatory compliance – detection and prevention fraud:** With the increasing trend in e-commerce or online transaction the possibilities of fraud also increases exponentially. AI is based on the anti-fraud system which detects fraudulent activities, reports, and blocked such transactions. Banking and finance institutions have a Fraud Detection Software that patterns can be spotted by using predictive analytics without any knowledge to the human analysts and applying machine learning algorithms to detect the fraudulent transaction & minimizing fake decline.
- ii. **Prediction of Stock Market and Trading system:** Several issues can cause obstacles in the trading system. AI systems provide a faster analysis of data not only the cause of failure be known, but also provided the solution related to that. A Computer system has been trained to forecast when trade shares to maximize the returns & to reduce the losses during the uncertainties & help the investors, institutions, companies to take quick decisions.
- iii. **Increasing security:** In AI, Machine learning algorithms need a split minute to access fraudulent transactions in real-time not spot them after the crime is committed. Many of the organization are trying to implement the Artificial Intelligence to enhance the security in online transactions & related services.
- iv. **Risk Management:** Many organizations led to the subprime mortgage crisis due to a lack of risk management. Traditional software applications focused only on the selected loan application and financial reports. But new machine learning technology focused on every fact related to the current market trend to prevent financial crime and financial crisis prediction by its credit-scoring tasks in real life environment. It also helps to minimize underwriting risks. In the field of loan, health, mortgage, or life insurance, it can help handle every risk. It also fits perfectly with the underwriting tasks that are so common in finance and insurance.
- v. **Credit Card and Loan Decisions:** In process of credit card and loan decisions, AI automatically assessing the profile which reduces the cost and efforts involved significantly and making the whole process fair and transparent.
- vi. **Protect Client by Spending Pattern Prediction:** At present whole country is dependent on online transactions. In case if their card/Mobile is stolen or the account is hacked AI is useful for client spending detection to prevent fraud or theft. It identifies the user & allows the transaction to happen.
- vii. **Personalized Banking:** In banking, AI plays an important role to do all transactions online like payments, deposits where clients no need to rush banks. Even handle a majority of a client complaint and provide the clients with an efficient self-help interface. AI-based virtual supporters like Alexa, Google Assistant, Echo, etc. are already gaining popularity in the consumer markets. It presents true guidance to the prospective client and so that they can get accurate information and fast solutions to their problems.

- viii. **Process Automation:** Process automation is central to boosting one's productivity and minimizing operational costs by doing its job in just a few minutes. AI reduce more than 50% repetitive task perform by human and minimize cost. Process automation effectively interpreted documentation, identify issue need human attention by its services like call center automation, chatbox (Robots do chatting and give instruction), paperwork automation, etc.
- ix. **Security to World financial data** – Cyberattack and virus-like worms, Trojan are the main challenges in the modern era. Machine learning security solutions are capable of securing the world's financial data by providing the power of intelligent pattern analysis, combined with big data capabilities through security technology an edge over traditional and non-AI tools.
- x. **Marketing:** AI also shows its significance in finance domain people by predictive marketing analytics based on past behavior easily. It assists in accurately forecast sales by analyzing customer expectations. Web action can be properly supervised and cell phone app usage can be understood to discover trends and patterns.

CHALLENGES OF ARTIFICIAL INTELLIGENCE

As know AI is used in every field but have some challenges are there:

- i. **Difficult to understand** – Machine learning language is not easy to understand. It leads to some extent of risk and maximizes the level of governance. To reduce its complexities banks need to make clear about models and facts behind them in deep to their users so they can prevent from bad business decision
- ii. **Based on data availability and quality** - As we know that AI technology is based on big data. When sufficient and good quality of data uploaded then only it provides reliable information. Even in quality sources, biases can be hidden in the data. In the financial industry, the reconciliation of the data from front to back is already problematic, and data referential are often plagued with quality issues. Having a data-quality program in place is a prerequisite to any large-scale artificial intelligence initiative. Lack of this causes dangerous losses to the users.
- iii. **Responsibility** – Another main challenge in AI is if something goes wrong who will be liable for responsibility and accountability. The fact that there is no explanation as to why the algorithm provided a positive or negative answer to a specific question can be disturbing for a banker's rational mind. So it becomes necessary to keep a human supervisor to validate the machine's decisions for critical activities such as releasing/blocking payments or validating trades, partially defeating the purpose of using a machine in the first place.
- iv. **Fast changing technology:** As technology change rapidly each financial organization must look to move abstract concepts about AI from theory to practice so they can be used in daily operations. The right AI technology can automate labor-intensive manual processes, offer the level of performance needed to make use of the latest technologies, and mix with active systems and be reusable for other reasons.

- v. **Reliability of AI** – For security reasons Reliability of AI depends on its data and degree of control over the system. The slow but steady method of Test Driven Development which places assessment and verification to develop the required algorithm at its core is needed for a reliable system that can withstand the test of time.
- vi. **Lack of emotional intelligence:** AI is intelligent in solving various specific problems; detect fraudulent activities but lacks emotional intelligence. For instance, chatboxes are smart but lack empathy. They do what the program is loaded.
- vii. **Regulatory barriers** – Transparency in AI is important to succeed in the well-regulated world of financial services. The domain expert is required who can explain the reasoning and main context related to data. The capability of machine learning to communicate their reasoning will go a long way in crossing regulatory hurdles and gain acceptance from the users
- viii. **Tracking measure of success:** AI forecasting is based on the future prospectus, not provide a 100% guarantee whether your investment gives you profit or loss. It is a challenge to tracking measure of success like how ML positively impact on human behavior, how to reduce cost, how improved efficiencies. As AI grows the challenges in financial institutions too will vary.

IMPACT OF AI IN FINANCE SECTOR

AI provides huge benefits to a large number of concerns. Every factor has their positive and negative impact: Similarly AI also have some as under:

IMPACT OF AI IN FINANCE SECTOR	
PROS	CONS
Efficient in handling a large volume of information	Complex in nature need high production and maintenance cost
More efficient in forecasting assist business relationship strong and do advisory work as well	High-end fintech technology is too costly so each organization could not afford the premium application of AI
Eliminate bias from metrics	Due to rapid technology changes many experts issue warnings about the dangerous nature of AI
Better informative charts and graphs help to make a safe decision	Lack of regulatory scrutiny may present a problem in the upcoming period
Provide 24/7 hours service as compare to human resources.	Possibility of misuse of data cause serious losses like delivered to wrong hand can cause serious threats to humankind.
Quickly perform the task related to finance like Insurance, Trading, accounting, etc. Financial users get transaction records online and offline which saves time, money, and effort.	Wide-reaching unemployment as replaces workforce with machines and computers. Also, block the human mind and increase dependency on the machine.
Fraud detection is a smart card-based system with the use of AI.	Lack of creativity mind

FUTURE OF AI IN INDIA WITH SOME RECOMMENDATION

Today, the world is shifting towards artificial intelligence technology. Google, Amazon, Flipkart some tech giant has using AI to build predictive models of consumer behaviour. In the field of education, most universities have offered various coursework in AI. Bitcoin gets its popularity has made the use of AI in finance by providing robotic advisory services. Insurance companies already dominated to AI for big data which provide personalized recommendation replaces personal financial assistance. Huge investment is made by companies, firms, investors on basis of data of AI which saves their money and avoiding human errors. These BFSI (Banking, financial services & insurance) industries adopting AI-based fintech solutions at a very large scale.

The speed at which AL adopted by finance industry we can't deny saying that very soon this progressive steps replace human resource and provide quick and efficient solution to users and it is the future of Finance industry as below diagram shows:

Key fintech trends (Areas emerging as new norms in banking)



Source: Panorama by McKinsey

Source: Mckinsey

By 2035, there is the possibility that the use of AI increases massively in the Indian economy. Recently, the US and China are the top countries making the adoption of AI technology, India is in progressive ways but positively it opens the door for jobs approximately 2 lakh for AI experts and others in many sectors like education, healthcare, retail, etc. Right skilling is regarded as the crucial factor for achievement in technology adoption. In the year 2018, when the start-up scheme started it shows tremendous growth in the financial sectors. Recently, more than 400 startups working in AI and machine learning areas. Many start-up cities in India like Bangalore, Hyderabad, Mumbai, and New Delhi work on AI and deliver better customer services. A million of the amount is spent by private industry players in AI. In June 2018, NITI Aayog set the roadmap on how you can develop artificial intelligence in India. It is considered that Artificial Intelligence may help the nation to develop economic and social growth. Shortly, we can see AI is used to handling traffic problems, the health of roads, track blacklisted folks, biometry, etc. In a report on 17th May 2021, LG companies announce to invest more than \$100 million for the next three years to establish a massive high-performance computing infrastructure for Artificial intelligence development. LG establish top class computing infrastructure that can perform 95.7 quadrillion calculations per second. They believe that AI systems will be useful from customer counselling to production development. They

also plan to use AI solutions to the development of cancer treatment vaccines and environment-friendly plastics.

According to joint research conducted by the National Business Research Institute and Narrative Science more than 32% of financial services providers making use of AI technologies in voice recognition, government finance, audit, predictive analytics, etc. Some opinions of industrialist expert on AI are as under:

Rajeev Agarwal, CEO of payments platform accepts that AI is still in its growing stages of development and will require a strong digital backbone supported by high-quality data and a skilled workforce to fully draw the essence of the technology. Similarly, Rahul Sekar, cofounder, and CTO at Shubh Loans said “In a fast-changing environment, policies and processes need to be nimble and tailored to customer characteristics. It is not possible to provide the next-gen customer experience without AI,”

Gaurav Chopra, Founder & CEO, India Lends and Manish Patel, cofounder of Mswipe further agrees to the fact that Artificial Intelligence has the potential of becoming a significant facet in the future growth of the Fintech sector and AI can be a real game-changer in boosting the efficiency and accuracy of the financial services sector.

RECOMMENDATIONS

1. AI is used in every field and probability to reduce human job opportunities, need deep learning of AI. The business will achieve great success if the machine and human staff work together.
2. AI must be adopted according to the needs of sectors for that skilled managers are required.
3. AI needs specific talents, so students need to gain extraordinary training in learning and creating machine learning and algorithm language. Such courses should cheer up by universities and institutions.
4. Government support to encourage AI, so we are not backward by other countries in the field of technology

CONCLUSION:

Experts believed that AI soon becomes the part and parcel of human life. It completely changes the way we see our world. It solves many problems in minutes. There is a possibility that AI reduces human needs, so we need to balance by updating ourselves according to the changes. We must be kept in mind that we made machines, machines not made us. We get benefits by making its proper utilization.

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