



APPLICATIONS OF ARTIFICIAL INTELLIGENCE IN FINTECH COMPANIES

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Abstract:

The concept of Artificial intelligence is not so old but now it is used almost in all fields like medical (diagnosis and treatment), engineering, pharmaceutical (drug discovery and clinical trials), Banking (Keya: The Customer assistant), Financial (Keya: The Customer assistant), online shopping (Amazon and Flipkart) etc. The financial business might undergo a huge change if artificial intelligence (AI) and machine learning (ML) are effectively used. These tools have the potential to hasten the discovery of new methods, the prediction of their efficacy and the improvement of services to the customers. Data quality issues, ethical dilemmas, and possible biases are emphasised as obstacles. The financial industry may usher in a new age of quick services by overcoming these obstacles and utilising AI's strengths. Further studies will give answers to many questions and many other and useful applications of AI will introduced like the challenges of AI with pros and cons in financial sectors, the know how artificial intelligence will make changes in financial industries in the future, how can artificial intelligence (AI) be utilized in financial technology, to know the different Fintech Methods Based on Artificial Intelligence, to know different application of Fintech in the Modern Banking Industry, policy issues regarding competition, regulatory perimeters etc. and to analyze the AI technology regarding the potential applications, implications, and risks it may propagate in financial services.

INTRODUCTION

Artificial Intelligence

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.

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”. 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 [1].

Aim of Artificial intelligence (AI)

Artificial intelligence (AI) aims at "making intelligent machines". The concept of "AI-empowered" is gaining increasing popularity. Currently, key participants in modern finance are not entirely humans; instead, machines constitute a large proportion. They take over routine and structured tasks such as standardized analysis. Since AI can help business leaders automate time-consuming and labor-intensive operations, and it enables businesses to offer innovative services to customers, the application of AI in the fields of finance has attracted much attention and interest. The industry is evolving as organizations that were customarily financial institutions are mutating into information technology enterprises, and vice versa [2].

History of Artificial intelligence (AI)

The term "artificial intelligence" is a Dart organization organized by John McCarthy in 1956. The discussion meeting of the Mous summer research project proposed to explore where the machine can be the aspect simulates human intelligence. As early as the 18th century Thomas Bayes pointed out provides a framework for calculating the probability of management events, which was originally characterized by artificial intelligence technical ideas. In the 19th century, George Bull pointed out that logical reasoning can be the equations are executed systematically. At the beginning of the 20th century, the first electronic computing the advent of the robot marked the first generation of robots capable of sensing and acting autonomously. Alan Turing envisaged the construction of "Computer and Intelligence" in 1950. The possibility of building computers to simulate human intelligence, including how to test artificial intelligence ability, how the machine learns independently, etc. In the following decades, artificial intelligence the ups and downs, the problems that emerged in the research far exceeded expectations. In the late 1990s, people industrial intelligence research focuses on specific fields and applied research, and has entered an accelerated phase. Its China is particularly prominent in image recognition and medical diagnosis. In 1997, IBM fat Computer "Deep Blue" defeated the world chess champion Kasparov; Apple Siri, IBM answered the computer waston in answer to the game show to win; 2010 years later, from government, e-commerce, business, social media, science and government provides available big data and powerful computing capabilities, and the technology industry is increasing investment in the field of artificial intelligence, the above factors have promoted the wave of artificial intelligence development tide. At the same time, deep learning technology is developing rapidly. In the field of image recognition, human the error rate was 5%. The best result ofartificial intelligence in 2011 was 11%. It was reduced to 3.5% in 2015, and AlphaGo, a gaming technology, defeated humans go champion and so on.

The Future of Artificial Intelligence predicted in 2016

The National Science and Technology Commission's "Preparing for the Future of Artificial Intelligence" in 2016 pointed out that there is currently no universally accepted definition of artificial intelligence. Some people define artificial intelligence as a computerized system that can perform behaviors that

are generally considered to require intelligence; others define artificial intelligence as a system that can be reasonable regardless of the complex problems encountered Or take appropriate actions to achieve its goals. Although the definition of AI is not clear and changes over time, the research and application of AI always adhere to a core goal, even if human intelligent behaviour is automated or copied. The US Office of the President's Administration pointed out in the "Artificial Intelligence, Automation, and Economic Report" in 2016 that AI is not a single technology, but a collection of technologies applied to specific tasks. In 2017, the strong artificial intelligence defined by "Science" refers to having the same wisdom and complete.

Artificial Intelligence and Life in 2030

The intelligence of the face. The Centennial Research on Artificial Intelligence at Stanford University, "Artificial Intelligence and Life in 2030" broadly defines artificial intelligence as an activity dedicated to machine intelligence, and intelligence refers to the predictive function of a system in its environment. In July 2018, the German artificial intelligence strategy overview pointed out that as a scientific discipline, artificial intelligence refers to a research field that develops and trains computers to perform intelligent behaviour methods that only humans can previously have [3].

Financial technology (Fintech)

Financial technology (Fintech) is defined as "a new financial industry that applies technology to improve financial activities". Nowadays, the concept is used to illustrate any innovative methods that enhance and automate financial services. The rapid development of fintech is driven by innovative technologies, such as artificial intelligence and block chain, and it has gained attention from innovators, academics, and regulators. Start up firms promote more user-friendly products, scholars concentrate on the nature and the effect of the new technology, and policy-makers determine the expected usage of fintech. Although the scale of fintech is already large (with more than 1,400 fintech firms reported by Ernst & Young), it is still expanding [2].

Applications of FinTech

FinTech, known as "Financial technology, "is now a highly used buzzword. It identifies some start-up business models and new technology that have the potential to transform the financial services sector. It is a brand-new sector that emerged from the previous market for financial fashion. FinTech businesses offer financial services by utilizing various high-tech technologies. An example of FinTech at work is the easy task of replacing paper-based processes with software and applications. The financial services sector is storming up with artificial intelligence. Approximately every financial technology company in the industry has already begun to use Artificial Intelligence to save time, reduce costs and add value. Artificial Intelligence will help optimize wealth, rising risk, generating lower revenues, trading, finance, banking, lending, and vertical FinTech services in the coming decade.

The breadth of FinTech activities began with peer-to-peer lending, crowd funding, mobile payments, and money transfers before expanding to the more contemporary worlds of blockchain, cryptocurrencies, and robot investment. Customers are embracing new FinTech providers, with 50.2% of respondents to Capgemini and LinkedIn's poll stating they conduct business with at least one non-traditional firm. Few knowledgeable market observers believe that current FinTech-related investment is declining. Although capital raised by FinTech businesses climbed year over year, reaching \$54.4 billion in 2018, the United Kingdom's October 2018 FinTech Global revealed that the number of deals completed decreased from 2219 in 2015 to 1187 in 2018.

Payments and transfers, digital wallets, mobile and retail banking, trading and exchange (FX), capital markets, risk and compliance, security and privacy, financial advice services, and insurance firms are all possible applications for financial technology. FinTech businesses, unlike traditional banks with high overhead and obligations, cannot save money through innovation and adaptability. Smaller, agile, and cheaper than banks. Financial technology is generally described as any financial service's technical innovation. Industry players are designing innovations to disrupt conventional financial markets. This start-up piqued the interest of several start-ups, but many of the global central banks, like HSBC and Credit Suisse, built their versions. Artificial intelligence and big data are examples of the more advanced technologies fintech organizations utilize as payment solutions.

Following the global financial crisis of 2008, the financial technology (Fintech) industry has emerged as one of the most rapidly expanding business sectors for start-ups looking to challenge incumbent banks. Banks may improve their competitive advantage by lowering expenses with the aid of fintech startups. Fintech companies have covered four key consumer segments. The Business-to-Business Segment establishes the first category (B2B). This group comprises large, well-known regulated financial services companies with varied value chains and long sales cycles. This second sector is also categorized as B2B and includes clients of financial companies, consultants, traders, investment managers, businesses and SMEs. In the business-to-consumer segment (B2C), the third category is defined.

Small firms that bank differently and search for value and alternative funding sources are included in this sector. Consumers who prefer online banking to traditional banking and who are shopping around for the best price for their financial needs make up the final group in the B2C category. Customer experience is at the heart of the banking business because, since the global financial crisis of 2008, confidence in banks has declined, and more people are turning to nonbank financial institutions. Because of this, banks now have the chance to understand how embracing innovation and forming partnerships with start-ups may improve customer happiness and provide them a competitive edge to lessen their financial and legal restrictions.

FinTech offers tools and software to ensure the banking and financial services sectors run correctly. Start-ups have created these technologies and development companies to upend the established practices of banks and other financial service providers [4].

Fintech in banking sector

Digital innovation is transforming financial services. Innovations in financial technology such as mobile money, peer-to-peer (P2P) or marketplace lending, robo-advice, insurance technology (Insurtech) and crypto-assets have emerged around the world. In the past decade, fintech has already driven greater access to and convenience of financial services for retail users. Meanwhile, artificial intelligence (AI), cloud services, and distributed ledger technology are transforming wholesale markets in areas as diverse as financial market trading and regulatory and supervisory technology. A host of new firms have sprung up to apply new technologies to meet customer demand and most incumbents indicate that digital transformation is a strategic priority. Indeed, leading banks are rapidly closing gaps in digitization of internal processes and customer offerings, to compete with fintechs and the large technology (big tech) firms that have also entered the fray. These developments have the potential to make markets more diverse, competitive, efficient, and inclusive, but could also increase

concentration. Innovation has introduced competition and increased inclusion, particularly in emerging markets and developing economies. Fintech seems to have thrived particularly in markets where the financial system had been less developed. However, the underlying economics of intermediation combined with new technology may lead to concentration among both traditional and new financial services providers. Monopolistic or anticompetitive behaviours by big technology platforms are already being scrutinized. As financial services move towards similar technology-driven configurations, regulators are grappling with questions of how best to regulate and supervise a landscape that is increasingly characterized by new players and business models; and to address potential challenges to financial stability, financial integrity, fair competition, and consumer protection (including data privacy).

The COVID-19 pandemic has accelerated the digital transformation. In particular, the need for digital connectivity to replace physical interactions between consumers and providers, and in the processes that produce financial services, will be even more important as economies, financial services providers, businesses and individuals navigate the pandemic and the eventual post-COVID-19 world. For instance, the pandemic has already accelerated the shift to digital payments. It has also intensified e-commerce, which may benefit big tech firms and their activities in finance. Countries with more stringent COVID-19 policies and lower community mobility experienced a larger increase in financial app downloads in the wake of the outbreak. Finally, it may be speeding up work on central bank digital currency [5].

Various studies on Artificial intelligence

A study in 2021 on artificial intelligence in finance sector reported that 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 [1].

According to a paper presented in a Conference in 2022 says that AI applications in health care, communications, and arts have brought about rapid and dramatic advances in these fields. Nevertheless, the rapidly expanding potential of AI in the economy and society has raised a set of challenging issues. The fields of AI and financial technology are not spared. How can artificial intelligence (AI) be utilized in financial technology (fintech)? What will be the impact? What actionable objectives are needed to realize value from AI? This research uses a systematic qualitative research methodology, Value-Focused Thinking, to identify the actionable objectives for deriving value from AI in the fintech industry. The results of this study will provide a theoretical framework for pursuing future research as more AI applications are developed in the fintech industry. The results of this research provide guidance to practitioners for achieving value in their AI ventures [2].

Another conference paper in 2020 says that the financial industry is one of the earliest and most comprehensive industries that integrate with artificial intelligence. The application of a series of artificial intelligence

technologies such as data mining, accurate profiling, machine learning, neural networks, will provide financial products, service channels, service methods, risk management, Credit financing and investment decision-making have brought about a new round of changes. Firstly, the rapid development of artificial intelligence has a profound impact on the high-end finance of the deep service value chain; Secondly, the integrated development of artificial intelligence and finance is irreversible, risks and opportunities coexist, and the financial industry must accelerate the pace of adjustment and development; Finally, the financial supervision department further clarifies the supervision responsibility, applies artificial intelligence technology to supervision methods and means, and improves the degree of supervision automation and intelligence [3].

In 2020, a research article explored that the application of Financial Technologies in the modern banking industry. FinTech is a new world of artificial intelligence and machine learning technologies that boost the banking sector's capabilities. With this availability, the distinguished processes in the banks will have the potential to store big data and compute it efficiently. There will be cut-throat competition between the emerging banking leaders whom the huge companies will substantially influence as the power of FinTech applications will back them. This will result in revenue generation and maximum usage of available resources in various sectors like investment banking, trading, and various other verticals of Fintech. It is termed a disruptive innovation since it will bring many advancements in the modern banking sector [4].

In 2021, a paper reported that Economic frictions such as information asymmetries and economic forces such as economies of scale and scope give rise to financial intermediaries. These frictions and forces also shape market structure. While technological advances are not new to finance, digital innovation has brought major improvements in connectivity of systems, in computing power and cost, and in newly created and usable data. These improvements have alleviated transaction costs and given rise to new business models and new entrants. As technology has increased information exchange and reduced transaction costs, the production of financial services could be disaggregated. Specialized players have unbundled financial services, allowing consumers to find and assemble their preferred suites of products. However, classic economic forces remain relevant even in an age of digital production. Economies of scale and scope and network effects are present in many aspects of financial services production, including customer acquisition, funding, compliance activities, data and capital (including trust capital). Despite advances in technology, consumer search and assembly costs remain significant. These forces encourage re-bundling, and confer advantages to large multi-product providers, including technology (big tech) firms expanding into financial services from adjacent markets. The digital transformation of financial services gives rise to a set of important policy issues regarding competition, regulatory perimeters and ensuring a level playing field. Potential outcomes regarding competition, concentration and market composition include a “barbell” outcome composed of a few large providers and many niche players. Authorities must coordinate across financial regulation, competition, and industry regulatory bodies to manage trade-offs between stability and integrity, competition and efficiency, and consumer protection and privacy [5].

A Master's Thesis in 2019 reported that it is hard to deny the fact that artificial intelligence and robotization have been the centre of research for the last decades. Moreover, during the past few years it has really boomed and is now widely utilized in many companies through a wide range of sectors. Most of the time artificial intelligence has been referred to as some kind of automatization of processes within the industrial sector, but we

have started to see a greater way of using technology for the better, particularly in financial services. The financial industry has been somewhat slower in its approach of implementing artificial intelligence and accepting its powers due to several reasons. Reasons such as uncertainty, regulations, need for better cyber security, shortfalls in technology, and disruption of standard already profitable procedures are all apprehensions the industry have faced previously. Firms operating in financial services have started to see the benefits artificial intelligence brings to the company, and never before have something like this been talked more about. That is maybe one of the reasons why this transformation is called the fourth industrial revolution. It is highly disruptive, in both a good and bad way. Solutions become much more efficient, precise, and cost effective. However, with great power, comes great responsibility. Given that the financial sector is undergoing significant change at a rapid pace, precautions and security have never been more important to companies. We humans have yet to discover the many pros and cons this technology brings. Although artificial intelligence was originally introduced to us in the 1950s, it has achieved new eminence lately as computational power has risen, and the amount of accessible data has become immense [6].

A study in 2023 stated that before a decade a blast in machine learning (ML) and artificial intelligence (simulated intelligence) was occurred. The medication research business is drawn to simulated intelligence/ML approaches in view of their robotized nature, prescient powers, and the subsequent expected gain in effectiveness. Making drug research more productive will without a doubt help patients and organizations the same by reducing expenses, accelerating improvement, and raising the probability of progress. For the beyond 15 to 20 years, ML procedures have been applied in drug advancement with developing complexity. Because of a developing reliance on computerized advancements for patient data gathering, the Corona virus pandemic might additionally speed up the utilization of simulated intelligence/ML in clinical preliminaries [7].

Conclusion:

This article is all about artificial intelligence from initial to today's scenario. It is veery helpful in many ways and in almost all fields. Here application of AI was discussed in financial sector. Previous all research/studies reported many applications. Further studies is required in this field which will explore more applications in this field which are summarized below.

- i. The challenges of AI with pros and cons in financial sectors will come to know. Only advantages comes in focus not the disadvantages which is very much required.
- ii. More applications of artificial intelligence will come to know which will make changes in financial industries in the future.
- iii. How artificial intelligence (AI) are utilized in fintech and how it can be improved. Since it is of great use but more applications should introduced.
- iv. Different Fintech Methods Based on Artificial Intelligence will come to know. One work can be done in many ways. Easy, comfortable, short time taking methods should introduced regarding its application.
- v. Different applications of AI in Fintech will come to know. More studies will introduce more applications of AI in this sector.
- vi. Further studies will help in knowing more about the policy issues regarding competition, regulatory perimeters etc.

- vii. Results of analysis of the AI technology regarding the potential applications, implications, and risks it may propagate in financial services. More studies are required to get the answer of these questions.
- viii. Obstacles in AI use like Data quality issues, ethical dilemmas and possible biases and how to deal with these issues will be answered.

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