



INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

ROLE OF ARTIFICIAL INTELLIGENCE IN FINANCE

¹Dr. Vishakha Abhay Gaidhani,
PhD in Organizational Management, SPPU
Assistant Professor,
MBA Department,

Sir Visvesvaraya Institute of Technology, Nashik, Maharashtra, India

Abstract: 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 finished 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.

Index Terms - Artificial Intelligence, Robotization, Automization, Financial services.

I. INTRODUCTION

Alan Turing asked, "Can machines think?" in 1950. since then, applications of artificial intelligence, also referred to as AI, have been met with varying degrees of success. However, there has been a resurgence of interest in AI in recent years, and it has found novel uses in the global financial services industry. The most recent AI innovation wave has been primarily driven by the availability of big data, improved technology, cloud computing, and faster special purpose hardware. Growth in the Fintech market is being fueled by AI and machine learning (ML). In general, the new technologies, services, and businesses that have altered financial services are referred to as "Fintech." It encompasses, but is not restricted to: robo-advising, crowdfunding, cryptocurrencies, blockchain¹, smart contracts, mobile payments, and AI platforms. According to Future Today Institute's 2017 report, AI topped the list as a significant trend in Fintech and financial services.

We rely on a variety of technologies in almost every circumstance because technology has become an important part of our day-to-day lives. Our lives have undergone significant transformations since the advent of computing power and the third industrial revolution. Artificial intelligence, or AI for short, is one of the technologies reshaping the way machines and data are used. The term "artificial intelligence" (AI) is probably familiar to most of us because it sounds fancy and up-to-date. However, the origins of AI can be traced all the way back to the 1950s, when mathematician Alan Turing was debating the question, "Can machines think?" Currently, professors and executives in the financial industry believe that AI technology will transform the sector. Over 3600 AI startups have been established since 2013 and have raised a total of \$66 billion in funding. Businesses and individuals may be forced to rethink how technology is used at this point, marking the beginning of the so-called fourth industrial revolution.

However, there are a number of reasons why the financial sector has been reluctant to implement and use AI. Uncertainty, technology gaps, and regulations are just a few of the major worries that have created entry barriers for AI. Firms in the financial services sector have begun to recognize the numerous benefits that AI offers as a result of the widespread adoption of this technology across a variety of sectors and industries. Cognitive robotics are now and in the future essential for customer and client interaction and retail banking. One can replicate human intelligence by utilizing DL, ML, big data, NLG, and NLP, where self-correction and learning are essential to a successful implementation. In the past, AI integration and the hiring of experts in the field were only available to large, established businesses. However, AI frameworks with a high level of abstraction have been developed over time, and smaller businesses are now also able to create intelligent systems with just a few lines of code.

II. HOW AI IS CHANGING THE FINANCIAL SERVICES INDUSTRY :

The financial services industry is the largest spender on AI services outside of the technology sector and is growing very quickly. Hedge funds and HFT firms were the primary users of AI in finance up until recently; however, applications have now expanded to include banks, regulators, Fintech, and insurance companies, to name a few.

Algorithmic trading, portfolio composition and optimization, model validation, back testing, robo-advising, virtual customer assistants, market impact analysis, regulatory compliance, and stress testing are all examples of AI applications in the financial services sector.

- **Fraud detection and compliance**

Online fraud has also grown as e-commerce has grown in popularity. Action Fraud reports that there was a 66% increase in the number of reported cases of payments-related fraud²⁶ in the UK between 2015 and 2016. The FCA says that UK banks spend £5 billion a year fighting financial crime. Over \$70 billion is spent annually on compliance by US banks. Due to the large fines imposed on many large banks for failing to stop illegal financing, many banks have turned to AI methods to improve their operations.

One of the simplest methods for detecting fraud is "Benford's Law." By performing an analysis on the first digits of a particular set of data, it is accomplished. A set of "real" data will have a predictable distribution of first digits. Since the late 1800s, Benford's Law has been in use.

In this case, AI is advantageous because ML algorithms can analyze millions of data points to identify fraudulent transactions that humans typically overlook. ML also aids in lowering the number of false rejections and enhancing the precision of real-time approvals. Nowadays, fraud detection requires more than just a list of risk factors. Fraud detection systems can now actively learn and calibrate in response to new potential (or actual) security threats by employing ML techniques. Bank systems can use machine learning to flag unusual activities or behaviors (called "anomalies") for investigation.

One of machine learning's most successful applications is the detection of credit card fraud. Monitoring systems, or workflow engines, that are trained on data from previous payments are available in banks. Large collections of credit card transaction data serve as the foundation for algorithm training, back testing, and validation. Events can be classified as "fraud" or "non-fraud" by classification algorithms, and fraudulent transactions can then be stopped in real time.

- **Banking chatbots and robo-advisory services**

In the United States, the unit cost of financial intermediation has remained around 2% for 130 years (Philippon, 2015). In Europe and the United States, the cost of financial intermediation has decreased only marginally since the financial crisis of 2008. Robo-advisors and chatbots are appearing in the financial services industry to assist customers in selecting investments, banking products, and insurance policies as part of the response to the financial crisis. According to Future Today Institute, a software application known as a "bot" is designed to automate specific tasks using AI technology. An algorithm-based digital platform that provides automated financial advice or investment management services is known as a robo-advisor.

A decade ago, the term "robo-advisor" was almost unheard of, but it is now fairly commonplace in the financial landscape. However, the term is false and does not even mention robots. Instead, robo-advisors are algorithms that tailor a user's financial portfolio to their objectives and tolerance for risk. Natural language processing (NLP) and machine learning (ML) algorithms have made chatbots and robo-advisors powerful tools for providing personalized, conversational, and natural experiences to users in a variety of fields.

Millennial customers, who are less able to verify the fees paid to human advisors and do not require a physical advisor to feel comfortable investing, have become increasingly interested in chatbots and robo-advisors.

AI chatbots can improve the banking industry in a number of ways, including by assisting customers with money and savings management. Plum, for instance, is a Facebook Messenger-accessible chatbot that enables customers to save money incrementally. Plum is connected to the customer's bank account after they register, and its AI engine looks at the customer's spending and income history to figure out how much they can save. The Plum savings account then receives periodic reporting of small deposits.

Additionally, banks are utilizing chatbots to enhance their self-service interfaces. Erica²⁹, the Bank of America's artificial intelligence chatbot, is now available on the mobile app via voice or text message. Analytics are also used by Erica's AI engine to help with personal finance management. COiN, an AI technology that reviews documents and extracts data in significantly less time than a human, has received investment from JP Morgan. A COiN can review approximately 12,000 documents in a matter of seconds, whereas a human would spend more than 360,000 hours working on the same documents.

Venture capital and customer service budgets are rapidly expanding in the area of chatbots and conversational interfaces. These chatbots have needed to be built with powerful natural language processing engines and a lot of interactions with customers about finance. Customers of banks are finding it increasingly difficult to distinguish between an AI interface and a human being because of natural language processing. The Mizuho Group has a robot that answers asset management questions and compiles documents, and Japan's three megabanks are using AI and robotics to streamline customer questions.

- **Algorithmic trading**

Global financial markets are now dominated by algorithmic trading (AT). The origins of AT, also known as "Automated Trading Systems," can be traced back to the 1970s. A brief overview of the development of the AT field is provided. AT is: AI trading is an approach to machine learning that learns the structure of the data and then tries to predict what will happen. Algorithmic trading is about putting trading rules into a program and using the program to trade.

Nowadays, complex AI systems are used in algorithmic trading to make quick trading decisions. Computers are responsible for 50-70% of equity market trades, 60% of futures trades, and 50% of Treasury trades. The market AT share is closer to 40%.

The ability to automatically and simultaneously check multiple market conditions, the ability to execute trades at the best possible prices, increased accuracy and reduced errors, and the likelihood of reducing human errors caused by psychological or emotional conditions are all advantages of AT.

Regarding the second advantage, the European Space Agency's Mosaic Smart Data algorithms are currently being used to prevent "fat finger" trades³⁴. A fat finger trade occurs when a trader presses the incorrect key by accident. Mosaic Smart Data has recently been used in high-profile cases at Samsung and Deutsche Bank to analyze millions of financial trading data points. Additionally, the algorithms are being used to spot fraud in the financial services sector.

Hedge funds, proprietary trading houses, bank proprietary trading desks, corporations, and the next generation of market makers are the clients of algorithmic trading. AT entails making specific trading decisions, placing orders, and managing those orders once they have been placed. AT enhances the informational content of quotes and increases liquidity. Slower trades, on the other hand, may incur higher adverse selection costs from AT.

- **Proptech**

ML now plays a crucial role in a wide range of financial ecosystem functions, including loan approval, asset management, and risk assessment. These new technologies have significantly altered the global real estate industry, which is worth more than \$200 trillion. The emerging technologies that are disrupting real estate markets are referred to as proptech. The newest real estate business models incorporate AI.

Leverton is a data extraction platform powered by AI that was founded in Germany. It uses DL algorithms to automatically extract important information from documents like rental leases, break options, and overall clauses. A platform that is comprehensible in twenty languages⁴⁵ makes it simple to access structured data. Additionally, the platform provides a tracable audit between the underlying documentation and the structured data output. Instead of using manual valuation, proptechs in Singapore use AI to generate formulas for calculating a property's value using a combination of algorithms and comparative market analysis.

- **Corporate Governance Practices**

It is also possible to use AI algorithms in corporate governance settings. Select company directors based on performance using machine learning algorithms. The ML algorithm "learns" from previous director selection processes. Because the directors predicted by algorithms to perform poorly perform significantly worse than those predicted to perform well, they conclude that ML has the potential to enhance corporate governance practices. Investigate terms related to deal incidence and recent performance in mergers and acquisitions (M&A). Li capture corporate culture and its role in M&A activity using unsupervised machine learning.

- **Loan and Insurance**

ML in finance thrives in the loan and insurance underwriting industry. ML algorithms can be trained on millions of consumer data points at large banks and publicly traded insurance companies. and the outcomes of financial lending or insurance (has the individual defaulted on the loan, paid it back on time, been in a car accident, etc.) use machine learning techniques to predict loan repayments by utilizing mobile phone data.

The underlying trends that can be evaluated using algorithms and continuously analyzed to identify trends that may influence lending and insurance in the future (for example, are there an increasing number of young people who are involved in car accidents in a particular state)? Cytora is using AI in the insurance industry to better assess their customers' risk, resulting in more accurate pricing and fewer claims.

III. CONCLUSION :

Banking and financial services adoption, the use of AI in apps was most prevalent, followed by KYC/AML, Chatbots, Security Compliance, and aiding in the quicker and easier fulfilment of client demands. Customers receive more dedication from representatives to banking and financial services by providing new training to enhance AI workplace practises. Additionally, it is utilised to comply with regulations, spot fraud, and judge a person's creditworthiness.

IV. REFERENCES

1. Alarie, Benjamin and Niblett, Anthony and Yoon, A. (2016) Regulation by Machine. Available at SSRN: <https://ssrn.com/abstract=2878950>
2. Altman, E. I., Marco, G., & Varetto, F. (1994). Corporate distress diagnosis: Comparisons using linear discriminant analysis and neural networks (the Italian experience). *Journal of Banking & Finance*, 18(3), 505-529.
3. Amilon, H. (2003). A neural network versus Black–Scholes: a comparison of pricing and hedging performances. *Journal of Forecasting*, 22(4), 317-335.
4. Angelini, E., di Tollo, G., & Roli, A. (2008). A neural network approach for credit risk evaluation. *The quarterly review of economics and finance*, 48(4), 733-755.
5. Antweiler, W., & Frank, M. Z. (2004). Is all that talk just noise? The information content of internet stock message boards. *The Journal of finance*, 59(3), 1259-1294.
6. Athey, S. (2017). *The Impact of Machine Learning on Economics*. In *Economics of Artificial Intelligence*. University of Chicago Press.
7. Athey, S. (2015). Machine learning and causal inference for policy evaluation. In *Proceedings of the 21th ACM SIGKDD international conference on knowledge discovery and data mining* (pp. 5-6). ACM.
8. Athey, S., & Imbens, G. W. (2017). The state of applied econometrics: Causality and policy evaluation. *Journal of Economic Perspectives*, 31(2), 3-32.
9. Auria, Laura and Moro, R. A. (2008) Support Vector Machines (SVM) as a Technique for Solvency Analysis. DIW Berlin Discussion Paper No. 811. Available at SSRN: <https://ssrn.com/abstract=1424949> or <http://dx.doi.org/10.2139/ssrn.1424949>
10. Bagherpour, A. (2018) Predicting Mortgage Loan Default with Machine Learning Methods. Working Paper.
11. Baker, Tom and Dellaert, Benedict G. C., *Regulating Robo Advice Across the Financial Services Industry* (2018). *Iowa Law Review*, Vol. 103, P. 713, 2018; U of Penn, Inst for Law & Econ Research Paper No. 17-11.

