ISSN(Online): 2320-9801
ISSN (Print): 2320-9798

International Journal of Innovative Research in Computer and Communication Engineering

(An ISO 3297: 2007 Certified Organization)

Website: www.ijircce.com

Vol. 5, Issue 6, June 2017

A Survey on the Role of Artificial Intelligence in FinTech

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ABSTRACT: This paper aims to discuss the influence of artificial intelligence in the financial domain and its potential in improving the services provided by the financial institutes. AI has lots of implementations and it is being used in different sectors for various reasons. In this paper, we will discuss how AI is used in the financial sector, what are the benefits that AI offers to FinTech and the different ways in which it can improve the operations of a financial institute.

KEYWORDS: Artificial Intelligence, Machine Learning, FinTech.

I. INTRODUCTION

Artificial intelligence is a term used in many industries, be it medial, mechanical, gaming and many more. It is gaining importance at a very fast rate. Now-a-days every industry wants to incorporate Artificial intelligence into their technology. It is becoming the hottest topic in the market.

Artificial intelligence (AI) is not new in the financial sector. If we consider that the definition of AI is the ability for machines to interact and learn to do tasks previously done by humans. Through machine interaction and learning, natural language can be processed and decisions made faster and more accurately than was possible in the past.

One of the outcomes of artificial intelligence is that machine learning improves over time as more and more data is processed and more positive results achieved. Despite this achievement, and successes in virtually all industries, FinTech has taken a more cautious approach.

The interest in AI has grown a lot because of both capabilities and business needs. The growth of structured and unstructured data, availability of new technologies such as cloud computing and machine learning algorithms, increased regulation and increased consumer expectations have created a perfect storm for the expanded use of artificial intelligence in financial technologies.

The benefits of AI in financial sector are widespread, reaching back office operations, compliance, customer experience, product delivery, risk management and marketing. Now the financial institutes can work with huge historical data for every decision-making process.

II. WHAT IS ARTIFICIAL INTELLIGENCE?

Artificial intelligence is the combination of three different technologies being machine learning, natural language processing and cognitive computing. The concept of Artificial Intelligence is to simulate the intelligence of humans into machines with the help of sophisticated machine learning and natural language processing algorithms. There is always a limit to the speed with which humans can perform the given tasks. Artificial intelligence can be used to overcome this challenge with human intelligence by transferring the human intelligence to cognitive machines with supreme computational capabilities.

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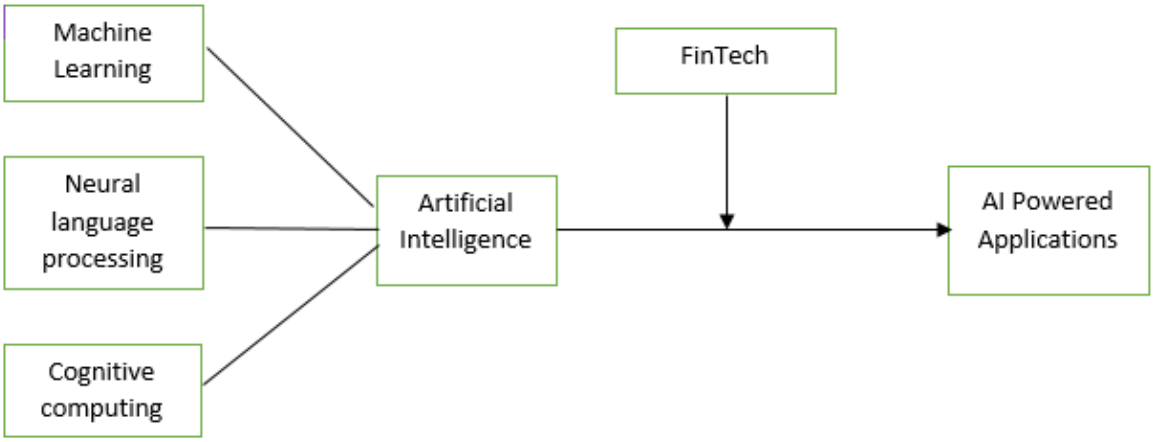

Fig.- Architecture

Compare Artificial Intelligence and Automation

Artificial intelligence and automation are the terms that are interchangeably been used by many businesses in different sectors, but there is a distinction. To improve efficiency and accuracy manycompanies are using automation. Automation is nothing but replacing mostly repetitive tasks, with machines. Automation has been heavily used in factory processes for more than a century. Now software'sare being automated to perform many tasks such as matching data records, making calculations and looking for exceptions. Artificial intelligence is about replacing the human decision-making part with more sophisticated technologies. These are not repetitive tasks, but more of a judgment-based work which requires a complex set of algorithms and machine learning which can be used with a variety of inputs to predict future outcomes, recognize patterns and make decisions.

III. CURRENT TRENDS IN FINTECH AI

Artificial Intelligence is gaining popularity in fintech sector. They are starting to use AI in several ways. Most recently, the California-based robo-advisor, Wealthfront, has added artificial intelligence capabilities to track account activity on its own product and other integrated services such as Venmo, to analyse and understand how account holders are spending, investing and making their financial decisions. They are doing this to provide more customized advice to their customers regarding their finances. Sentient Technologies, which has offices in both California and Hong Kong, is using AI to continually analyse data and improve investment strategies. The company has several other AI initiatives in addition to its own equity fund. AI is even being used for financial institutes customer service. RBS has developed Luvo, a technology which assists its service agents in finding answers to customer queries. The AI technology can search through a database, but also has a human personality and it is built to learn continuously and improve over the period of time. The technology is being evaluated to understand its potential to directly interact with customers without losing the personal touch. [6]

IV. AI FOR FINANCIAL INSTITUTIONS

What it means?

The integration of AI into the financial sector will have many impacts:

- Costs will be reduced as efficiency increases.
- Computers can process much more information than humans whilst making fewer mistakes.
- Allowing for a better analysis of data and greater scalability of systems.

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The key use of AI in FinTech will be augmented decision making. It will allow analysts to make complex decisions with the help of machines which offer both pre and post decision making support, generated by analysing historical data and emerging trends. Day-by-day these augmented decisions will become highly important as financial products become more complex and as more and more data is produced.
AI will be crucial in the development of predictive analytics for market behaviour and customers which will create more accurate risk management solutions.

Why do Banks and Financial Services use AI?
In the Baker and McKenzie survey carried out with Euromoney, three main problem areas for banks to apply AI include risk management, financial analytics and investment/portfolio management. It's all about decision making - internally by the banks and externally on the client side. These could range from decision on branch office location, loan optimizing, customer preferences and investment advice. AI is impacting the Financial Services sector more than the others with sophisticated algorithmic trading, posing a serious challenge for traders as well as regulators. Demand for non-equity trading algorithms serving institutional asset managers and retail investors is expected to expand AI usage in global financial markets. A report from the US Commodity Futures Trading Commission cited that algorithmic trading systems were responsible for nearly 80% of foreign exchange futures trading volume, 67% of interest rate futures volume, 62% of equity futures volume, 47% of metals and energy futures volume, and 38% of agricultural product futures volume between October 2012 and October 2014. Algorithms were deployed to manage risk and exposure. Thomson Reuters' recent report estimates algorithmic trading systems to be handling 75% of the volume of global trade and industry insiders predict steady future growth. [2]
Three prime reasons cited for Algorithmic Products are [2]:
1. Futures and institutional investment market trigger demand for innovation in wide ranging algorithms.
2. New regulations and compliance in institutional investment markets compel extensive automation of trading in assets that were traditionally not digitalized. One instance is the anticipated shift from telephone to electronic trading in fixed income markets.
3. As the retail trading market continues to expand globally, it opens up algorithmic trading to new areas pushing for enhanced tech applications driven by AI.

What it doesn't mean?
It is often assumed that AI will reduce the job opportunity, but this is not the case. AI in finance is basically automating some tasks which will result in the roles being altered but not completely removed. Simple tasks can be carried out by AI systems leaving workers to dedicate their time in performing higher quality tasks which are not only more interesting but also add more value to their companies.
It is important to understand that, while more tasks may be given to the machines, human beings will not be relieved of responsibility for their actions. The outcomes of decisions made by AI systems will still remainwith those who programmed them, hence, maintaining the need for answerable human oversight of the sector.

How AI can be used to improve compliance?
Business functions such as compliance, normally used to heavily rely on rules-based systems, are perfect for the use of AI. This has been a key driver of recent innovations in regulatory technologies (RegTech). Rules-based systems produce large amount of "noise" that is - vast amounts of unstructured and mostly irrelevant information which humans need to manually review and perform appropriate processing on it, creating unnecessary burden for even the largest of compliance teams. By automating simple tasks like real-time scanning of changes to Sanctions and Watch lists workloads can be significantly reduced. Smart systems that learn from your decisions can also dramatically reduce the number of 'false positives' (incorrect risk alerts) produced by searches, in some cases by as much as 60%. [1]

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V. BENEFITS OF AI IN FINANCIAL SECTOR

Artificial intelligence brings a lot of benefits on the table. It can provide a lot of different scenarios which provide better solutions for the existing technology.

1. Enhanced customer personalization and recommendations

Without the intervention any human counterpart AI can provide personalized communications and advice. With AI, algorithms can regularly rebalance the portfolios to maintain the original investment guidelines and operate at low costs. [5].
Recommendation engines play a very important role in AI. It uses historical data about the user and multiple offerings from the bank which is used to provide the appropriate recommendations to the useraccording to their preferences. So far, it is very successful and is considered to be an important component in revenue growth of the top financial institutes.
With the help of faster computational power and the concept of Big Data, machines coupled with efficient and powerful AI algorithms are ready to play an important role in making efficient use of recommendation engines in financial sector

2. Productivity Gains

Repetitive processes can be made more efficient and useful using AI which fasts up the process from customer communication flows to back office processing. This tedious process can now be a highly personalized interaction which is based on user activity after opening. This level of personalization was almost impossible to achieve without the benefits of machine learning and AI. [5]
It is also very important to get real time update on customer informational documentation, compliance requirements and "frequently asked questions" for the products which can be achieved using AI

3. AML Pattern Detection

Generating money from illegal actions is a malpractice, there are various laws or regulations , set of procedures which is specifically designed to stop this behavior and this concept is referred by Anti-money laundering (AML). In most cases, money launderers hide their actions through a series of steps that make it look like money that came from illegal or unethical sources are earned legitimately. [5]
It has been observed that many major banks around the world are currently shifting to artificial intelligence from rule based software systems because it provides more robust and smart solution to anti-money laundering patterns.

4. Fraud Detection

Fraud detection is one of the fields which has received massive boost in providing accurate and superior results with the intervention of artificial intelligence. By an ongoing review of account activity patterns can be monitored, with aberrations to patterns being flagged for further review. Over the last decade, AI has not only significantly improved the monitoring process, but is now able to respond in real time to potential fraud.

5. Chat bots

Human chats are simulated without any intervention from humans by Chat bots which is an automated chat system based on artificial intelligence. It is programmed in such a way that it identifies the context and emotions in the text chat entered from the human end and provides most appropriate reply. With time, these chat bots collect massive amount of data for the behavior and habits of the user and learns the behavior of user which helps to adapts to the needs and moods of the end user. [5]
Chat bots are widely used in the banks to provide a revolutionary solution to manage customer relationship at personal level.

6. Algorithmic trading

There are many Hedge funds across the world which are using high end systems to deploy AI models which has the capacity to make investment decisions by taking inputs from several sources of variation in financial markets and entity sentiments. It has been observed that around 70% of the trading is carried out by automated AI systems. Most of these

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hedge funds follow different strategies for making high frequency trades (HFTs) as soon as they identify a trading opportunity based on the inputs. [5]
Two Sigma, PDT Partners, Winton Capital Management, LLC, Citadel, Point72, Man AHL, DE Shaw, Ketchum Trading, Vatic Labs, Cubist are some of the hedge funds active in AI space.

VI. FUTURE OF AI IN FINTECH

AI is very important for financial services firm because their major goal is risk and fraud detection and cost reduction. Ventures are expected to deliver a truly valuable products and services so that they could stand out because of which there is a stiff competition in Fintech. The venture which tends to fulfill the user requirement effectively often wins but it has become increasingly challenging to differentiate and find that X factor.
The concept of AI would be much appreciated if it could irradiate the guess work and human error from finance. Because of this very reason the further innovation of Fintech is largely dependent on AI.
AI creates disruptive technology for the consumer because of which Ai is an essential gain forFintech. The key areas for successful integration of AI services to enhance the user experience are payments and digital transactions.
As artificial intelligence eliminates the possibility for human error, the system can really get to understand the consumer, where human efforts can be inconsistent and lack good service, and has the potential to make traditional banks exist and influence a digital surge.

VII. CONCLUSION

Artificial intelligence is already one of the defining trends in fintech and an increasingly popular buzz word in the industry. It holds the promise of efficiency, better decision-making, stronger compliance and potentially even more profits for investors, the technology is young. Financial institutes need to find ways to lower costs and technology is the most obvious answer.They must build new ways to save customers money through an integrated set of savings and smart spending tools. Advanced tools now provide the industry with more capabilities to provide intelligent, personalized advice to offer new forms of customer advocacy beyond traditional services. The fintech sector can make great use of allowing the technology to provide customized advice, decision-making, assisting with collaboration and enabling end-to-end data integration.

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