Libyan International Medical University
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The Artificial Intelligence in Finance

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Introduction

Artificial intelligence (AI) is a system where machines are replacing human intelligence, thoughts and to some extent behavior and emotion (Buchanan, 2019).

Applying AI in the finance sector can improve many aspects and it can be done in two ways.

1- Using AI to apply mathematical and statistical models that will help with complex procedures and data analysis. For example applying AI in the stock market helps forecasting and predicting future prices, inflations, and recessions that helps shareholders to make better decisions (Zavadskaya, 2017).

2- AI can be applied via modern and reliable services, such as the smart wallet. Leading to a higher customer satisfaction rate, banks and financial institutions that adopt AI have a high competitive advantage (Patel, 2018, pg. 2787).

02
Literature Review

From the investigation of 14 research papers and specifically, (Zavadskaya, 2017), (Shao, et. al, 2021) and (Kumari, et. al., 2021) who used mathematical models, to investigate the impact of AI on the financing sector.

It was concluded that artificial intelligence does in fact have a huge impact on the improvement of finance specifically on portfolio management, banks management and the management of the stock market.

However, even with the numerous advantages that AI brings to finance the results still remain inconclusive and need further investigation as technology in general is rapidly changing and thus a lot of aspects still remain unclear and yet to be discovered.

My recommendation for further research is to investigate and study how a certain type of AI model affects a specific area in finance as the topic is very broad and relatively new, thus focusing on a specific part will generate more accurate results rather than studying the topic as a whole.

03

Definition and History

“The term “artificial intelligence” was coined in 1956 by John McCarthy. The Oxford English Dictionary defines AI as “The theory and development of computer systems able to perform tasks normally requiring human intelligence, such as visual perception, speech recognition, decision-making and translation between languages.” FSB (2017) defines AI as, “The theory and development of computer systems able to perform tasks that have traditionally required human intelligence.” (Buchnan, 2019, pg. 8).

“The world is currently experiencing a third wave of AI research, driven by the development of the deep learning, which allows for the creation of much more complex neural system and a more efficient application in the real world. The distinctive difference between it and the previous types of AI is the lack of human intervention in the system. While the programmers were required to prepare training data, train, formulate analytical logic and evaluate the system’s results and accuracy for the ANN, they are not needed for training of deep learning system, as it trains itself. “ (Zavadskaya, 2017, pg, 14).

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Artificial Intelligence in Finance

Artificial intelligence can be applied in various sectors of the finance industry.

“Outside of the technology sector, the financial services industry is the biggest spender on AI services and is experiencing very fast growth (Citi, 2018). Until recently hedge funds and HFT firms were the main users of AI in finance, but applications have now spread to other areas including banks, regulators, Fintech, insurance firms to name a few.” (Buchnan, 2019, pg.11).

The two types that are being presented are:

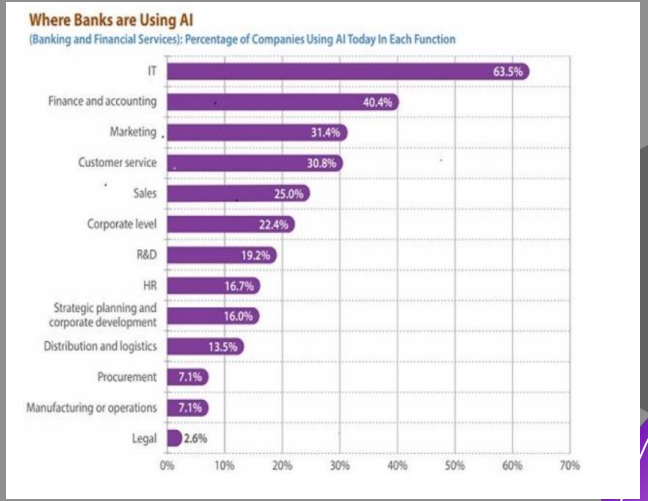
1-Application of AI in : **Banks**

2-Application of AI in: S**tock markets**

Applications of AI in Banks

“Banks use artificial intelligence systems today to organize operations, maintain book-keeping, invest in stocks, and manage properties. AI can react to changes overnight or when business is not taking place. In August 2001, robots beat humans in a simulated financial trading competition. AI has also reduced fraud and financial crimes by monitoring behavioral patterns of users for any abnormal changes or anomalies. AI is increasingly being used by corporations. Jack Ma has controversially predicted that AI CEO's are 30 years away.” (Zakari, 2021, pg. 4).

Figure 1: *Where Bank are Using AI*



(Patel,2018, pg. 2788)

Applications of AI in Stock Markets

AI is applied in the stock market via various methods, including online trading, and decision making, since AI have the ability to analyze demand and supply curves thus estimating and predicting future prices which will help investors in making better decision. Moreover, artificial intelligence improve market efficiency by reducing information asymmetry as well as limiting the consequences of behavior. Not to mention rational choice and expectation, portfolio optimization, and counterfactual thinking, all of which AI has had a great impact on. (Zakari, 2021, pg. 4-5).

Applications of AI

1. Fraud Detection and Increased Security

AI has enabled financial institutions to recognize fraudulent patterns.
Increase customers security and safety in online transactions .
Decrease the rate of cyber crimes, scams and fraud.

2. Algorithmic Trading

“Algorithmic trading is about implementing trading rules into a program and using the program to trade, [and AI trading] can be defined as an approach to machine learning that learns the structure of the data, and then tries to predict what will happen.” (Buchanan, 2019, pg.15)

3. Banking Chatbots and Robo-Advisory Services

“Robo-advisors are algorithms built to calibrate a financial portfolio to the user’s goals and risk tolerance. Chatbots and robo-advisors powered by natural language processing (NLP) and ML algorithms have become powerful tools with which to provide a personalised, conversational and natural experience to users in different domains.” (Buchanan, 2019, p.13).

4. Other Applications of AI in Finance

- Spending Pattern Predictions.
- Stock Brocker System
- Text Mining

05
Conclusion

The first wave of AI was when logic rules represented knowledge however, it lacked learning capability, poor management, and poor handling of uncertainty.

The second wave statistics was embedded in AI however, it is lacking in contextual capability and minimal explainability.

The third and current wave systems were developed that construct explanatory models and in it, the systems were capable of learning and reasoning with new tasks and situations. Thus, it was called *explainable AI*. “ (Onwudebelu, 2021, pg. 1)

AI has positively impacted the finance industry specifically stock markets and banks in many ways.

It is a relatively new topic that still needs research as some of the information remains inconclusive.

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Thank You!
Any Questions?