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**RESEARCH ARTICLE**

**IS THE IMPACT OF ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING ON MODERN DAY FINANCE SIGNIFICANT?**

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**Manuscript Info**

**Abstract**

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**Introduction:-**

**Overview of AI in the financial sector**

Finance, in its literal sense, is the provision of funding and management of capital for individuals, businesses and the government. There are primarily 3 types of finance- Personal finance( Individual), Corporate finance( Business) and Public Finance( Government). This research paper will predominantly focus on the impact of Artificial Intelligence( AI) on corporate finance, as it tends to be a vast stream and effective operations of which is essential to drive the growth of a business and the economy. Artificial Intelligence is the simulation of human intelligence in machines, through the use of data and algorithms, which help think and perform tasks which previously needed human intervention . The financial data has exponentially increased over the years and will continue to do so , along with

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the nature of the corporate markets being dynamic. Therefore, AI witnessing significant advancement has hence revolutionised this sector by using vast amounts of data to make predictions, improving security measures, detecting fraudulent activities and risk assessment. This research paper attempts to compliment the impact of AI and Machine learning on this industry, while also questioning aspects not yet discussed and evaluating the negative effects of AI as well.

### AI in Investment Strategies and Portfolio Management

When it comes to investing capital, the primary aim of any individual or organisation is to make a return on that investment. Therefore, portfolio management simplifies this process to meet specific financial goals, taking factors like diversification and asset allocation into account. The financial market tends to be highly volatile and dynamic in nature and therefore timely insights leading to correct decisions can play a significant role in the return made. This is where AI comes in. With its capability to analyse vast amounts of data in unparalleled speeds, it leads to the investors making better predictions about the future, with a level of accuracy that surpasses traditional methods. AI driven portfolio management strategies help navigate volatile markets, providing real time market analysis. This is a flexible approach which helps managers quickly adjust their decisions, minimising risks and costs and maximising profits and returns.

The main functions of incorporating AI in portfolio management are to streamline data analysis, generate insights and support decision making. As per research by Mercer, 91% of managers are either already using or are planning to use AI in their investment strategy, by using them to construct portfolios, execute trades and interpret results.

Along the same lines, I have also benefited from the advancements in technology in portfolio management. As an avid investor with holdings across several different sectors, technology helps streamline the daily changes and allow more convenient and summarised analysis to take place, in a faster way. I use moneycontrol portfolio management software which basically makes me mention all the shares which i own, and shows me the daily price movements in them with one click. Furthermore, all news relating to the stock and updates from the company are also mentioned along with the stock. This shows that technological upgradations has had a large scale positive impact on the retail investors as well, who choose to invest in shares, bonds, or ETFS, for a personal gain.





### **How have changes in AI affected the Banking Industry ?**

AI has played a major role in the banking industry for years, particularly in risk management like Credit Adjudication. Credit Adjudication in simple terms is the evaluation of an individual's credit worthiness by analysing factors such as credit history, debt levels and income . These factors help make a decision whether to approve or deny credit applications, which is one of the main functions of a bank as the bank loans they issue to companies and individuals leads to revenues for them, and the inability of a customer to pay the loan will result in heavy losses. The chief digital officer for a B2B fintech company- Wex explained how AI is no longer an option for senior level managers but is something that is imperative. It is essential in today's context and helps organisations integrate the several business functions, across all sectors to stay relevant and help drive future success.

AI is expected to also play a major role in relationship based banking as technology will replace the need of a one to one conversation between a client and a relationship manager from the bank. The use of conversational interfaces like the website having AI characters will lead to efficient and faster transactions, and also cost savings for large scale banks across the global economy.

According to the AI development company, by the end of the year 2025, approximately 75% of financial institutions are set to spend \$31billion on the integration of AI in their systems. This compliments the fact that the integration of custom AI in banking services has sparked a technological revolution, reshaping several facets of financial services. AI is leading to improvements in several segments of banking, from customer services to fraud detection and security measures, leading to more efficient banking operations and a secure financial system. However, along with increased usage of AI in banking operations, it is also important to strike a balance between what leads to efficiency gains and what leads to ethical misjudgements. Data privacy may often be at stake with the use of AI, and hence strict data privacy measures must be undertaken to ensure the sustainability of AI. If used strategically and and incorporated competitively, the future of AI promises a dynamic customer focussed environment in this industry.

### **Use of AI in credit analysis and lending decisions**

A bank or a finance company has a core function of issuing loans and lending money to individuals or organisations. Hence, they issue debt. Therefore, it is important that these banks analyse the credit risk associated with these loans issued, which is where the role of AI comes in. AI combines the traditional credit scoring methods with other data of an individual like their social media activity or transaction histories, to provide a more holistic view on their credit worthiness. AI models provide better risk assessment with more data. Therefore, AI models can predict the chances of an individual defaulting on a loan, and also advise the bank what the suitable amount of loan granted to an individual should be, keeping their credit history in mind. Furthermore, AI has often helped improve customer satisfaction for a business. One way this is is that often, AI can help customise loan plans according to a customer's

financial situation better than a bank employee, due to the vast data that AI algorithms contain around the world. Analysis of customer data and profile has been happening for many years in banks, and it is noted that they often take several days and months. However, AI helps improve this process by carrying out consumer analysis quickly, without any individual biases which may occur due to specific employee customer relationships.

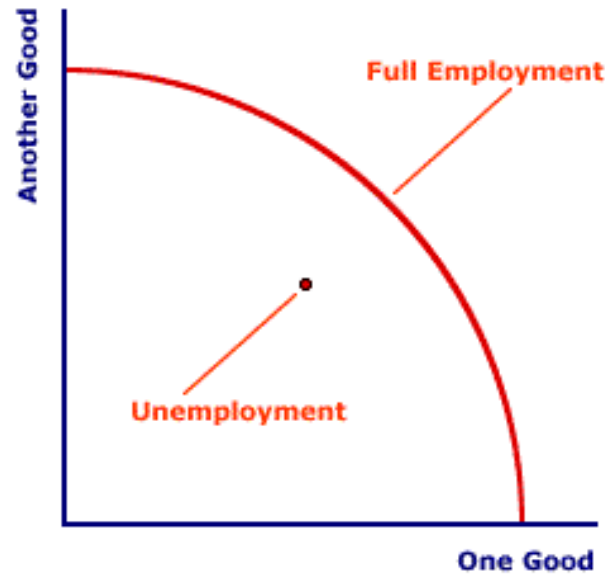
AI has also aided banks in fraud detection. AI can help detect unusual patterns in borrower behaviour, which might indicate fraudulent activity. For example, if a high profile individual which the bank has loaned a large amount of money, is detected by the AI models to have earned a significant proportion of their income from money laundering activities, or been seen to move their money to offshore accounts located in other countries, it can be useful information for a bank to prepare a remedial plan on finance recovery. Irrecoverable debts and defaulted loans are a large chunk of the costs for a bank and other organisations in this industry, and therefore AI reducing the chance of defaulting has a direct impact on this cost. This can help reduce the costs of the bank, therefore leading to greater financial returns.

An example of such an AI is CRiskCo's API model, which has several benefits such as- automated calculation of financial ratios( such as Debt to equity, Quick ratio,etc) within few seconds, providing valuable credit insights with credit reports and an ongoing monitoring process of the customer's financial actions which help detect fraudulent activities. Therefore, this AI helps standardise the consumer data and provide real time financial health alerts and predictive analysis through the traditional credit scoring methods, but in a much lesser amount of time than employees. This is another example of how AI replacing employees in the credit scoring aspect of banks has reduced costs for them and also saves time . Therefore, all these benefits from AI infused models help lead to a customer centric approach to banking, and better financial returns for the bank.

### **Benefits and drawbacks of the use of AI in Finance**

Customers and clients nowadays prefer businesses that use the latest technology and up to date services. This trend has been noticeable in the finance industry as well, where clients are seeking advanced services, smoother and faster transactions, with the risk of fraud being minimised. This subsection will look into the many ways consumers have benefited from the introduction of AI in finance, while also looking into the ways they have experienced drawbacks.

- Firstly, AI has led to improvement in customer service. The finance industry is a service sector business and customer service is extremely crucial in gaining a competitive advantage. Therefore, AI has allowed customers to speak to virtual AI assistants or "computer generated bots" , with voice response systems, allowing them to self service without the need to interact with a sales individual that may have self interests . Interestingly, some chatbots can even detect when individuals are being frustrated and immediately transfer the line to a human representative.
- Alternatively, AI also aids in fraud detection and minimisation for a business. AI can help analyse a variety of data transactions and identify fraudulent,anomalous transactions from them. These are fraud prevention methods that help enhance financial security.
- One of the main expenses for any business model is labour costs - the compensation,bonuses, benefits paid to labour and employees for their efforts. One major introduction in the finance sector has been decision management systems( DMS). These systems combine data analytics, business objectives, AI, Machine learning and provide real time recommendations. Increasingly, AI has been replacing the need of human relationship managers. Clients fill out an online form and the answers determine the account that's suitable for them, leading to faster customer onboarding while also reducing the need to employ workers. DMS systems also reduce the risk of human error as it ensures the data entered in the system are credible and consistent. Human error in financial systems can often lead to heavy government fines or a loss in brand image for businesses, especially in the financial sector, where the security of their money may be questioned by clients if a significant error occurs in their systems. For example, Government regulators slammed a \$135.6m fine on Citibank in July 2024, due to the bank being unable to resolve "longstanding internal control issues ". The Fed, which is the United state of America's central bank, released a statement which said that this bank had failed to meet its obligations under a 2020 consent order. This fine was on top of a \$400m fine it was charged in 2020 under the initial consent order. This is one of the major examples of how errors in the systems of major financial institutions can lead to government fines which affect them adversely.



The drawbacks of introducing AI in finance are as follows :

- The primary drawback of AI is the cost. As AI machines are often highly complex and technical to produce, they are even more expensive for a business to purchase and maintain. Similarly, these AI machines in the financial sectors often require highly advanced software that may often need to be updated with the changing dynamic business environment. In a situation where the data is lost, the recovery of data may cause a lot of money and add to the business expenses which can hamper their operating profits.
- A section of finance which AI has failed to replace is conventional decision making. Decisions are still taken in most organisations based on human intuitions, experience and ethical considerations which AI fails to take into account. A decision affects several different stakeholders, from employees and managers to customers, suppliers and the local community. Therefore, human leaders often consider the likely impact from a broader point of view which AI fails to cover. End of the day, AI is an algorithm and operates completely on logic and data, while a human leader may assess emotional and ethical factors of decision making which aid in the correct decision being taken.
- Reducing unemployment is one of the macroeconomic objectives for any government in their economy. The use of technology in the form of AI and chatbots. AI automates routine, clerical, everyday tasks such as data entries, fraud detection and portfolio management. One of the primary jobs of an accountant is to perform bookkeeping- which records the day to day transactions of a business. However, increasingly, accounting softwares that uses robots has replaced these workers and has led to widespread unemployment. This is represented below:
- This is a production possibility curve and it represents how unemployment has now led to lower quantities of both goods being produced in an economy. This diagram simplifies the explanation of how unemployment caused by the use of artificial intelligence can lead to inefficiency in an economy.



**How is AI shaping the future of finance?**

Artificial intelligence has several positive impacts on this industry and has led to a transformation of how financial services are delivered to the customer. It aids in customer personalisation as AI involves apps which track your spending and help determine the best investment or saving scheme. AI helps in detecting frauds and suspicious activity, automate day to day repetitive tasks such as ratio calculation and finally assess risk. These are just some of the various ways in which AI aids the banks and finance organisations. According to Moody's Investor Service study, it is shown that 18% of fintech companies in India have already adopted AI services, as compared to an average of 9% across all other sectors. A recent Teamlease Digital study also suggests that AI adoption across critical sectors has reached nearly 48% in FY 24, with projections indicating a further increase of 5-7% in FY 25.

Another critical fact is that by FY 2027, AI in finance is predicted to be a whopping \$130 billion industry. Hence, it is further evaluated by experts that AI will in fact revolutionise the finance industry, where AI is utilised efficiently in many different ways- such as automating processes, analysing vast quantities of data and providing numerous recommendations. In terms of portfolio management, AI may become so skilled and proficient that it can make real time market predictions, and also implement trading strategies, be it the Wall Street of New York or Dalal Street of Mumbai. AI will help perform customer analysis accurately and at a pace faster than the traditional banking system of employees, which will allow for personalised services. Currently, Banks around the globe are employing ChatBots for customer services, but these technologies are expected to become more advanced and exhibit human-like characteristics and presence. The role of AI in Loan application and fraud detection purposes have already been evaluated and will be critical in the further growth of this industry.

Experts stress that although AI offers significant advantages in terms of efficiency, data-driven insights, and innovation, maintaining human involvement in the financial sector is crucial. This is because human judgement, ethical considerations, and emotional intelligence play essential roles that AI alone fails to replicate. The systems must be such that AI and employees are complementary to each other, rather than mere substitutes. Such systems can leverage AI's analytical power while relying on human intuition and ethical reasoning for decision-making. This human-AI collaboration has the potential to enhance decision quality, foster trust, and ensure that financial solutions remain adaptive and responsible as the industry continues to be dynamic in nature.

**Future of Human jobs and employment in AI driven finance companies**

The job market remains no exception when we talk about the influence of AI across various domains. Repetitive tasks such as data entry, transaction processing and customer service inquiries are being performed more efficiently by AI algorithms, leading to efficiency and cost savings for financial institutions. Although beneficial for the firms, this can lead to loss of jobs for those who are employed in repetitive mundane tasks. For example, roles like data analysts, back-office support staff, and some customer service positions may see a decline in demand as AI takes over these functions. However, some roles in a business such as strategic decision making, complex problem solving and customer relationship management( CRM), rely on human judgement and intuition and therefore cannot be easily replaced by AI in the near future.

Although some finance roles may be replaced, AI can sometimes be of use to existing workers in a bank. It can lead to the emergence of hybrid roles, where employees and AI systems work alongside to enhance productivity. Financial advisors in an asset management company may use AI systems to provide clients with optimal investment opportunities, while also providing their personal guidance and basing this relationship on human trust, hence building customer value. Other ways that AI can compliment employees is in legal services, where an AI system can analyse vast quantities of company data and compare it with the legal rules and legislation that govern the company. It can guide the accountants and auditors about possible discrepancies in data and help them take remedial action.

AI performing repetitive mundane tasks faster and more efficiently may not always be disadvantageous to employees. The existing employees such as senior level managers can instead use the time saved to focus on corporate planning for the business, and other important tasks rather than spending their time on the repetitive tasks. This can lead to efficient operations of the business as a whole. Therefore, AI can take care of routine tasks, allowing finance leaders to use their emotional intelligence and human touch in dealing with clients.

Lastly, AI also creates new job opportunities and shifts the nature of work in the finance industry. As AI systems become more integrated, there is a growing need for professionals with skills in AI development and Machine

Learning. Employees who have the capability to oversee and manage AI systems can enjoy better career prospects and employment opportunities.

While AI has made significant strides in automating many routine and repetitive tasks in the finance industry, there are certain roles that require a unique blend of financial acumen and human judgement. Some of these jobs include-

1) Investment Banking-which involves assessing the market conditions and negotiating the best deal possible for their clients.

2) Financial advisors- They require ability to build personal relationships, understand human emotions and provide ethical judgements- to provide tailored and personalised services to their clients.

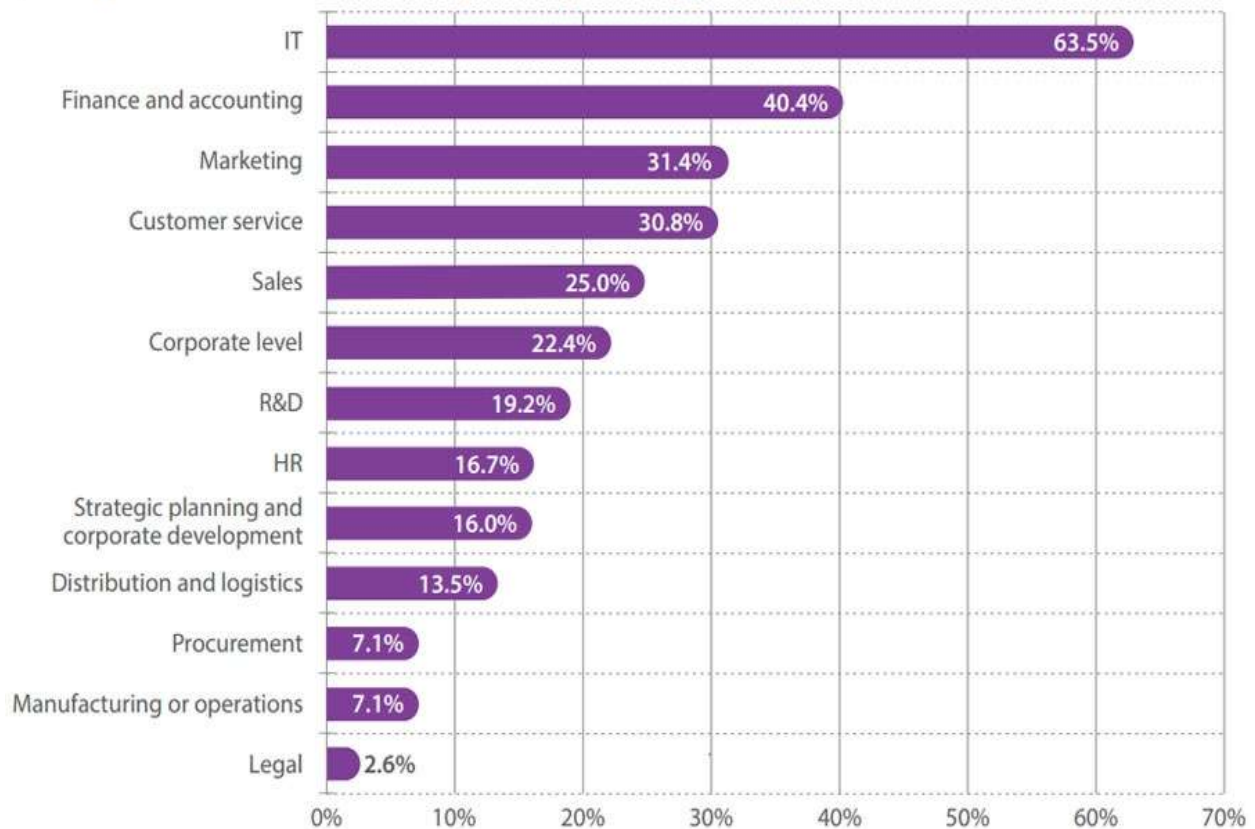
In the long run, the impact of AI on employment in the finance sector will be determined by how effectively organizations and employees adapt to the evolving technological environment. Workers equipping themselves into reskilling programmes will help them keep up with the demands of the labour market and adapt to new roles, enabling them to collaborate effectively with AI systems. Approximately 40% of global jobs are vulnerable to AI, but in advanced economies, up to 60% of positions could be impacted, particularly those requiring high skills.

### Statistics related to the research

The diagram below shows how IT is the department in the business where most banks have incorporated the use of AI, with finance and accounting being second. As discussed earlier, AI enhances data protection and automates processes which is the reason IT is the department that significantly uses most AI. As AI helps improve operative efficiency, it is in a finance company's best interest to adopt AI practices in their IT and finance departments. The legal department is the smallest share of the departments using AI services. The reason for this is the fact that this department uses nuanced human judgements about government laws and business performance. There is very little scope of error as it can lead to damaged brand image for a bank hence often a human manager is placed to interpret the laws that govern the business, and take ethical considerations into account, which AI often fails to do.

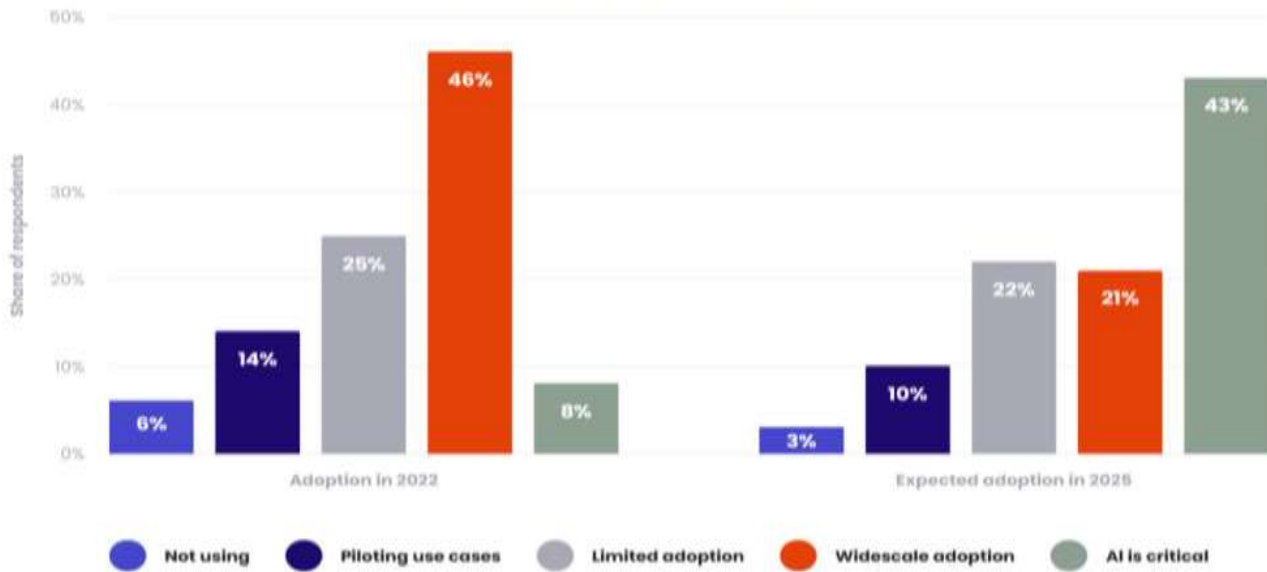
### Where Banks are Using AI

(Banking and Financial Services): Percentage of Companies Using AI Today In Each Function



The diagram below is a very important indicator of how the use of AI is becoming more widely recognised and established by finance companies. It is shown that the companies not using AI have halved from 2022 to the estimated use in 2025, while the limited adoption and piloting use cases have also fallen. On the other hand, AI being a critical bar, which shows how many financial businesses feel that AI is now necessary in their operations and business model, has more than doubled from 8% to 43% , indicating the adoption worldwide of AI. Perhaps, the overall view is that the businesses are moving from “widespread adoption” of AI to an “AI is critical” approach by FY 2025, and it is projected to only further grow from here, keeping the advantages of AI in mind.

### Artificial intelligence (AI) adoption rate in financial businesses worldwide in 2022 and 2025



Another critical fact is that by FY 2027, AI in finance is predicted to be a whopping **\$130 billion** industry.

More statistics by Moody's Investor Service and Teamlease Digital Service, have been provided in the section - how is AI shaping the future of finance, with the relevant source of information provided in the appendix.

A recent Citi report reveals that 54% of jobs in the banking sector have a high potential for automation, while an additional 12% could be enhanced by AI. They expressed- “AI may be adopted faster by digitally native, cloud-based firms, such as FinTechs and BigTechs, with agile incumbent banks following fast. Many incumbents, weighed down by tech and culture debt, could lag in AI adoption, losing market share.”

“Since AI models are known to hallucinate and create information that does not exist, organizations run the risk of AI chatbots going fully autonomous and negatively affecting the business financially or its reputation,” Citi said.

#### Long term impact of AI on the finance industry

AI is a branch of computer science which focuses on developing machines and algorithms that are capable of performing tasks and have human-like characteristics. The long term impact of AI on the finance industry is revolutionary in nature, and will continue to drive efficiency, innovation and reshape the traditional methods of banking. From automating routine tasks to fraud detection and compliance monitoring, AI will do it all for the businesses in this sector and help reduce operational costs and save time. While these changes promise substantial benefits, they also come with challenges, such as the need for a transformed workforce and evolving regulatory frameworks. The long-term success of AI in finance will depend on how effectively institutions can integrate this technology while maintaining a balance between innovation and human expertise.

#### Summary of the research undertaken

The research undertaken has highlighted both opportunities and challenges that are examined from the increasing use of AI in the finance industry. The paper analyses how AI automates routine tasks, detects fraud, enhances risk



management, and identifies potential risks more accurately than many human employees. Additionally, AI enables personalized financial services, offering tailored recommendations and improving customer satisfaction.

The paper also talks about how AI machines and systems are expensive and costly to implement for many businesses, how AI has been unable to replace conventional decision making methods and how human involvement will always be required in most of the sectors of any finance business which reduces the usefulness of AI. The paper also highlights how one key concern is job displacement, as automation reduces the demand for roles involving routine tasks, potentially leading to workforce downsizing. Lastly, over-reliance on AI may reduce human judgment in complex financial decisions, limiting the ability to address nuanced, client-specific needs. The research paper also mentions several statistics and facts from trusted sources which help complement the full study of the topic. Furthermore, the long term impact of AI is examined in both the finance industry, and the employment in the finance industry in particular. The study also addresses the need for reskilling programs as AI reshapes the workforce, with certain jobs being automated and new roles emerging. The paper concludes that AI's success in finance will depend on its responsible integration with human expertise to ensure ethical decision-making, transparency, and risk management.

### **Final judgement and Personal Opinion on whether the use of AI in the finance industry is substantial**

The research paper provides a very transformative view on the use of AI on the finance industry, as it is poised to enhance risk management, revolutionise operations, and enable new and efficient business models. Alternatively, the research paper also looks at importance of balancing AI's capabilities with human judgement, in order to fully complement the use of AI and ensure the ethical use and the use of human intelligence in decision making.

### **Personal Opinion**

I believe AI's potential in finance is immense, but its success will depend on thoughtful implementation. While AI can handle data-driven tasks efficiently, it cannot replace the human elements of ethical decision-making, trust-building, and personalised client relationships. A hybrid model, where AI complements human expertise, is therefore crucial for achieving sustainable progress in the finance industry.

Ultimately, AI can unlock new opportunities, but only if it enhances—rather than replaces—the human touch in finance.



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