Proceedings of ICEMGD 2024 Workshop: Innovative Strategies in Microeconomic Business Management
DOI: 10.54254/2754-1169/115/2024BJ0188

The Impact of AI on the Development of Manufacturing, Logistics, and Financial Company from Capital Market Perspectives

Yibo Kan[1,a,*]

[1]*Institute of Warwick Business School, Warwick University, Coventry, United Kingdom*
a. Yibo.Kan@warwick.ac.uk
**corresponding author*

Abstract: This paper explores the impact of AI technology on enterprises, especially in finance and capital markets. With the rapid development of AI technology, enterprises hope to improve productivity, financial management, and market competitiveness through AI, and ultimately achieve sustainable development. The article aims to analyze the application cases of AI in head enterprises and their effects and put forward corresponding suggestions and insights. By analyzing case studies of enterprises such as Tesla, Amazon and JP Morgan, it elaborates on the application of AI in various areas such as enterprise manufacturing, supply chain management, automated trading, risk management and customer service. It reveals the great potential of AI in improving enterprise operational efficiency, reducing costs and optimizing decision-making. By analyzing the above cases, it is suggested that enterprises should strengthen data privacy and security management and improve technology transparency and interpretability when introducing AI technology. The study reveals that AI technology has potential but also faces challenges, and enterprises need to keep overcoming obstacles to achieve the wide application and deep integration of AI technology.

Keywords: AI, Manufacturing, Logistics, Financial Company, Capital Market.

1. Introduction

With the rapid progress of Artificial Intelligence (AI) technology, it has now become an important driving force for enterprise innovation and development. The application of AI technology is gradually expanding in business management, operations, finance, and capital markets, demonstrating its immeasurable potential in the future. In today's information age, using AI to improve productivity, better control of finances, and enhance market competitiveness has become a new goal for companies, all of which ultimately lead to sustainable development. Especially in finance and capital markets, AI is profoundly reshaping how companies operate and make strategic choices. Traditional financial methods and market analyses are no longer sufficient to cope with this fast-changing business world. Companies are using big data analytics, machine learning, and automated processes to respond to change and make decisions more accurate and efficient. This transformation not only improves internal controls but also adds confidence and stability to the capital markets.

DOI: 10.54254/2754-1169/115/2024BJ0188

In recent years, there has been a gradual increase in research on the impact of AI on business development. Studies have shown that AI technology has significant advantages in financial management. For example, AI can help enterprises carry out financial forecasting, risk management and internal auditing through big data analysis and machine learning algorithms, to improve the accuracy and efficiency of financial decision-making [1]. In addition, AI has been widely used in the capital market, including areas such as stock trading, portfolio management and market forecasting [2].

Specifically, the application of AI in financial management includes automated processing and analysis of financial data. Through AI technology, enterprises can achieve automated collection, classification and analysis of financial data, thus reducing the error rate and workload of manual operation [3]. And AI can also predict the future financial situation through the deep learning model of historical data, providing a scientific basis for the financial planning of enterprises [4].

In the capital market, the application of AI is more extensive and in-depth, AI technology can achieve automated trading through high-frequency trading algorithms, which not only improves the efficiency of trading but also reduces the interference of human factors on the market [5]. In addition, AI can help investors make more informed decisions by analyzing massive market data and predicting market trends and risks. For example, machine learning algorithms can predict short-term fluctuations in stock prices by analyzing historical price data, news reports and social media information [6].

However, the application of AI technology also brings new challenges and risks. Enterprises need to consider data privacy, security, and technical ethics when introducing AI technology [7]. AI technology is prone to data leakage and privacy invasion in the process of processing and storing large amounts of data. Also, the transparency and interpretability of the AI decision-making process is an important technical ethical issues, and companies need to ensure that the decision-making process of the AI system is open and transparent in order to increase the trust of users [8].

In addition to this, the complexity and high cost of AI technology also pose a barrier to its application in SMEs [9]. Compared with large enterprises, SMEs' disadvantages in financial and technical resources make them face more difficulties in introducing and applying AI technologies. Therefore, SMEs may need to rely more on external technical support and partners when introducing AI technologies to reduce costs and technical difficulties.

The purpose of this paper is to explore the impact of AI technology on enterprise development, especially from the perspectives of finance and capital market, to analyse the application cases of AI in head enterprises and their effects, and to put forward corresponding suggestions and insights. By analyzing the case studies of enterprises such as Tesla, Amazon and JP Morgan, we hope to reveal the advantages and challenges of AI technology in practical application and provide valuable references and lessons for other enterprises.

2. Progress and Cases, Journey of AI Adoption by Leading Companies

2.1. Tesla

Tesla has made significant progress in the adoption of AI technology, especially in manufacturing and production optimization. By introducing advanced AI technologies, Tesla has achieved a high degree of automation and intelligent management in its production lines, significantly improving production efficiency and product quality. For example, Tesla's production line employs machine learning algorithms and computer vision technology to monitor every aspect of the production process in real-time. By analyzing a large amount of production data, these algorithms can quickly detect deviations and faults in production and make timely corrections, thus ensuring the smooth running of the production process. Specifically, Tesla has deployed a large number of sensors and cameras in the production process, and the data collected by these devices can be analyzed in real-time through

DOI: 10.54254/2754-1169/115/2024BJ0188

machine learning models. This real-time monitoring and analysis can not only identify problems in production but also predict potential failures so that preventive measures can be taken before problems occur.

On the capital markets front, after Tesla's chief CEO Elon Musk visited China in April, Chinese authorities gave preliminary approval to Austin, Texas-based Tesla Inc.'s plan to roll out its Fully Self-Driving (FSD) technology in China. The launch of this technology hinges on a new agreement signed between Tesla and Chinese tech giant Baidu, as well as Tesla's efforts to meet its requirements for dealing with data security and privacy issues [10]. Tesla has overcome a major hurdle in its goal of launching driver-assistance technology to the world's largest car market. Another major leap in AI self-driving technology has led to a substantial increase in Tesla's share price, and in today's market, where artificial intelligence is at the center of attention, the company's advancements in AI would be considered a very promising growth area.

2.2. Amazon

Amazon uses AI technology extensively in supply chain management and customer service. Through AI-driven demand forecasting and inventory management, Amazon has significantly improved operational efficiency and reduced costs. For example, Amazon uses machine learning algorithms to analyze historical sales data and market trends to forecast future product demand, thereby optimizing inventory management and reducing inventory backlogs and stock-outs [11]. Notably, Amazon's AI customer service system also performs very well when interfacing with customers, providing efficient and professional services through natural language processing and machine learning, enhancing customer satisfaction and loyalty [12].

On the capital markets side, Amazon leverages AI technology to optimize its investment and financial decisions. By introducing advanced AI algorithmic models, Amazon's investment department is able to analyze market data and companies' financials in greater depth to make more accurate and informed investment decisions. Amazon's AI system collects and processes massive amounts of market data, including stock prices, trading volumes, economic indicators and news reports, etc., and conducts in-depth analyses through AI algorithmic models, which are capable of identifying potential trends and opportunities in the market and helping the investment team identify investment targets with high growth potential [13]. In terms of financial management, Amazon also uses AI technology to carry out comprehensive optimization. The introduction of AI technology makes the process of generating and analyzing financial statements highly automated. The generation of traditional financial statements requires a lot of manual work and review, which is time-consuming and has a very high error rate. However, Amazon automates this process through AI technology, which significantly improves the efficiency and accuracy of financial statement generation. The AI system can automatically collect and organize all kinds of financial data to generate all kinds of financial statements, including balance sheets, income statements and cash flow statements, to ensure the timeliness and accuracy of the data.

2.3. JP Morgan

JP Morgan is an example of the application of AI technology in the financial sector. Algorithms control micro-level trading in financial operations, such as stock and electronic futures contracts, where algorithms determine the band, price, and volume of trades. The complexity of the data contained in the trading order book makes writing electronic trading algorithms a maddening and complex task, and manually written trading algorithms tend to be large and unwieldy. jp Morgan has developed an AI system, "LOXM", to automate stock trading, which significantly improves trading efficiency and profitability through high-speed data analysis and algorithmic trading. Through high-

DOI: 10.54254/2754-1169/115/2024BJ0188

speed data analysis and algorithmic trading, it significantly improves the efficiency and profitability of trading. At the same time, JP Morgan also uses AI technology for risk management and compliance monitoring, reducing operational risks and compliance costs [14]. For example, JP Morgan's "JPM Coin" platform uses machine learning technology to automate the processing and analysis of legal documents and contracts, which greatly improves the efficiency of legal compliance work, and with JP Morgan's solid balance sheet, expertise in blockchain and global payment networks, JP Morgan can rely on the Coin platform to seamlessly and securely serve its global clients. platform to seamlessly and securely transfer and settle funds for its global customers [15].

Many firms are still in the early stages of evaluating AI, with compliance and fraud processes being prominent areas that gain immediate attention. JPMorgan Chase has been using large-scale language models powered by underlying AI for payment verification screening for more than two years. It is also speeding up processing by reducing false positives and implementing better queue management. The result has been lower fraud rates, a better customer experience, and a 15-20% reduction in account verification denials [16]. JP Morgan is also optimizing its customer service and market analytics through AI technology. For example, JP Morgan uses natural language processing to analyze customer feedback and market commentary to provide personalized financial services and investment advice. This not only improves customer satisfaction but also enhances customer loyalty and market competitiveness [17].

3. Bottlenecks

Although AI technology brings many benefits to enterprises, it also comes with some losses and potential risks. The first one is the problem of data privacy and security risk. the AI system needs to deal with a large amount of enterprise and user data, and the leakage of these data may bring serious reputational and economic losses to the enterprise, and the enterprise may be subjected to huge fines and lawsuits due to data leakage from the AI system [18]. The second is that the decision-making process of AI algorithms may sometimes be affected by data bias and algorithmic flaws, leading to the generation of erroneous decisions, which may bring potential economic losses to enterprises [18]. On the other side of the coin, the current use of AI technologies may also raise ethical and legal risks. Businesses need to ensure the transparency and fairness of their AI systems to avoid social and legal issues arising from algorithmic discrimination and unfair decision-making. For example, some enterprises have been criticized by public opinion and legal actions due to algorithmic bias when using AI technology for recruitment and credit assessment, which can seriously affect their social image [19].

And, although AI technology shows great potential when applied in practice by enterprises, its promotion and application still face some bottlenecks. Firstly, the cost is too high, the promotion of AI in the enterprise is still in the early stage, the application range is very small, and the price and cost of use are very expensive, which is an unaffordable expense for most SMEs. Secondly, the technical requirements are too high, now the development and application of AI programs still need very full professional knowledge and technical skills, and programmers in SMEs may not have the means to use AI well to bring help to the enterprise [20]. In addition, the application of AI technology also faces bottlenecks in data quality and data access. AI systems require a large amount of high-quality data for training and optimization, but many enterprises have difficulties in data collection, storage and processing. In this era of data explosion, excessive spam can also seriously affect the algorithmic learning of AI. Lack of data and low quality can directly affect the performance and decision accuracy of AI systems [21].

DOI: 10.54254/2754-1169/115/2024BJ0188

4. Recommendations

In order to fully leverage the role of AI technologies in business development, enterprises need to take a series of measures to overcome the current challenges they face and maximize their advantages. Firstly, enterprises should strengthen their security management in terms of data privacy. AI systems rely on a large amount of data to train and optimize their algorithms, which usually include sensitive corporate and customer information. If data leakage occurs, it will not only seriously damage the reputation of the enterprise, but may also lead to significant legal and financial losses. As a result, organizations need to implement strict data management policies and security measures to ensure data security and compliance. This includes adopting advanced data encryption technologies, firewalls and intrusion detection systems, as well as conducting regular security audits and risk assessments.

Second, organizations need to improve the transparency and interpretability of AI technology. The decision-making process of AI algorithms is often complex and opaque, which can lead to issues such as algorithmic bias and unfair decision-making. For example, in areas such as recruitment and credit assessment, AI systems with opaque decision-making bases may produce discriminatory results, which can lead to legal and social problems. Enterprises should therefore aim to develop and adopt explainable AI models that ensure that algorithmic decision-making processes are transparent and reviewable. Enterprises should also regularly test AI systems for fairness and bias and take steps to rectify any issues identified to ensure the fairness and reliability of AI systems in various application scenarios.

For SMEs, there may be limitations in applying AI technology in terms of capital and technical capabilities. Therefore, SMEs can reduce costs and technical difficulties by collaborating and sharing resources and technologies with external technology companies. Such collaboration can take many forms, including working with technology suppliers, joint R&D with universities and research institutes, and participation in industry consortia and innovation incubators. Through such cooperation, SMEs can gain access to advanced AI technologies and solutions to make up for their own shortcomings in technology development and implementation capabilities.

5. Conclusion

This paper explores the impact of AI technology on enterprise development, especially in terms of finance and capital markets. This paper also points out the risks and bottlenecks faced in the application of AI technology. In the future, as AI technology continues to develop and mature, the advantages of enterprises in its application will be more significant, but they also need to continuously overcome the challenges and risks faced. Overall, in order to give full play to the role of AI technologies in enterprise development, enterprises need to take a series of proactive measures in terms of data privacy and security management, technology transparency and interpretability, R&D investment and mutually beneficial cooperation. These measures will not only help enterprises overcome the current challenges they face, but also promote the wide application and deep integration of AI technology in enterprises, enhance their innovation ability and market competitiveness, and achieve sustainable development.

References

[1] *Berdiyeva, O. B., Umar, M. U. I., & Saeedi, M. S. (2023). Artificial Intelligence in Accounting and Finance: Meta-Analysis. NUST Business Review, 3(1). https://doi.org/10.37435/nbr.v3i1.29*

[2] *Yalamati, S. (2023). Artificial Intelligence influences in individual investors performance for capital gains in the stock market. International Scientific Journal for Research, 5(5), 1–24. Retrieved from https://isjr.co.in/index.php/ISJR/article/view/204*

[3] *Davenport, T. H., & Ronanki, R. (2018). Artificial intelligence for the real world. Harvard Business Review, 96(1), 108-116.*

[4] *Loisel, S., Piette, P., & Tsai, C.-H. J. (2021). APPLYING ECONOMIC MEASURES TO LAPSE RISK MANAGEMENT WITH MACHINE LEARNING APPROACHES. ASTIN Bulletin, 51(3), 839–871. doi:10.1017/asb. 2021.10*

[5] *Aldridge, I., & Krawciw, S. (2017). Real-time risk: What investors should know about FinTech, high-frequency trading, and flash crashes. John Wiley & Sons.*

[6] *Henrique, B. M., Sobreiro, V. A., & Kimura, H. (2018). Stock price prediction using support vector regression on daily and up to the minute prices. The Journal of Finance and Data Science, 4(3), 183–201. https://doi.org/10.1016/ J.JFDS.2018.04.003*

[7] *Mittelstadt, B. (2019). Principles alone cannot guarantee ethical AI. Nature machine intelligence, 1(11), 501-507.*

[8] *Doshi-Velez, F., & Kim, B. (2017). Towards a rigorous science of interpretable machine learning. arXiv preprint arXiv:1702.08608.*

[9] *Kumar, M., Raut, R. D., Mangla, S. K., Ferraris, A., & Choubey, V. K. (2022). The adoption of artificial intelligence powered workforce management for effective revenue growth of micro, small, and medium scale enterprises (MSMEs). Production Planning & Control, 1–17. https://doi.org/10.1080/09537287.2022.2131620*

[10] *William, Gavin. (2024, April). Tesla stock is soaring after Elon Musk came back from China with a big win on Full Self-Driving. Quartz. Retrived from: https://qz.com/tesla-stock-elon-musk-china-full-self-driving-autopilot-1851441884*

[11] *Liberty, E., Karnin, Z., Xiang, B., Rouesnel, L., Coskun, B., Nallapati, R., ... & Smola, A. (2020, June). Elastic machine learning algorithms in amazon sagemaker. In Proceedings of the 2020 ACM SIGMOD International Conference on Management of Data (pp. 731-737).*

[12] *Lorne, F. T., & Gogireddy, M. R. (2021, March). Digital social contracts with AI robots: some implications for Amazon. Com. In European, Asian, Middle Eastern, North African Conference on Management & Information Systems (pp. 78-89). Cham: Springer International Publishing.*

[13] *Guha, A., Grewal, D., Kopalle, P. K., Haenlein, M., Schneider, M. J., Jung, H., Moustafa, R., Hegde, D. R., & Hawkins, G. (2021). How artificial intelligence will affect the future of retailing. Journal of Retailing, 97(1), 28–41. https://doi.org/10.1016/J.JRETAI.2021.01.005*

[14] *Kumari, B., Kaur, J., & Swami, S. (2021). System dynamics approach for adoption of artificial intelligence in finance. In Advances in Systems Engineering: Select Proceedings of NSC 2019 (pp. 555-575). Springer Singapore.*

[15] *Elhaoussine, Y., Ma, Y., & Hu, Y. (2023). Reflection on the Latent Role of Institutional Trust for the Adoption of Cryptocurrencies: Cases on Bitcoin, JP Morgan Coin, Diem, and Japanese Listed Cryptocurrencies. In Blockchain Applications in Cryptocurrency for Technological Evolution (pp. 213-225). IGI Global.*

[16] *Malhotra, Y. (2018). The CFA Society Keynote: Advancing Hedge Funds Chief Investment Officer Practices: Model Risk Management with Auto Machine Learning: JP Morgan and Goldman Sachs Practices Case Studies. (Presentation: 107 slides).*

[17] *Sestino, A., & De Mauro, A. (2021). Leveraging Artificial Intelligence in Business: Implications, Applications and Methods. Technology Analysis & Strategic Management, 34(1), 16–29. https://doi.org/10.1080/09537325.2021. 1883583*

[18] *Badghish S, Soomro YA. Artificial Intelligence Adoption by SMEs to Achieve Sustainable Business Performance: Application of Technology–Organization–Environment Framework. Sustainability. 2024; 16(5):1864. https://doi. org/10.3390/su16051864*

[19] *Bankins, S., Formosa, P. The Ethical Implications of Artificial Intelligence (AI) For Meaningful Work. J Bus Ethics 185, 725–740 (2023). https://doi.org/10.1007/s10551-023-05339-7*

[20] *Hansen, E. B., & Bøgh, S. (2021). Artificial intelligence and internet of things in small and medium-sized enterprises: A survey. Journal of Manufacturing Systems, 58, 362-372.*

[21] *Choudhuri, K. B. R., & Mangrulkar, R. S. (2021). Data Acquisition and Preparation for Artificial Intelligence and Machine Learning Applications. In Design of Intelligent Applications Using Machine Learning and Deep Learning Techniques (pp. 1-11). Chapman and Hall/CRC.*