

The Impact of AI Development on the Future Development of Financial Industry

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Abstract. In the information age of the 21st century, the rapid development and widespread application of artificial intelligence (AI) technology is profoundly changing the way we live and work, especially in the financial industry. This paper aims to define AI technology and its fundamental applications in the current financial industry, and explore its potential impact on the future development of the financial industry. The introduction of AI technology not only optimizes the operational efficiency of financial institutions and reduces operational costs, but also opens new avenues for personalization and innovation in financial services. However, all this progress comes with challenges such as data security, privacy protection, regulatory compliance, and ethical responsibility. Studying the impact of AI on the financial industry can provide a reference for financial institutions to make decisions on technological innovation and business development, and provides a basis for policy makers to formulate relevant policies and norms.

Keywords: Artificial intelligence, financial Industry, challenges and risks.

1. Introduction

In the information age of the 21st century, the rapid development and widespread application of artificial intelligence (AI) technology is profoundly changing the way we live and work. Especially in the financial industry, AI technology has become a key factor in driving innovation, improving efficiency and service quality [1,2]. From automated trading algorithms to intelligent risk management systems to personalized recommendations for customer service, the application of AI covers all aspects of the financial industry. Therefore, in-depth discussion of the impact of AI development on the future financial industry is not only of important practical significance for financial institutions and practitioners, but also has important reference value for policy makers and consumers.

This paper aims to define AI technology and its fundamental applications in the current financial industry, and explore its potential impact on the future development of the financial industry. We will analyze how AI technology can improve the overall efficiency and service level of the financial industry through automated trading, risk management, customer service, and more. This article will also explore the challenges and risks posed by the increasing use of AI technology in the financial industry, including data security and privacy protection, regulatory compliance issues, and ethical and accountability issues. Through a comprehensive analysis of the application of AI in the financial industry, this paper aims to provide readers with a basis for determining relevant policies and regulations. The profound insight into the development trend of the financial industry provides a reference for financial institutions to make decisions on technological innovation and business development, and provides a basis for policy makers to formulate relevant policies and norms.

2. History and Development of AI in the Financial Industry

The development of artificial intelligence (AI) technology in finance dates back decades, but its true impact has mostly come in the past few years. Over the past few decades, the financial industry has been looking for ways to improve efficiency, reduce costs, and deliver a better customer experience, and the rise of AI technology has opened up new opportunities and possibilities to achieve these goals.

2.1. Historical Review

The early days of finance were dominated by the use of AI technology for data processing, risk management and forecasting. For example, neural networks are used to make predictions about financial markets, as well as to conduct credit assessments and fraud detection. However, these early applications were limited by computing power and data availability and often lacked sufficient accuracy and reliability.

With the improvement of computing power, the large-scale collection of data, and the advancement of machine learning algorithms, the application of AI in the financial industry has gradually expanded and deepened. From rule-based systems to data-driven machine learning models, the development of AI technology has led to more flexible and precise solutions for the financial industry. Rebellion, the world's first artificial intelligence-driven fund, had accurately predicted the financial risks of 2008 and signaled the possibility of a stock market crash that year. The following year, the robot gave Greece's securities the lowest rating in history, a full month ahead of Fitch, which is known for its authority.

2.2. Current Use Case

At present, the application of AI technology in the financial industry has been very extensive [3]. Some typical applications include the following examples.

2.2.1. Risk management

Risk prevention is the vocation and core responsibility of financial institutions. As intermediaries of funds, financial institutions are exposed to various types of risks, such as credit risk, market risk, management risk, liquidity risk, legal and compliance risk, and so on. In the face of risk, financial institutions must first establish a sound internal control and risk management system, and establish a sound risk management framework to categorize, assess and manage various types of risk. In this process, AI technology is used to predict trends in financial markets, assess borrowers' credit risk, and detect fraud. By analyzing large amounts of data and real-time market conditions, AI systems can provide more accurate and timely risk warnings and help financial institutions better manage risks.

2.2.2. Trade execution

AI and machine learning tools are used to identify new signals of price movement and leverage the vast amount of available data and market research that is more effective than existing models to predict price levels or volatility over different periods, resulting in higher "uncorrelated" returns. At the same time, asset managers are also applying AI to quantitative funds, most of which are hedge funds. Specialized firms also provide AI tools to asset managers to derive valuable leads from a wealth of news and market research. Automated trading systems utilize AI algorithms for high-frequency trading in order to gain profits and optimize trade execution. These systems are able to execute trades in milliseconds and adjust in real time based on market conditions to ensure the best trade execution results.

2.2.3. Customer service

Customer service is the application scenario where AI can work and be effective most quickly. So far, all kinds of trading platforms have widely adopted robot customer service. AI technologies such as chatbots and virtual assistants are widely used in financial customer service. These systems are able to provide 24/7 service to customers and provide personalized recommendations and solutions based on customer needs and preferences. But on the whole, the effect is not ideal. The reason for this is that robot customer service lacks the ability to sense the thousands of different language expressions of customers, lacks empathy for customer needs, and is not broad in knowledge. Judging from the performance of ChatGPT, high-level artificial intelligence is likely to be more experienced than artificial customer service, broader knowledge and faster reaction speed. It can be expected that in the near future, artificial customer service will be completely replaced by intelligent robots, the

number of customer service jobs will be sharply reduced, and the huge customer service workplace will no longer exist, thus largely reducing the financial institutions' labor costs and management costs.

With the continuous development of AI technology and the continuous expansion of application scenarios, the financial industry will further improve efficiency, reduce risk and improve customer experience. However, the application of AI technology also faces some challenges and risks, such as data security and privacy protection, regulatory compliance, and ethical and liability issues. In the future, the financial industry needs to continue to explore how to fully leverage the benefits of AI technology while effectively addressing the associated challenges and risks to achieve sustainable development and innovation.

3. The Impact of AI Technology on the Financial Industry

In recent years, the rapid development of AI technology has brought seismic changes to several industries, with the financial industry being one of the most profoundly affected. Through automation, data analytics, and machine learning, AI technology has greatly improved the efficiency, safety, and customer satisfaction of financial services. The purpose of this article is to explore the impact of AI technology on the financial industry in three areas: automation and efficiency improvement, risk management, and customer service.

3.1. Automation

AI technology significantly improves work efficiency and accuracy by automating complex financial processes. For example, intelligent algorithms are able to automate transactions, report generation, and audit processes, tasks that require a lot of manpower and time without the help of AI.

3.2. Efficiency Improvement

More than just automating processes, AI technology further improves the overall efficiency of the financial industry by optimizing the decision-making process, reducing errors and delays, and increasing processing speed. For example, in the field of investment management, AI analyzes a large amount of historical data to predict market trends and help investors make more accurate investment decisions.

3.3. Risk Management

Using machine learning and big data analytics, AI technology can effectively predict trends in financial markets. By analyzing historical data and real-time market information, AI can help financial institutions grasp investment opportunities and reduce potential risks in an unpredictable market. AI technology also shows great potential in credit assessment and fraud detection. By analyzing customers' transaction history, spending behavior, and social network data, AI can more accurately assess the credit rating of an individual or business, reducing the incidence of financial fraud incidents.

3.4. Customer Service

The potential of AI to reduce costs, capture risk management gains, increase productivity and thus enhance profitability has prompted financial institutions to use it to meet their business needs. According to Finextra and Intel, the priorities for its use in the financial sector are: optimizing the customer service process, creating interactions between systems and people applying AI to enhance decision-making, and developing new products and services [4]. AI technology has greatly improved the customer service experience through intelligent customer service robots and personalized recommendation systems. These AI systems are capable of providing 24/7 service, quickly responding to customer queries, while providing personalized financial products and service recommendations by analyzing customer data. AI technology makes financial services more personalized, enabling the delivery of customized services based on the specific needs and

preferences of customers. This not only improves customer satisfaction, but also creates more opportunities for value-added services for financial institutions.

In a word, the impact of AI technology on the financial industry is profound and comprehensive. By automating processes, enhancing risk management capabilities and enhancing the customer service experience, AI is reshaping the future of the financial industry. With the further development and application of the technology, AI is expected to play a greater role in the financial industry, bringing more innovation and change.

4. The Challenges and Risks of AI in the Financial Industry

4.1. The Potential Challenges of AI in the Financial Industry

4.1.1. Industry structure change

The application of AI will accelerate the digital transformation of financial services and facilitate the rise of new fintech companies. This may lead to a reshaping of the competitive landscape of the market, and traditional financial institutions need to adapt to the new technological environment and strengthen cooperation with technology enterprises in order to remain competitive [5]. Fintech has been widely used and rapidly developed in recent years, and has profoundly changed the finance industry, including the internal logic of finance and the behavior of the financial workplace. And big data, blockchain, AI, Internet of Things and so on are supposed to be the main components of fintech. With the improvement of artificial intelligence technology, fintech will definitely have a broader and deeper impact on the financial industry.

4.1.2. Employment impact

While the application of AI may lead to the reduction of certain jobs, especially those with high repetitive tasks such as data entry and simple customer service, it will also create new jobs [6]. These new roles will require higher-level skills, such as the design, development and maintenance of AI systems, as well as data analysis and interpretation.

The future development of AI in the financial sector not only heralds technological advances, but also marks a profound impact on the industry structure and employment landscape. Financial institutions, practitioners, and policymakers need to work together to ensure that technological advances deliver positive socio-economic benefits while mitigating potential negative impacts.

4.2. The Potential Risks of AI in the Financial Industry

4.2.1. Data security and privacy

The increasing use of artificial intelligence (AI) technology in the financial industry has led to significant improvements in efficiency and convenience. However, this technological advancement also comes with data security and privacy protection challenges [7]. Financial institutions rely on vast amounts of sensitive information, including personal financial data and transaction records, to provide services and make decisions. AI systems analyze this data to improve service quality, predict market trends, and even prevent fraud. However, this also puts this sensitive data at risk of illegal access and misuse. Therefore, it is crucial to ensure that strong data encryption and privacy protection measures are in place when using AI technology to process big data.

4.2.2. Regulatory compliance

As the application of AI in financial services continues to deepen, regulatory compliance becomes another major challenge that financial institutions must face. Different countries and regions have different regulatory policies for financial services, and financial institutions must ensure that their operations and services fully comply with local laws and regulations when applying AI technology. This includes data protection laws, consumer protection laws and regulations for specific financial products. However, the complexity and automated nature of AI systems makes it more difficult to comply with these regulations, especially when operating across borders. As a result, financial

institutions need to constantly update their compliance strategies to ensure that their AI systems can adapt to the changing legal landscape.

4.2.3. Questions of morality and responsibility

The use of AI in financial decision-making raises a number of ethical and liability issues [8]. The decision-making process of AI systems often operates in a black box and is based on opaque decisions, raising widespread concerns about fairness, transparency, and accountability. For example, when using AI for credit assessments, algorithms that are biased can result in some groups being treated unfairly. In addition, determining responsibility becomes complicated when decisions made by AI systems result in financial losses or other negative consequences. This includes not only technical challenges, but also legal and ethical issues. Therefore, when developing and deploying AI systems, financial institutions need to ensure that the decision-making process for these systems is both fair and transparent, while establishing appropriate accountability and accountability mechanisms.

5. The Future Direction of AI in the Financial Industry

In the future, AI should be able to utilize its powerful database, knowledge base and analytical capabilities to help the finance industry make more scientific investment decisions and improve portfolio returns and risk control.

5.1. Personalized Financial Services

AI technologies, especially machine learning and deep learning, enable financial institutions to provide highly personalized services. By analyzing large amounts of client data, financial institutions can provide customized investment advice, financial planning services and risk management solutions for each client.

5.2. Automation and Intelligent Decision Making

Advances in AI will further drive automation in the financial industry, especially in areas such as trade execution, asset management, and customer service. Intelligent algorithms can make decisions at the millisecond level, optimize trading strategies, and improve trading efficiency and profitability [9].

5.3. Risk Management and Compliance

AI offers new tools for identifying, assessing, and preventing risks. By analyzing large amounts of data in real time, AI can help financial institutions identify fraud, credit risk, and market abuse earlier. In addition, AI can help organizations comply with regulatory requirements more efficiently and reduce human error.

6. Conclusion

The rapid development and widespread application of artificial intelligence (AI) technology has caused profound changes in the financial industry. Through this discussion, we can see that AI has had a significant impact on the financial industry in terms of automating processes, improving efficiency, risk management, customer service, and more. The introduction of AI technology not only optimizes the operational efficiency of financial institutions and reduces operational costs, but also opens up new avenues for personalization and innovation in financial services. However, all this progress comes with challenges such as data security, privacy protection, regulatory compliance, and ethical responsibility.

Facing the future, the application of AI in the financial industry has a broad prospect, but it also requires the joint efforts of academia, industry and regulators to ensure the healthy development and application of the technology. Therefore, this paper puts forward the following suggestions, in order to provide reference for future research direction and practice. Firstly, strengthen interdisciplinary

research. Given that the application of AI in finance involves multiple disciplines such as computer science, finance, law, and ethics, strengthening collaborative research across disciplines will contribute to a comprehensive understanding of the potential and challenges of AI technology. Secondly, attach importance to data security and privacy protection [10]. While promoting the development of AI technology, it is necessary to strengthen the construction of laws and regulations on data protection to ensure that user data security and personal privacy are not infringed. Thirdly, promote the development of regulations and standards. With the in-depth application of AI technology in the financial field, the development of corresponding regulations and industry standards is crucial to guide and regulate the healthy development of AI technology. Fourth, greater attention to the ethics of AI. Research on the ethics and ethics of AI in decision-making should be strengthened to ensure that the application of AI technology can follow the principles of fairness, justice and transparency. Fifth, training cross-field talents. Financial institutions and educational institutions should strengthen the training of cross-field talents, especially compound talents with financial knowledge and AI technical ability, in order to meet the new needs brought by the development of AI technology.

Through these efforts, we can expect AI technology to bring more innovation and progress to the financial industry in the future, while also effectively addressing the accompanying challenges. Future research should further explore the opportunities and challenges of the application of AI technology in the financial field, so as to provide scientific guidance and strategic support for the sustainable innovation and healthy development of financial services.

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