[1]Xinrui Zhang

[2]Lu Tong*

Research on Chinese Financial Industry Application Scenarios based on ChatGPT

Abstract: - The emergence of the artificial intelligence ChatGPT has brought a huge information impact to the traditional industry, promoting the deep integration of ChatGPT and financial institutions, stimulating its innovation vitality, and comprehensively empowering financial services. This technology is the key to promote the digital intelligence transformation of the financial industry. Based on the systematic study of the integration scenario of ChatGPT and innovative application in the financial industry and related limitations, this paper constructively puts forward suggestions and expectations for the future development of the financial industry under the background of artificial intelligence, to make some innovative exploration for the application of ChatGPT in the financial industry. According to the research, ChatGPT-like artificial intelligence's powerful natural language processing, data sorting, and analysis capabilities have great application value for financial institutions covering customer service, operation, marketing, risk control, investment and budget, etc., but there are also problems such as high cost, low credibility and security, and technical limitations. Finally, this paper puts forward effective empowerment suggestions based on three aspects: government policy, institutions and technology development.

Keywords: ChatGPT, financial industry, application scenarios, digital transformation

I.   INTRODUCTION

On December 31, 2023, seventeen departments including the National Data Bureau jointly issued the three-year Action Plan of "Data Elements $\times$" (2024-2026), which proposed new progress and development in the level of financial services in terms of data elements $\times$ financial service scenarios in China. Under this situation, this act supports the application of data fusion in different fields of financial institutions. At the same time, with the advent of the digital era, the increasing economic and social human costs, and the intensification of market competition, the financial industry urgently needs to seek new ideas to reduce costs and increase efficiency. The emergence of artificial intelligence technology represented by ChatGPT provides a new opportunity for the reform and development of the financial industry. As a large-scale natural language processing model, ChatGPT's advantages are mainly reflected in semantic recognition, scalability, adaptability and human-machine interaction, which is bound to bring a huge impact on China's economic and financial industries and other related industries. Thus, it will affect a series of industrial changes in the future, contributing to the high-quality development of economy and society in China. Based on an in-depth study of ChatGPT technical characteristics and related policy background in the financial industry, this paper discusses the applicability of this technology in the financial industry, as well as the opportunities and challenges brought by it, accelerating the implementation of ChatGPT in the financial industry. Furthermore, it is also an important means to effectively promote the transformation and upgrading of digital intelligence in the financial industry.

II.   "CHATGPT + FINANCE" APPLICATION SCENARIOS

As a large-scale natural language processing tool, ChatGPT has broad application prospects and good development momentum in financial industry. With the help of semantic recognition, and human-computer interaction, ChatGPT can effectively promote the quality optimization of relevant services and operational businesses. It achieves the purpose of precision marketing through visual analysis of data, and help financial institutions better control risks and the level of accuracy of investment decisions. The integration of ChatGPT with its own business is a powerful means for financial institutions to achieve cost reduction and efficiency improvement and solve the problem of service homogenization. At the same time, the research on its landing application is also a powerful starting point for further improving the quality and efficiency of the financial industry. In the following part, this paper will discuss ChatGPT on its financial applications in the following five perspectives.

[1] Xinrui Zhang, North China University of Science and Technology, Tangshan, Hebei Province, China
[2] North China University of Science and Technology, Tangshan, Hebei Province, China
*Corresponding author: Lu Tong

A.   Customer service and operational business optimization

At present, most banks use intelligent customer service management systems, such as mobile banking, portal websites and Wechat public accounts, to open service consulting, business processing and other functions to serve the majority of users. This way can effectively solve the majority of users' simple information query needs. However, the current intelligent customer service system still faces the problems of service process formatting, simplification, and imperfect customer service function. In view of this basis, financial institutions can consider using ChatGPT's natural language analysis and processing function and customer service management system to achieve deep integration, to improve the service level of the customer service system. Additionally, with the help of mass data learning and training, financial institutions can improve the service level of the customer service system. ChatGPT can also answer questions involving multiple fields, reducing the labor cost of customer service, and can better handle complex questions and provide customers with faster and more accurate answers than traditional intelligent customer service[1]. In the practice of commercial banks, intelligent interaction of multiple AI application scenarios has been completed, such as intelligent outbound call for account reconciliation, intelligent outbound call for credit card collection, etc. Through the powerful content definition technology and intelligent interaction technology linked to ChatGPT, the outbound call business of banks can achieve a more comprehensive improvement and innovation compared with the traditional mode of outbound call business, promoting intelligent interaction and accurate interaction for sustainable development.

ChatGPT also plays a crucial role in digital operation and promotion. For example, China Merchants Bank has already tried to use artificial intelligence to automatically generate copy for credit card promotion[2]. Financial institutions can make use of ChatGPT's built-in massive text data resources and its powerful data analysis capabilities to quickly produce research and analysis reports in the analysis of competitive products, interactively optimize and upgrade financial products. Customer satisfaction can be improved constantly during this process. Additionally, ChatGPT can also be used to assist in the writing of relevant promotional documents for products and Internet operation strategy schemes, which will greatly enhance the digital operation capability of financial institutions. At the same time, ChatGPT, based on the upgrade and integration of key business lines, can improve business processes, shorten service time, make corresponding decisions based on precise analysis. Moreover, it facilitates better realizing human-computer interaction, which will play a key role in the overall operation of the financial industry and greatly improve the operational capabilities of institutions.

B.   Precision marketing

It is crucial for financial institutions to capture consumers' needs with their target consumers when making decisions in marketing campaigns. Meanwhile, ChatGPT functions in powerful data collection, analysis and learning capabilities for the purpose of satisfying consumers to a large extent. In terms of personalized service, by incorporating the analysis of customers' past account data, such as transaction records, consumption patterns, asset status, etc., institutions can build a comprehensive analysis model to achieve a comprehensive and detailed analysis of each customer and form a unique customer portrait, which can not only help financial institutions better understand customer needs but also help them better understand customer needs. It also provides strong support for tailor-made personalized financial solutions, lays a foundation for target customer selection and marketing strategy formulation, and truly reaches thousands of clients[3].

In addition, the use of ChatGPT to generate targeted advertising marketing schemes also provides the possibility for the construction of automated marketing system. At present, the financial industry is still in the marketing iteration stage of "automated marketing + data-driven", and the marketing copy is mainly formulated by expert rules, and achieved by the construction and accumulation of content templates[11].Based on ChatGPT's data analysis and natural language processing capabilities, the first step is to generate marketing content, and the following step is to generate customer service content. By relying on ChatGPT's multi-round dialogue and key accounts exploration capabilities, relying on user portraits, and combining professional marketing knowledge, the marketing language can be accurately output to achieve personalized marketing[4]. Furthermore, marketing data are collected and integrated, and intelligent algorithms are combined to generate marketing plans for financial institutions. It can provide reference value for market segmentation and target customer selection, providing new ideas for strategic formulation of financial institutions, and promoting the construction of innovative marketing models.

C. Credit risk control and compliance control

In terms of risk control, ChatGPT is used to monitor market changes in real time. Through integrated analysis of built-in industry data and historical events, risk control strategies are formulated from the overall perspective to strengthen effective risk assessment and avoidance of financial products, timely adjustment of non-performing financial products. At the same time, a risk early warning mechanism is built for financial institutions to monitor financial products in real time for better risk control[5]. For investors, ChatGPT can also combine various indicators to judge risk factors, compile risk analysis reports, and provide reference for investors to make investment decisions, thus reducing their potential profit losses.

Commercial banks can link to ChatGPT to further improve risk management. When utilizing ChatGPT's data analysis and processing capabilities, it facilitates analyze various unstructured data and generate risk analysis reports based on risk factors. Thereby effectively improving the efficiency and accuracy of risk management and providing reference advice for banks to avoid risks. Apart from that, healthy operation is crucial for insurance companies. On the basis of comprehensive analysis and assessment of the risks of the business involved, insurance companies recommend more secure insurance products and services for customers, and protects the interests of customers. They can also make use of the extensive industry and related product data built into ChatGPT to process and learn a lot of relevant professional knowledge, and promote the effective improvement of risk assessment capabilities through risk prediction, document processing and other technologies[6].

D. Intelligent investment advisor

In analytical scenarios such as intelligent risk control, intelligent investment research, and intelligent advisory, ChatGPT uses its natural language processing capabilities to conduct a comprehensive and accurate analysis of a large amount of relevant information, thus laying a solid foundation for subsequent financial decisions. Customers can use pre-trained ChatGPT to provide customized private-investment advice, and several financial institutions at home and abroad have used ChatGPT to provide customers with accurate personalized consultation and services through text or voice dialogue [7]. ChatGPT combines its own advantages and completes the full analysis and prediction of the company's financial and industry data from the overall perspectives, which helps investors to better understand the market situation, make scientific investment decisions, and effectively reduce investors' investment risks.

At the same time, combined with the early integration of marketing data and risk control, combined with user behavior and feedback, real-time adjustment and optimization of the generated content, targeted recommendation of investment projects and more efficient matching of investors' desired investment projects are made. Thus, it can accelerate the optimization of operational capabilities and improve customer satisfaction to a large extent [8]. In addition, institutions can collect relevant data and use powerful data processing capabilities to provide investors with simple and feasible quantitative investment strategies such as mean regression and variance tests. Combined with ChatGPT's data analysis and prediction functions, it can compile project feasibility and return on investment reports to provide investors with more refined and visual suggestion analysis for investment decisions. ChatGPT continuously improves the output quality and strengthens the accuracy and stability of investment strategy through continuous learning and parameter adjustment of built-in large-scale language model and iterative optimization. After the model is confirmed, the model can also conduct further quantitative analysis and processing of investor information, use code writing to better execute automatic trading strategies, and reduce transaction costs as well as investment thresholds for investors with different professional levels[9].

E. Financial analysis and budgeting

The application of ChatGPT in the financial department can enable preliminary learning of financial data, external market information, accounting knowledge, national laws, regulations and policies of financial institutions. On the basis of ChatGPT, the study of historical financial data of enterprises can timely discover the rules and trends which extracts the useful key indicators. In this process, it combines the data sorting and analysis function of ChatGPT. This technology helps construct financial analysis and prediction model, comprehensively analyze the debt repayment, profit, operation, and development ability of financial institutions, and prepare financial analysis reports and related internal statements. At the same time, based on comprehensive analysis of historical data, scientific prediction is made, budget plans are developed, budget deficiencies are found in time, and budget preparation is constantly improved. In the whole process, manual feedback reinforcement learning is constantly carried out to optimize the model and comprehensively empower the transformation and upgrading of traditional financial departments[10].

III. LIMITATIONS OF "CHATGPT+ FINANCE" APPLICATIONS

A. Cost problems

According to Guosheng Securities research in 2023 shows that on the basis of current most cost-effective Nvidia A100 server as computing power, 25 million daily search volume, ChatGPT initial computing power investment of about $800 million, a single training investment of $1.4 million. As a large language model, the training process of GhatGPT is to first absorb massive data in the database. Each update and placement of the data costs a lot, and the quality of the data is often uneven, which requires financial institutions to spend manpower costs to screen. Also, regular supplementary training of the data model and software update and maintenance process are required. This will also involve a lot of manpower and material resources, and the high cost is one of the important factors hindering the implementation of the ChatGPT application [11].

B. Credibility and specialization issues

Customers in the financial industry demand high precision, and ChatGPT, as a universal application tool, is generally not able to meet highly specialized financial needs. GhatGPT is a large language model based on training and data placement. To ensure the accuracy of corresponding decisions, high requirements are placed on data quality and data update speed[12]. With the changing of the financial environment, it is likely to cause the customer's investment information bias, leading to their decision-making errors, affecting the reputation of financial institutions. Thus, it is worth noting that each update also has to spend a lot of costs. At the same time, due to the problem of the artificial intelligence black box and the dilemma of the information cocoon, it is inevitable for customers to question the credibility of information data provided by ChatGPT and whether it has the professional skills to make corresponding investment decisions[13].

C. Safety and standardization issues

In the use of ChatGPT, personal privacy information leakage big data killing, and other problems need to be solved. It involves the internal data of relevant financial institutions and the privacy information of customers. Firstly, in actual operation, it is very likely to flow into the ChatGPT platform due to non-standard operations, resulting in data leakage. For example, Copilot, a programming assistant developed by Microsoft and OpenAI, has been accused of copying open sources code on Github. Second, data leakage is involved in the operation process, and the use of prompt language injection means to reverse deduce customer information. At the same time, in practical application scenarios, the content generated by ChatGPT is likely to lack thinking logic and be not original, which will lead to the risk of plagiarism to a large extent[5]. How to identify the liability of using ChatGPT to harm customer information security and how to solve relevant legal problems are the gaps in China's legal system, which needs to be improved urgently. Building a sound legal system is also an important measure to strengthen its security and standardization.

D. Application landing and technical support

There are still many problems in the application implementation and technical support of ChatGPT in financial institutions. Firstly, the limitations of the technology itself. Due to technical limitations, ChatGPT needs to be improved in terms of timeliness and accuracy. And the limited built-in information will cause some deviations in ChatGPT and produce meaningless responses. Secondly, answers from ChatGPT tend to be middle-of-the-road, and its logical and critical thinking needs to be improved. At the same time, the preference setting of the data model will also trap users in unreal and impersonal information. Apart from that, China currently has no mature commercial ChatGPT products with independent intellectual property rights. On the one hand, China must strengthen chip research and development to meet the needs of product training; On the other hand, Baidu Wenxin Yi, iFlytek AI (artificial intelligence) learning machine, Jingdong ChatJD and Tencent mixed-Yuan Assistant are all in the process of researches and development, so the application of ChatGPT is still in the development stage [14].

IV. FUTURE EXPECTATIONS

ChatGPT provides decision-making advices to financial institutions to improve their work efficiency, effectively improve the intelligent interaction effect of traditional industries, and has broad application prospects in the financial industry. Using the effective combination with ChatGPT to achieve the purpose of reducing cost and increasing efficiency, improving quality, and increasing efficiency in the financial industry. At present, the

research on the application of ChatGPT in the financial industry is still in the theoretical stage, and there is still a long way to go in the future. Therefore, based on the future application research of ChatGPT in the financial industry, this paper puts forward three dimensions of empowerment suggestions and expectations.

A. Government empowerment: improve laws and regulations and implement comprehensive information protection

In April 2023, the Chinses state issued the policy document "Measures for the Management of Generative Artificial Intelligence Services (Draft for Comment)" for the generative artificial intelligence industry, which laid the foundation for the standardized application and healthy development of generative artificial intelligence represented by ChatGPT[15]. Compared with Europe and the United States and other countries, China's artificial intelligence legislation is relatively backward[5]. The government should face up to the double-sided nature of ChatGPT AI, improve relevant laws and regulations, establish a user authorization mechanism, and effectively enable the comprehensive and healthy development of ChatGPT from the legislative level.

B. Self-empowerment for institutions: focus on talent training and promote human-machine coordinated development

A new round of technological revolution represented by ChatGPT is coming one after another, which will certainly have a subversive impact on traditional industries. Therefore, the financial industry itself should strengthen its awareness and continuously promote the implementation of the goal of digital intelligent transformation and upgrading. On the one hand, we should strengthen the training of composite talents and establish a multi-dimensional training system to better adapt to the technological change in the new era. On the other hand, efforts should be made to introduce high-end management talents and technical talents in the fields of algorithm and data science, build professional technical departments of the organization, lay out the construction of a talent system, and constantly stimulate the potential of human-machine coupling.

C. Technical empowerment: continuous improvement of algorithms and innovative scene fusion methods

At present, although ChatGPT has developed rapidly in the context of digital intellectualization, it still has many limitations, which need to be overcome by continuous innovation of modern information technology and intelligent algorithms as well as continuous optimization of algorithm technology. At present, the latest ChatGPT uses the multi-modal large language model GPT-4, and its functions are limited to text and image transmission. In the future, through the deep integration with various apps and NLP, knowledge graph, computer vision, intelligent voice, and other technologies, the application scope and field will be further expanded, and the implementation of scene and application will be effectively promoted. At the same time, institutions can innovate the scene integration method combined with the financial industry, and actively promote the landing of technology.

V. CONCLUSION

In conclusion, this study believes that ChatGPT has certain significance and contribution to the innovation of service and operation mode in the future financial field, as well as the construction of strengthening the level of competitiveness. This paper provides a new idea for the application of ChatGPT in China's financial industry, thus helps promote the development and progress of this field. However, there are still some limitations in using this AI technology, such as cost problems and information security problems in practice. It is believed that through continuous researches in the future, the landing problem of ChatGPT based on the financial industry could be solved to a large extent.

Finally, it is hoped that this research can provide useful references and inspirations for the research in related fields. And at the same time, in the process of exploration, it will continue to promote the in-depth integration of ChatGPT artificial intelligence technology in financial institutions. In that way, it will help accelerate their digital intelligent transformation and upgrades in order to help improve the quality and efficiency of financial services. Therefore, it can contribute to the construction of a healthy, orderly, efficient and intelligent national financial development system.

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