



# The Impact and Challenge of ChatGPT on Library Work

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**Abstract.** Released in late 2022, the ChatGPT system has quickly become the focus of attention in the library industry. Trained on advanced model development, ChatGPT is capable of accurately understanding human language and generating natural and fluent text conversations, with significant advantages that could disrupt the library industry in the future. This paper analyses the technical features of ChatGPT, exploring its implications and challenges for the work of libraries and how to address these challenges. The research aims to improve the understanding and use of ChatGPT in libraries and to promote innovation and development in library work.

**Keywords:** ChatGPT · Library · Artificial Intelligence · Information Resources

## 1 Introduction

Launched in late 2022, ChatGPT has become the fastest growing AI system in history in terms of registered users [1]. ChatGPT is trained on advanced model development and has a wealth of knowledge to understand the context of conversations and generate text, as well as writing code, text creation and multilingual translation. Because of its significant advantages, ChatGPT has quickly become the focus of global attention, driving a new wave of artificial intelligence development. Microsoft integrated ChatGPT into all of its products in February 2023, including the Bing search engine, Edge browser and the Office suite of products [2]; during the same period, Google released its chatbot system “Bard”. Domestic internet companies are also actively laying out artificial intelligence systems. Baidu launched the first domestic product to benchmark GhatGpt, “Wenxin Yiyin”; Tencent announced a patent for human-computer dialogue [3]. Various industries around the world are researching and analysing how to introduce AI technology.

ChatGPT has also brought a huge impact on the library industry. In the face of the rapid development of AI technology, how to introduce AI technology to promote the development and innovation of libraries is a question we need to think deeply about. This paper analyses the possibilities of ChatGPT’s application in the library sector based on its technical features, and discusses the impact and challenges it brings to libraries and what to do about them.

## 2 ChatGPT Overview, Key Features and Limitations

### 2.1 Overview

ChatGPT is an artificial intelligence chat system released by OpenAI, with core technology originating from the GPT family of natural language processing models, GPT (Generative Pre-trained Transformer) is a generative pre-trained language model. From the first generation of GPT-1, which appeared in June 2018, to GPT-2, GPT-3, and now GPT-3.5 and GPT-4, rapid iterations have been made in just five years, with the number of model participants exploding with each generation and the amount of data for pre-training growing exponentially [3]. ChatGPT is developed based on the GPT-3.5 model architecture, and with the new addition of RLHF (Reinforcement Learning from Human Feedback). The model is pre-trained using a large corpus and then fine-tuned for specific tasks, allowing it to be better adapted to various application scenarios [4]. The newly released GPT-4 model has larger parameters, uses more high-quality data resources for training, focuses on strengthening the ability to compose and process long texts, adds understanding of images, enables complex inference, and has a significantly better grasp of semantic logic than the older version [5].

### 2.2 Key Features and Limitations of ChatGPT

Unlike traditional search engines that search for questions and give multiple search results for users to filter, ChatGPT has stronger language understanding and text generation capabilities and can be used in a variety of work scenarios, even for complex text analysis and logical reasoning tasks.

ChatGPT's key features include: (1) the ability to accurately understand context and generate natural and fluent text conversations. ChatGPT uses a deep learning based neural network model, and the model training data is also rich, making ChatGPT capable of handling complex conversations and reasoning, accurately capturing the intent of the conversation to provide more accurate and effective answers, and learning human language habits to generate natural and fluent text conversations. (2) Highly scalable. ChatGPT models can be continuously optimised and tuned through corpus training to provide better performance and a wider range of applications, and can be integrated with a variety of systems through plug-ins, interfaces, etc. to meet the needs of different industries. (3) ChatGPT has the courage to question and admit mistakes, adjust and optimise answers.

Although ChatGPT already has advantages that other AI systems do not have, it still has some limitations. (1) Credibility and accuracy issues. Although ChatGPT has been trained using a large scale corpus, the accuracy of the generated conversations is very dependent on the quality of the corpus and there is insufficient knowledge coverage of certain specialised areas to handle complex and specialised language, sometimes giving answers with large deviations or errors. Due to the high training costs, ChatGPT is unable to cover new information resources, and currently ChatGPT uses data from 2021 and cannot respond correctly to new events that occur after 2022 [5]. (2) Inability to identify special messages. While ChatGPT currently understands text and images better, it is still unable to handle audio, video and industry-specific special numbers, symbols and

grammar rules. (3) Privacy and security issues. In the process of communication and interaction, ChatGPT may collect and store users' personal information, and the risk of information leakage is also an issue that we need to pay attention to.

### **3 The Influence of ChatGPT on Library**

With the development of informatization, digitization and intelligence in libraries, new technologies represented by artificial intelligence, big data and cloud computing have changed the operation and service mode of the traditional library industry. The application of new technologies has reduced the cost of library inputs, improved the quality and efficiency of work, and given staff more time and energy to devote to more pressing tasks, thus shifting the library from its initial loan and return-based services to deeper and more innovative services. In the future, as artificial intelligence systems such as ChatGPT become more popular, a range of library tasks will also incorporate more ChatGPT technology, which will have a greater impact on the work of libraries.

Firstly, the introduction of ChatGPT technology will improve the quality and efficiency of library services. The essence of library services is to provide a variety of knowledge services to patrons. In the early days, counselling services were generally provided by sending emails, online consultations, or by setting up disciplinary service groups to answer questions. With the rapid development of artificial intelligence technology, some libraries have developed intelligent question and answer systems to solve the problem of inefficient and slow response to manual services. These intelligent question and answer systems are mainly based on a keyword recognition model, extracting keywords and then searching in an existing knowledge base, matching the search results and then feeding the answers back to the user [6]. This model has a low match rate and requires the user to build their own knowledge base, and incomplete coverage of the knowledge base can result in the system failing to respond. Early intelligent question and answer systems were only suitable for answering common questions and could not be personalised. The introduction of ChatGPT technology allows for the development of a flexible and efficient intelligent consultation system. The system can answer questions anytime, anywhere, reducing user waiting times, and can understand the user's intentions precisely, thus providing an efficient consultation service.

Secondly, ChatGPT technology can broaden the channels of information resources. Libraries are academic resource centres and information resource building is the core work of libraries. With ChatGPT technology, libraries can work with publishers to build a multi-channel intelligent book collection platform, optimise and adjust the purchasing process. Readers can purchase books from various channels on the online platform, and the system can automatically classify and store the purchased books, compressing the purchasing process, improving the efficiency and accuracy of purchasing, and widening the purchase channels of paper resources. In addition, in the construction of digital resources, libraries can only purchase resource databases of some disciplines due to insufficient funds. In order to solve the problems of insufficient information resources and information silos in individual libraries, they carry out the common construction and sharing of information resources, inter-library loan and other services by joining library unions and other means. However, these methods are more complicated, less

personalized and cannot guarantee efficiency [7]. ChatGPT's vast library of resources can broaden the use of digital resources, and can also be optimised using techniques such as fine-tuning to make it more adaptable to the library's mission, uncovering valuable digital resources and building a digital resource sharing platform with wider coverage and richer information resources.

Thirdly, it assists in the operational management and scientific decision-making of the library. Scientific management decisions require analysis of library-related data. Through the collection, collation and analysis of data, the hidden relationships between data can be refined to form valuable analysis results to assist curators in their management decisions. As the volume of data grows rapidly, the complexity of data types is increasing, and the difficulty of analysis is increasing, traditional data analysis methods can no longer meet the needs, and new technologies need to be introduced to optimise and improve analysis methods and fully explore the correlations between data to make research results more accurate [8]. The introduction of ChatGPT technology leverages its ability to understand natural language, text generation, powerful arithmetic and coding capabilities for fast and effective data analysis. Staff simply collect the relevant data, input requirements and criteria, and ChatGPT generates high-quality analysis results. For example, analyse user behaviour, and understand users' needs and preferences by analysing data such as readers' borrowing history, access records and action trajectories to customise personalised services for readers. Analyse the collection resources, by analysing data such as the utilisation rate of book resources, access rate of digital resources, scientific research results, etc., to predict the future trend of readers' demand and adjust the purchasing strategy in time. It can also evaluate the effectiveness of services, and understand user satisfaction and needs by analysing data such as feedback and interactive evaluation of reader questionnaires to assess the effectiveness of library services, so as to continuously improve service quality.

Fourthly, supporting information literacy education. Information literacy is the ability to use information effectively to solve practical problems. Libraries have carried out various forms of training on information literacy education. However, due to a lack of teachers, the development of information literacy education faces a lack of innovation in curriculum design and a lack of demand from students. The use of ChatGPT to assist with information literacy education will greatly improve these problems, as ChatGPT technology can provide self-directed learning, real-time feedback and personalised assistance, and ChatGPT can assist teachers in preparing lessons, designing syllabuses and lesson plans, and enriching teaching content.

Fifthly, assisting libraries in their reading promotion activities. In the context of deeply promoting reading for all and building bookish campuses, university libraries are duty-bound to become the sowers of reading for all and the practitioners of reading promotion [8]. Libraries will attract students' participation and cultivate their reading habits by holding regular reading promotion activities and recommending classic books on a regular basis. However, due to the lack of professional reading promoters, reading promotion has less impact and students are less motivated to participate in the activities and do not achieve the expected results. ChatGPT can be used to collect readers' interactive information, analyze their interest preferences, and design creative and high-quality

activity programs to attract more readers to participate and improve the influence of reading promotion.

#### **4 The Challenges and Countermeasures of ChatGPT to Libraries**

In the future, as AI technology becomes more and more popular, ChatGPT and other AI systems will be increasingly used in various library work scenarios, and the work mode of libraries will change from the traditional manual-based work mode to a human-machine cooperation work mode, which will also bring huge challenges to libraries. The following measures can be taken to address these challenges: how to use the strengths of each to work together to complete more complex tasks, how to manage and optimise systems to overcome the limitations of AI technology, and how to better protect the privacy of users.

(1) Expanding the knowledge structure of librarians. With the popularisation of artificial intelligence technologies such as ChatGPT in libraries, librarians need to have knowledge capabilities in a variety of disciplines, both in terms of expertise in relevant fields and understanding of artificial intelligence technologies, data analysis and other aspects of technology to ensure efficient operation of the human-machine cooperation model. As technology continues to change, librarians are also required to keep abreast of new technological developments to ensure the long-term stability of the application system. During the application process, there is also a need to overcome some technical complexities and improve issues such as user experience and usage effectiveness.

(2) Improving the accuracy of ChatGPT output, which is based on a large corpus of training and is very dependent on the quality of the corpus, otherwise biases and errors may occur. Moreover, the different language expressions and habits in different cultures can also affect ChatGPT's output by misinterpreting the context. The following measures can be taken. One, librarians need to conduct in-depth research and understanding of language expressions in different cultural contexts in order to better train and optimise their models and improve their ability to understand contexts in different cultural contexts. Secondly, the quality of the input data should be improved. Data can be pre-processed through technical means such as data cleaning and data mining to improve the accuracy, integrity and reliability of the input data. Third, establish technical service standards. The scope, purpose, process and results of the application of ChatGPT technology are clearly defined, and the establishment of service standards can standardise the process of technology application. Fourth, regular evaluation and review. Libraries can assess and review the effectiveness of the application through user satisfaction surveys and technical evaluations to identify and solve problems in a timely manner. Fifth, establish a system of accountability. A responsibility system for the application of ChatGPT technology can be established, such as an approval system and a recourse system, to clarify the responsibilities and obligations of technology application and to guarantee the standardisation and controllability of technology application.

(3) Strengthening privacy protection. ChatGPT needs to handle a large amount of user data, and privacy protection has become a matter of great concern. Libraries need to ensure the privacy and security of user data to avoid leakage and misuse. The following measures can be taken to strengthen privacy protection: formulate a privacy policy,

stipulate the principles of collection, use and protection of user data, specify privacy risks and preventive measures, and strengthen user privacy protection; strengthen data security protection, adopt measures such as data encryption and backup to ensure the security of user data, as well as strengthen monitoring and response to incidents such as data leakage and misuse; limit The scope of ChatGPT technology application is limited to reduce the risk of privacy leakage.

## 5 Conclusion

The advent of ChatGPT is a milestone in the development of artificial intelligence technology and has had a huge impact on a resource-centric and service-oriented industry like libraries. In the future, AI will replace some repetitive tasks, but not innovative ones, and librarians will still play a leading role in the future of work. Faced with the impact and challenges brought by artificial intelligence technology, librarians need to change their traditional way of thinking, improve their creative awareness and innovation ability, pay attention to the development of artificial intelligence technology, apply more of the new technology to their work, continuously improve the quality and efficiency of their work, and better help the development of libraries.

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