

SWOT Analysis of Library Industry Development under the Background of Intelligent Dialogue Tool Application

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Abstract: The popularization and application of ChatGPT intelligent dialogue tools provide more possibilities and options for library knowledge service intelligence. With the help of GPT technology, libraries can embed digital avatars in the library service system, utilize intelligent tools to generate cross-modal functions between text, images, and videos, establish associations and clustering between collection data, and upgrade knowledge services. SWOT analysis is a common business strategy tool that helps organizations understand their strengths, weaknesses, opportunities and threats. This paper adopts SWOT analysis to analyze in detail the four aspects of the library in the context of the application of ChatGPT-like intelligent conversation tools, and puts forward the corresponding development proposals. ChatGPT can bring many advantages in library applications, including improving service efficiency, increasing librarians' productivity, and providing personalized services. With the continuous development and application of technology, the application of ChatGPT in the library field will also be expanded and deepened. However, it should also be seen that due to the limitations of ChatGPT's own technology and the defects of the database used for training, the application of intelligent dialog software will inevitably have certain difficulties and information security problems. Libraries need to provide high-quality text, big data and corpus for AI applications on a safe and controllable basis. With the help of intelligent dialog software, the transition to intelligent libraries can be accelerated.

Keywords: Intelligent Dialogue Tool; ChatGPT; the Library; SWOT Analysis

1. Introduction

The development of artificial intelligence has made intelligent conversation technology develop by leaps and bounds. ChatGPT is the representative of intelligent conversation technology. It is a large-scale pre-trained language model based on deep learning. Through the use of powerful transformer model algorithms and use of massive data sets, it has developed the ability to handle multiple natural language tasks. It can not only generate, understand, and recognize natural language, but also carry out interactive dialogue, generating high-quality text intelligent dialogue tools with high fluency and grammatical correctness. Pre-training enables ChatGPT to have a deeper understanding of language generality and grammatical structure, and a series of neural network technologies such as multi-head attention mechanism enable ChatGPT to have strong expressive power and efficient computing power. Therefore, it can flexibly generate the text content according to the task requirements, and quickly process a variety of natural language corpus including English, Chinese, Spanish, French, etc., to complete the generation and understanding of multi-language text tasks. It supports multi-modal input in various formats including images, videos, text and language, and has excellent ability to process multivariate data. With powerful model parameters and technical support, it can automatically generate high-quality natural language text such as news reports, comments and stories in a variety of forms and styles.

Its good context-aware function makes it excellent in tasks such as conversation generation and question and answer system. You can better understand the meaning behind

natural language, understand and process contextual information, and understand the linguistic meaning and context of conversations based on the content of previous interactions. Under the same model structure, ChatGPT can handle multiple tasks at the same time, improve model learning efficiency and share underlying parameters. Due to its powerful adaptive learning ability, it can automatically adjust the parameters and learning strategies of the model according to the specific needs of users, in order to provide better performance and more accurate output results, and therefore in the process of application, the performance can be continuously improved. Continuous development and innovation, so that it has good scalability. As more variants and improved techniques continue to emerge, it is possible to fine-tune pre-trained models based on large-scale data to suit specific tasks and scenarios. At present, some domestic scholars have begun to study the impact of the application of intelligent dialogue software represented by ChatGPT on the library industry. For example, Zhao Ruixue et al. analyzed the development history, technical characteristics, typical application scenarios, integrated application path, limitations and security risks of ChatGPT. This paper summarizes the impact of ChatGPT on libraries [1]. Zhang Hui et al. elaborated the innovative experience that GPT technology-driven innovation may bring to users [2]. Chu Jiewang et al. discussed the impact of AIGC on library services and its application prospects from the evolution of the underlying technology [3]. Li Shuning et al. tested and investigated ChatGPT from a business perspective, and demonstrated the opportunities and challenges brought by it. At the same time, it was pointed out that the time limitation of training data and default data of ChatGPT is before September 2021, and it is restricted by copyright and permissions in various commercial databases, making the data deviation problem unavoidable [4]. Zhao Yang et al. analyzed the framework, path and challenges of intelligent library transformation driven by AIGC, and put forward suggestions on the transformation and upgrading of intelligent library in the digital intelligent environment [5]. Guo Yajun et al. summarized the "4T characteristics" (Translation,

Transformation, Transmission, Treatment) of ChatGPT enabling library industry [6]. CAI Zifan et al. analyzed the application of ChatGPT in document procurement, resource organization and other scenarios [7].

SWOT analysis is a technique used to assess the internal and external environment, which stands for S-strength, W-weakness, O-opportunity, and T-threat. After enumerating internal advantages, disadvantages and external opportunities and threats, various factors are analyzed with the thought of systematic analysis, and then corresponding conclusions are drawn and clearer development strategies are formulated. By using SWOT analysis, this paper analyzes the advantages, disadvantages, opportunities and challenges of libraries, which is helpful to provide development suggestions for the transformation of libraries into smart libraries in the future.

2. S-strength of Knowledge Service in Traditional Libraries

2.1 With a Large Number of High-quality, Credible Scientific and Technological Literature

Libraries spend a huge amount of money every year on books, database rights, Copyrights, etc. These high-quality information resources are different from the readily available corpus and data sets on the Internet. The more high-quality cutting-edge information related to scientific and technological progress, the more difficult it is to obtain through free channels. This is also the advantage of the library as a base of information resources [8].

2.2 Humanized Service

Although intelligent software can process information efficiently, they are different from the human brain, which is difficult to understand the needs of users from the mental, emotional and psychological aspects and actively find ways and channels to meet them. According to the understanding of users' needs in social life, librarians design humanized and personalized accurate information push or book recommendation service projects on the basis of analyzing users' needs to meet different needs of users [9].

3. W-weakness of Knowledge Service in

Traditional Libraries

3.1 The Efficiency Is Relatively Low, High Cost

In AI2.0 environment, ChatGPT-like tools are beyond human reach in information search, text mining, analysis and text generation. Ai can work continuously and efficiently, enabling one-stop access to knowledge covering the vast majority of subject areas. ChatGPT can query directly in natural language and quickly get near-standard query results. Through pre-training, GPT intelligent software can also associate user data training knowledge through deep learning, and combine historical borrowing data to make accurate intelligent recommendation in line with readers' interests ^[10]. Manual completion of such work will take a long time, cost is high, and it is difficult to serve users on a large scale. Artificial Intelligent content generation (AIGC) introduces many technologies and algorithms. After pre-training with natural language training model, it can realize multi-language and multi-task simultaneous processing ^[11].

For example, ask ChatGPT the same question in Chinese and English, and ChatGPT gives an answer with amazing speed. Q: What are the TCM rehabilitation measures for stroke?

A: Stroke, or stroke, is a common disease. Chinese medicine offers several treatments for stroke rehabilitation. Here are some methods of traditional Chinese medicine:

1. Acupuncture therapy: Acupuncture involves inserting thin needles at specific points on the body. It is believed to stimulate the flow of qi and blood, promote the body's natural healing ability, and improve motor function after a stroke.

2. Chinese Herbal Medicine treatment: Chinese medicine practitioners may prescribe specific herbal formulations, customized according to the patient's situation. These herbs are believed to restore balance and improve blood circulation, thus aiding stroke recovery.

3. Massage massage: Massage is a kind of Chinese therapeutic massage that involves regulating the energy channels and acupuncture points in the body through various techniques such as rubbing, kneading and patting. Designed to promote circulation, relieve muscle stiffness, and enhance motor function.

4. Qigong and Tai Chi: These are gentle exercise systems that combine movement, breathing techniques, and meditation. Qigong and tai chi are believed to enhance energy flow and improve balance, coordination and overall health in stroke patients.

5. Diet Therapy: Traditional Chinese medicine emphasizes the importance of a balanced diet. Specific foods and herbal preparations may be recommended to support recovery, improve digestive function, and enhance the body's qi and blood.

It is important to note that while these measures are part of traditional Chinese medicine, stroke rehabilitation should be done in a holistic manner and in consultation with a medical professional who is both skilled in Western medicine and knowledgeable in Chinese medicine. They can provide personalized guidance based on an individual's condition and needs.

ChatGPT gives English answers in just five seconds and Chinese answers in 10-15 seconds. However, the breadth of librarians' personal knowledge is difficult to compete with intelligent search tools, and it often takes longer to obtain similar results by manual query. The above examples show the powerful language conversion and information search capabilities of AI tools. The traditional library knowledge service is restricted by the service skills, time, energy, knowledge and other factors, which is obviously insufficient compared with artificial intelligence ^[12].

3.2 Some Traditional Library Staff Will Be Replaced by Intelligent Dialogue Tools

The application of intelligent dialogue tools will drive the library business process to adjust with the change of resource organization, and reset the business positions. Ordinary work such as reference consultation, retrieval, checking and citing will be replaced by intelligent tools, and more jobs that need to provide intelligent knowledge services with intelligent tools will be set up.

4. O-opportunity Brought by the Application of Intelligent Dialogue Tools to the Library Industry

The integration of artificial intelligence technology into the knowledge services of libraries not only adds new service dimensions and methods, but also accelerates the deep

integration of science and technology and library services, and accelerates the transformation to smart libraries.

4.1 Intelligent Search Dialogue Tools to Improve the Accuracy, Convenience and Effectiveness of Search

The application of intelligent dialogue tools provides a rare opportunity for libraries to enhance knowledge services. ChatGPT transforms the "extraction and discrimination" mode of the original retrieval system into the "intelligent judgment directly generates results" mode, organizes the literature content knowledge, and directly provides the problem solution required by users, providing users with reference and making application more convenient. With the blessing of intelligent dialogue software tools, libraries can realize the deep integration of information resources such as digital libraries, electronic journals and online databases by upgrading various library retrieval systems, and improve the accuracy and effectiveness of resource retrieval.

4.2 To Meet the Rigid Needs of Readers Intelligent Consultation

Intelligent consultation is an important service content of intelligent library, which uses intelligent dialogue tools to automatically answer questions raised by users. As intelligent dialogue tools support multi-modal input such as images, videos, text and language, it will better meet the various complex consultation needs of readers and improve the experience satisfaction of consulting services.

4.3 The User Search Method Is More Friendly, Saving Library Training Costs

The application of ChatGPT changes the user information retrieval mode^[13]. Its powerful search engine function makes it easy for users to use natural language to achieve search, which makes search more convenient, reduces the user's use threshold, and changes the user's query mode to take the search engine as the starting point for information query and realize the search goal with the help of the search engine.

4.4 More Diversified Service Methods

With the blessing of intelligent software, it speeds up the transformation of library service

from single to diverse, from intelligent to intelligent. As the main body of knowledge service, the future library will provide more accurate and personalized knowledge service with the user as the center^[14]. Using the advantages of ChatGPT technology to provide users with tailored recommendation services, by quickly analyzing users' reading habits and preferences based on their historical borrowing and browsing information, to recommend books and other reference materials that match their reading level, interests and reading history. It can even provide text-based replies for users with hearing or visual impairments, constantly innovate service models, more diversified service methods, more precise and personalized service content, and thus improve user experience.

4.5 Service Research

ChatGPT technology's text production function, data analysis function, language conversion function, automatic generation of abstracts and other functions can assist researchers in academic research. Based on a given topic or keyword, rapid literature review can be generated by generating paper abstracts and listing relevant papers, which is conducive to researchers to quickly understand the development status of a certain research field. Its multilingual processing capabilities can also help researchers understand academic research published in different languages.

5. Threats and Challenges from Intelligent Dialogue Tools (T-threat)

5.1 The Application of Intelligent Dialogue Tools has Changed Users' Expectations of Library Knowledge Services

5.1.1 Improve the User's Requirements for Service Efficiency

The application of ChatGPT tools greatly improves the efficiency of knowledge service. In the process of traditional library services, users' tolerance for delayed gratification of manual services provided by libraries will continue to decrease under the background of the application of intelligent dialogue tools, and the demand for instant gratification will increase^[15]. Users' requirements on the time efficiency of library knowledge service will be greatly improved, but without changing the traditional library operation mode, it is

difficult to improve the efficiency, which will lead to users' dissatisfaction.

5.1.2 User Expectation Changes from Clue Search Results to Knowledge Search Results

In the application environment of Generative Artificial Intelligence (AI) and GPT (Generative Pre-trained Transformer) technology tools, Users' demand for library resource services will transition from document recording and document content to knowledge content reorganization, and users' demand for traditional information literacy will continue to weaken, while their requirements for information screening and judgment will continue to increase.

5.2 Technical Limitations and Security Risks of ChatGpt-like Tools

"Technology is a double-edged sword", the disruptive application of generative AI and GPT technology will mainly affect the field of human intelligence. When using ChatGpt-like intelligence tools, ethical issues such as bias in pre-trained model data, the right to know about the use of private data, intellectual property, transparency and accountability need to be considered. The credibility, copyright and information security problems of ChatGPT tools will also pose challenges to library management.

5.2.1 Credibility of Artificial Intelligence-generated Content

The output of ChatGPT depends on the data used to feed it into the pre-trained model, and the accuracy of the output information and the breadth of knowledge is limited by the pre-trained model. Biased and inaccurate information can easily appear as authoritative information in the search results it gives. Because the corpus and data set used for training intelligent dialogue tools are limited to publicly available resources on the Internet, the quality of their search results (especially the quality of academic literature) is relatively low. It is difficult to meet the high level needs of users. The opacity of ChatGPT's design and training makes it difficult for humans to identify and resolve potential problems. The training of the intelligent dialogue tool model requires a large amount of data, but the quality and diversity of the data may be biased, resulting in insufficient generalization ability of the model, and even produce wrong output. Chatgpt-like software generates replies based

on trained text content and data according to a certain logical algorithm^[16]. But the drawback is that the same question is asked in different ways, and the answers given are not the same, or even inconsistent. However, due to the strong logic of its output content, users often cannot verify it and it is difficult to judge the correct answer.

5.2.2 Privacy Data Security Issues

A considerable amount of the text generated by ChatGPT and the data in the text are obtained from the content entered by the user in the network through the web crawler^[17]. The issues involved in the use process, such as user privacy data security, trade secrets, intellectual property restrictions, information security processing, the establishment of supervision mechanism and emergency management, need to be standardized management.

5.2.3 Moral and Ethical Issues

The leap in performance of artificial intelligence has attracted much attention from scholars. While experts recognize the powerful features of ChatGPT, there is also a great deal of controversy in its application. Some studies have found that ChatGPT can help researchers do their research better and faster. ChatGPT's ability to summarize the main points of the paper and summarize the topic of the article makes it possible to generate a literature review of almost all scientific research fields in a short time, which helps researchers quickly understand the research status of the field and helps to write research reviews, while other experts have found through research that because of its undifferentiated processing of information when searching for information, The generated text contains false evidence or biased opinions, the information given is based on fake papers and the papers are not based on academic and academic research procedures, so it writes research reviews that are not scientific and credible, and can easily lead to high-tech plagiarism^[18]. Some researchers worry that the application of artificial intelligence will gradually make researchers lose their independence and creativity, and blindly trust the results generated by artificial intelligence tools.

6. Conclusion

Intelligent library will be a comprehensive perception library based on digitization,

networking and intelligence. The popularization and application of ChatGPT-like intelligent dialogue tools provide more possibilities and choices for intelligent library knowledge service. With the help of GPT technology, libraries can embed digital virtual people in the library service system, use intelligent tools to generate cross-modal functions between text, image and video, automatic generation of titles and abstracts and other functions to establish correlation and clustering between collection data, and upgrade knowledge services. The application of artificial intelligence has changed the information environment of the whole world, but at the same time, it should be noted that due to the technical limitations of ChatGPT itself and the defects of the database used for training, and the application and system optimization of ChatGPT require strong financial and technical support, the application of intelligent dialogue software will inevitably have certain problems and difficulties. In the field of scientific and academic research, the application of artificial intelligence must take into account the potential risks, and excessive reliance on ChatGPT in the field of scientific research can lead to serious consequences, such as plagiarism, research inertia and over-dependence. Since ChatGPT cannot distinguish between sensitive and private information, it is necessary to pay attention to information security issues. Libraries need to provide high-quality text, big data, and corpus for AI applications on a secure and controllable basis. Accelerate the transformation to a smart library with intelligent conversation software.

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