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The practical path of smart library construction in the era of science and technology

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Abstract: *The intelligent library is not only a place to store and transmit information, but also a comprehensive space for learning, research, communication and entertainment. It uses modern scientific and technological means to provide users with more convenient, personalized and interactive services, making the dissemination and acquisition of knowledge more efficient and accurate. Based on this, this paper studies the era of science and technology wisdom library construction practice path, analyzes the significance of science and technology era wisdom library construction, the practice of science and technology era wisdom library construction, and gives the era of wisdom library construction practice path, through the study of this paper, for the future development of the library to provide some useful enlightenment and reference.*

Keywords: *science and technology; intelligent library; practice path*

1. Introduction

With the rapid development of science and technology and the arrival of the digital age, the library, as an ancient palace of knowledge, is facing unprecedented challenges and opportunities. The traditional library model has been difficult to meet the knowledge needs of modern people, and the big data, artificial intelligence, virtual reality and other technologies brought by the era of science and technology provide powerful tools and possibilities for the reform of the library. How to combine these modern technologies with the core services of the library to build a real "intelligent library" is an important issue facing the library circle at present.

2. The significance of the construction of intelligent library in the era of science and technology

Today, with the rapid development of science and technology, smart library, as an important place for modern knowledge dissemination and cultural heritage protection, is becoming more and more prominent. Smart library is not only a storage place for books and materials, but also a center for knowledge exchange, innovation and learning. Its construction has a profound impact on the progress of society, culture, economy and even science and technology. First of all, the smart library strengthens the efficiency of information acquisition and dissemination. In the traditional library model, readers usually need to find the required information in many books, while the modern intelligent library uses the advanced search system and database to enable readers to quickly and accurately find the required information, which greatly improves the efficiency of knowledge acquisition. Secondly, the smart library provides the possibility of readers with remote access around the world through digital technology. Whether it is precious ancient books, manuscripts, or the latest research reports, they can be shared by more people through digital technology. This not only reduces geographical and time constraints, but also provides unparalleled research resources for researchers around the world. In addition, smart libraries also play an important role in cultural protection and inheritance. With the passage of time, many paper documents are gradually aging and damage due to the environment, use and other reasons. Digital technology provides a second life for these precious documents, so that they can be preserved for a long time and used for future generations. What is more worth mentioning is that the smart library can also promote interdisciplinary exchanges and cooperation. By establishing a complete database and communication platform, researchers can easily find other research fields related to their research field or can provide inspiration, so as to promote the cross-border integration and innovation of knowledge. Considering comprehensively, smart library not only provides people with a more efficient and convenient way to acquire knowledge, but also plays an irreplaceable role in cultural inheritance, interdisciplinary exchange, scientific research cooperation and other fields. In the

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era of science and technology, the significance of its construction is self-evident, and it has great value and contribution to promoting social progress, promoting knowledge sharing of globalization, and protecting cultural heritage.

3. The practice problem of intelligent library construction in the era of science and technology

3.1 Service experience is not up to standard

In smart libraries, what users expect is not only the convenience of obtaining information, but also the overall experience in the service process. First of all, although many libraries have invested heavily in digital resources, how to make users find the required resources more efficiently and intuitively is still a difficult problem, and many system interface design is not in line with human usage habits, resulting in users often feel confused in the operation process. Secondly, while pursuing technical services, many smart libraries ignore people's participation and perception, which leads to the lack of human touch and interactivity in the service process, which makes users feel isolated and helpless in the process of use. In addition, many smart libraries are too extreme in automation, ignoring some daily and small service needs, such as library guide, seat reservation, book recommendation and other functions are often not satisfactory. Finally, because the service experience is not up to standard, it may lead to the loss of library users, and affect the utilization rate and social influence of the library. In the long run, the social status and value of the library may be questioned.

3.2 Technology integration shall not be allowed

In the construction process of smart library, "technology integration" is a key problem that cannot be ignored. First, technology integration in the construction of smart library means the integration and collaboration of various technology components, platforms and applications. For example, library digitization, information retrieval, virtual reality technology, AI recommendation system, etc. If these technologies are not properly integrated, they may lead to conflicts between systems, blocking of data flow and repeated functions, which will further affect the operational efficiency and user experience of the library. Second, improper technology integration may also lead to a waste of capital and resources. Libraries may need to invest a amounts of money to purchase and maintain multiple systems that may overlap in functions, leading to redundancy in resources. In addition, whenever a system needs to be updated or maintained, it may affect the stable operation of the entire smart library, increasing the difficulty of management and maintenance. Third, for librarians and users, technology integration should not increase their learning costs. Librarians need to spend more time and energy to get familiar with and operate multiple systems, and users may be confused and dissatisfied because of the complexity and instability of the system.

3.3 Imperfect data protection

In the background of the increasing development of science and technology, the amount of data involved in smart library shows an explosive growth, including the electronic information of books, users' browsing, borrowing and even personal information records. However, "imperfect data protection" has become a big problem for smart libraries. First of all, due to the rapid speed of technology update iteration, many libraries often ignore the upgrade of the matching security protection mechanism, so that new technical loopholes cannot be found and repaired in time. Secondly, with the wide application of mobile Internet and Internet of Things technology, there are more and more data collection points in libraries, which also means that the attack surface is gradually expanding, and the traditional protection measures have been difficult to meet the practical needs. Finally, the lack of strict review of data protection clauses in many libraries during the procurement and use of third-party services or software may cause unnecessary risks of data during transmission, storage or processing. What is more serious is that the imperfect data protection may also affect the credibility and image of libraries. Once a data leakage event occurs, the operation of the library will not only be affected by the privacy and interests of users, but also face serious threats, which undoubtedly poses a challenge to the library's social responsibility.

3.4 Inefficient resource sharing

In the construction and operation of the smart library, the effective resource sharing is regarded as

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the key to improve the efficiency, expand the service scope and meet the diversified information needs. However, the problem of "inefficient resource sharing" gradually emerges, which is manifested in multiple levels and brings about a series of practical difficulties. First, from the technical perspective, there may be differences in the systems and standards used by different libraries, leading to the problems of mismatch and information loss in the exchange of resources. This not only hinders the mobility of the data, but also increases the difficulty and cost of technology docking. Secondly, from the perspective of management and policy, various libraries may have differences in their strategies and regulations on resource acquisition, authorization and use, leading to cumbersome and inefficient procedures of resource sharing. More importantly, as resource sharing involves complex legal issues such as copyright and intellectual property rights, resource sharing without full communication and coordination may touch the legal red line and bring unnecessary legal risks. Third, the inefficient resource sharing may also lead to limited user access, and affect the efficiency of user information acquisition. For example, some precious or popular resources may appear access bottlenecks, resulting in users waiting for a long time or cannot access. In the long term, this will damage the public image of the library and reduce user satisfaction and loyalty. To sum up, the efficiency of resource sharing is related to the core mission and value of smart library[1].

4. The practical path of smart library construction in the era of science and technology

4.1 Improve user interaction design

In the construction of smart library, it is particularly important to improve the user interaction design. Today's library users are no longer satisfied with the traditional information query function, and their pursuit of more intuitive, convenient and personalized service experience. In order to meet these expectations, libraries need to deeply study the behavior patterns, use habits and psychological needs of their target users, so as to provide users with more accurate services. Libraries should introduce the concept of user experience design, invite real users to participate in the process of service design, and collect users' feedback and suggestions through questionnaires, interviews, observations and other methods[2]. In the design process, focus on the user's situational experience to ensure that every interaction action complies with the user's intuition and expectations. For example, for the interface of the retrieval system, users' operation convenience and information acquisition efficiency can be enhanced through smooth animation, reasonable layout, eye-catching prompts and other elements. Smart libraries should also fully consider the characteristics of different user groups when implementing interaction design. For example, for older users, more concise interface and large size prompts can be designed; and for younger users, more personalized and social functions can be introduced, allowing users to obtain information and enjoy communication and sharing with others. In addition, continuous technological innovation is also the key. With the rise of new technologies such as virtual reality and augmented reality, libraries can try to provide users with a more immersive interactive experience. For example, with augmented reality, users can view book information on their shelves in real time on their phone or tablet[3].

4.2 Optimize the technology integration strategy

Facing the rapidly developing technological environment, libraries need to continuously review their technical framework to ensure that all kinds of technologies can coexist harmoniously and support each other. The core of the technology integration strategy is to perfect the latest technology with the daily operation of the library. This means that the library should not only introduce advanced technology, but also ensure that these technologies can actually help the library service. For example, in the book retrieval system, semantic analysis, natural language processing and other technologies can be considered, so that users can obtain more accurate results when retrieval. At the same time, big data and artificial intelligence can be used to conduct in-depth analysis of users' behaviors and provide them with more intimate and personalized recommendations[4]. To achieve an efficient integration of technologies, libraries need to establish a flexible technology architecture that ensures rapid access to new technologies and a smooth transition of old technologies. Such an architecture can not only support the current operation of the library, but also allow enough space to adapt to future technological changes. In addition, talent is also an indispensable element in the technology integration strategy. Libraries should strengthen the cooperation with universities and research institutions, cultivate and introduce more technical personnel with interdisciplinary background, and ensure that they can provide strong support in the process of technology introduction and implementation. Optimizing the

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technology integration strategy not only requires the library to have a forward-looking technical vision, but also needs to have sufficient implementation ability and talent support. Only in this way can the library always maintain its leading position in the wave of science and technology, and provide users with more abundant and efficient service experience[5].

4.3 Strengthen data encryption measures

As the central hub of knowledge and information, smart library security is the primary consideration for the large amount of data and information stored by it. Strengthening data encryption measures has clearly become the core of ensuring that this valuable data is protected from external threats. In today's increasingly digital world, data leakage or malicious tampering will cause serious damage to the reputation and service quality of libraries. The core of data encryption is the use of complex algorithms to convert raw data into information that is difficult to interpret for the outside world. This process requires strong and reliable encryption algorithms. When selecting encryption algorithms, libraries should give priority to the widely recognized encryption standards, such as AES (Advanced encryption standards) or RSA. These algorithms provide solid safeguards at the mathematical level, ensuring that data is fully protected when transmitted and stored. In addition to selecting the appropriate encryption algorithm, the library also needs to properly manage the encryption key. The management and storage of keys should be independent of encrypted data and should be updated regularly to reduce the risk of key disclosure. At the same time, the use of multiple encryption strategies, for example, secondary or even multiple encryption of sensitive data, can further enhance the security of data. But relying on technology alone is not enough, and human factors are often an important cause of data leakage. Therefore, libraries should regularly train staff on data security and encryption, so that they can clarify their responsibilities and roles in data protection. And through the implementation of a strict authority management system, to ensure that only authorized employees can have access to sensitive data. In addition, regular review and testing of the effectiveness of encryption measures are also indispensable. Libraries can consider introducing a third party organization to assess the strength of encryption, to ensure that their encryption measures are always at the forefront of the industry and are able to withstand the latest security threats. Strengthening data encryption measures is the key path for smart library to ensure data security. Only by using the comprehensive use of technical means, management strategies and human resources training, can the library truly provide users with a convenient and safe information service environment.

4.4 Promoting the resource allocation mechanism

In the overall development blueprint of smart library, the optimization and improvement of resource allocation mechanism has become a key issue. Smart library not only carries a large number of knowledge and information resources, but also needs to effectively allocate various resources, such as technology, human resources and financial resources, so as to ensure its continuous, stable and efficient service to the majority of readers. The core of resource allocation lies in how to ensure the maximum use of all kinds of resources, and how to realize the dual pursuit of the long-term development and the short-term goal of the library. By deepening the internal resource audit of the library, the current situation can clearly understand the use of resources, so as to carry out more accurate allocation and adjustment. For example, for the book procurement budget, according to the actual needs of various professional areas of the library, reasonable allocation of funds to ensure that the library books always keep pace with The Times. With the development of digitalization and Internet technology, electronic resources have gradually become an important part of the library. Therefore, when allocating resources, the smart library needs to increase the investment in electronic resources. At the same time, taking into account the technical and human support needed for the maintenance, update and management of electronic resources, the corresponding resource allocation is carried out. In order to further improve the resource allocation mechanism, the library also needs to establish a dynamic feedback and adjustment system. By collecting user feedback, analyzing resource use data and conducting regular resource assessments, libraries can timely detect and adjust deficiencies or surplus in resource allocation. For example, when the utilization of books or electronic resources in a field is low, the library can adjust the purchasing strategy appropriately, or improve the utilization of resources in the field through promotional activities. As the most valuable asset of a library, the allocation of human resources is just as important as the training. The library should reasonably allocate the staff according to the work content and needs of each department, and at the same time provide continuous training and training opportunities to ensure that the professional skills and service level of the staff match the development needs of the library. Promoting the resource allocation mechanism is an indispensable link

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in the construction of intelligent library. Only by ensuring that all kinds of resources are allocated reasonably and effectively allocated, can smart libraries truly meet the needs of users and continuously promote the improvement of their service quality and scale.

5. Conclusion

With the progress of society and the rapid evolution of science and technology, the library, as a beacon of knowledge, also needs to keep pace with The Times and move towards the development track of wisdom and science and technology. In the past, silent bookshelves and paper books, to today's electronic resources and virtual reality guides, the library is not only a temple of knowledge, but also an exhibition hall of technology and culture, tradition and innovation. The practical path of smart library construction is a process of exploration and practice, involving strategy adjustment, technology application, user experience optimization and other aspects. No matter how technology changes, the core value of smart library always lies in spreading knowledge and serving the public.

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