International Journal of New Developments in Engineering and Society
ISSN 2522-3488 Vol. 4, Issue 2: 91-96, DOI: 10.25236/IJNDES.040218

Architecture and Research of Smart Book Management System Based on Artificial Intelligence Technology

Xiaojing You

School of Economics and Management, Jiangsu Maritime Vocational College, Nanjing 210000, China

ABSTRACT. *With the continuous innovation and development of various new technologies, artificial intelligence technology has also been widely used in the field of smart books. The article proposes a design idea for a smart book management system based on artificial intelligence technology. It first analyzes the characteristics of various types of information in the book, analyzes the design requirements and system architecture of the smart book management system based on artificial intelligence technology, and truly realizes the automated office management of the book management system using artificial intelligence.*

KEYWORDS: *Artificial intelligence technology, Smart library, System architecture*

1. Features of various book information

1.1 Features of Internal Network Information

In the study of the library management system, the first thing to study is the network information inside the library. We know that because of the limitations of the internal network, the internal network only depends on the subject, network resources and the library. A network established in terms of the geographical location of Existing, and then through the internal network for all the books in the library classification time, book category, and book structure, etc. to carry out some related research and analysis investigation, thus establishing a complete set of library information management system [1].

1.2 Internet Information Features

For the entire Internet, the amount of information it contains is very diverse, and it will continue to expand over time, where the types of information are also diverse and constantly changing, of course, Its information structure is also particularly complex, but for the internal network, the information on the Internet is of great

ISSN 2522-3488 Vol. 4, Issue 2: 91-96, DOI: 10.25236/IJNDES.040218

significance for widening the internal network. However, [2] at present, because there is not a large amount of information on the Internet that can be managed in a unified manner, and the information is also widely distributed, there is no standard for management. Therefore, the huge information resources can often quickly analyze the relevant titles and book classifications. In the large system of the Internet, you can quickly and accurately find the valuable relevant information you want to search.

2. Design Requirements of Smart Book Management System Architecture

2.1 Managers' Needs

As library managers, the functional requirements for management information systems are mostly focused on processing information. In smart libraries, managers have at least the following requirements for information systems [3]:

(1) System management requirements: the administrator needs to maintain the library system, and participate in the development and improvement of the system when necessary, so it is necessary to establish a system management module so that the administrator can directly respond to the actual situation of the library development The information system itself is managed;

(2) Librarian and employee management needs: There are multiple functional departments in the library, and the management system should set up corresponding functional modules, so that managers can coordinate and coordinate employees, and at the same time provide a way for communication between various departments;

(3) Reader information management needs: Readers are the core of library services, collecting readers ’information and providing readers with efficient services based on the collected readers’ information is the focus of library managers ’work, so readers’ information management of information systems The module is its core module;

(4) Collection resource management module requirements: The library, as a document and data storage and management institution, manages physical and digital resources of the collection is one of its basic tasks. The collection resource management module with good performance is conducive to improving library information. Resource allocation efficiency, thereby improving the efficiency of managers.

2.2 Readers' Needs

Readers are the service objects of the library and the information service objects of the management information system. In the new period of explosive growth of information, the smart library is to help readers find the information they really need from the massive information and provide readers with personality and efficient

ISSN 2522-3488 Vol. 4, Issue 2: 91-96, DOI: 10.25236/IJNDES.040218

service. In the smart library system, readers have the following requirements [4]:

(1) Document search and borrowing needs: Whether in a traditional library or a smart library, readers 'basic needs for libraries are the borrowing and searching of documents. The smart library should be based on the combination of traditional library functions. Readers provide more intelligent document search and borrowing services;

(2) Personal information setting and viewing requirements: My libraries mostly use My library to allow readers to manage personal information, view historical borrowing and historical retrieval information, but lack the information setting part of newly introduced technologies such as mobile terminal, smart library When constructing a new management information system, the corresponding functions should be improved;

(3) Demand for independent learning: Nowadays, online learning functions such as mobile libraries and MOOCs have formed a scale in the library, and people's awareness of autonomous learning has also been greatly improved. The management system needs to manage and classify online learning content in order to give full play The value of content improves the enthusiasm and learning efficiency of people using the library for learning;

(4) Personalized recommendation needs: More targeted personalized services are the main direction of the library's future development, and personalization is the core part of readers' needs. The main purpose of introducing intelligent technology in libraries is to provide readers with more personalized services. With the improvement of people's information literacy, the requirements for personalized services are becoming higher and higher. The main form of library using technology to provide readers with context-sensitive services is personalized recommendation, so personalization is more important in readers' needs position[5];

(5) Information exchange and sharing needs: Only a small number of libraries in China have set up BBS or message boards for readers to communicate. In fact, creating a good information sharing atmosphere is conducive to increasing the enthusiasm of readers to use the library for reading and learning. Building an information sharing platform is conducive to creating a good atmosphere;

(6) Opinion collection and feedback needs: The library should firstly take the initiative to discover and excavate the readers' needs. Secondly, readers can also feedback their opinions and needs through online and offline methods, including but not limited to the recommendation of books, Information consultation and library facility warranty etc.

3. Realization of Intelligent Book Management System Architecture Based on Artificial Intelligence Technology

3.1 Overall Architecture

ISSN 2522-3488 Vol. 4, Issue 2: 91-96, DOI: 10.25236/IJNDES.040218

The system architecture of the management system designed in this paper is divided into four levels, namely user layer, service and management layer, resource layer and intelligent decision-making layer.[6] The user layer is the module with the largest scope of the management system and the most functions. It needs to be given priority in the design; the service and management layer are the layers controlled by library staff; the resource layer is the module that manages the collection resources. The above three modules have their own situational awareness and data collection modules. The intelligent decision-making layer is the core module of the intelligent library, which needs to reflect the intelligent analysis and decision-making characteristics of the intelligent library. The system architecture of the management system is shown in Figure 1. The specific architecture is as follows:

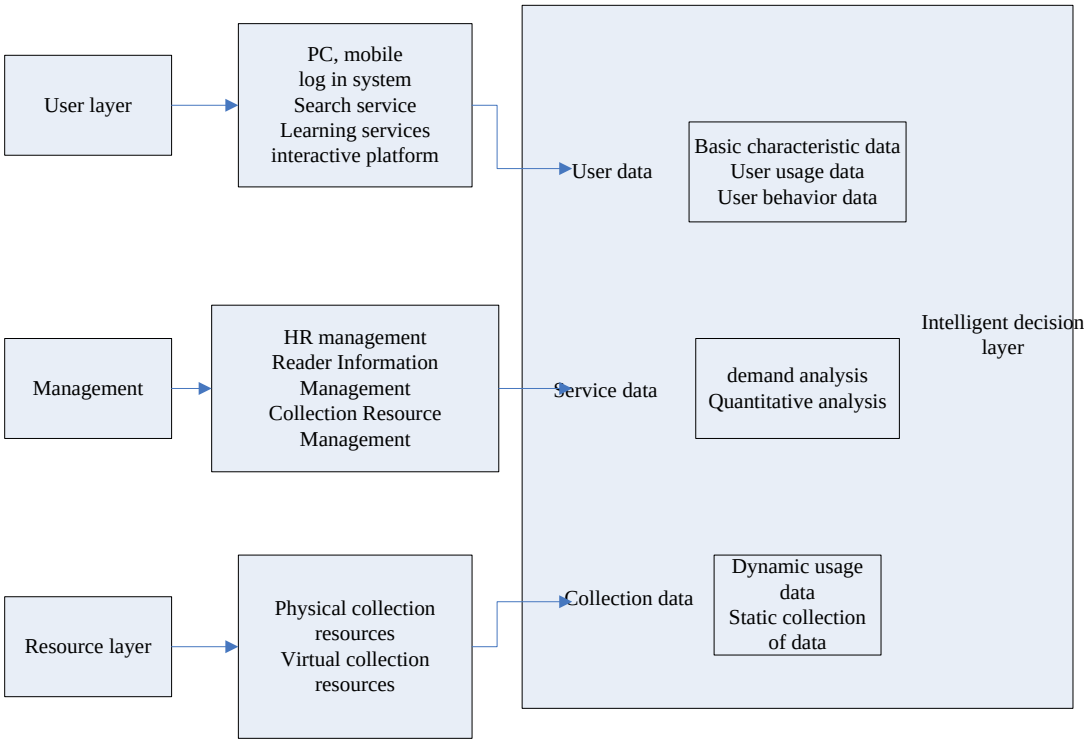

Fig.1 Overall Architecture of the Management System

3.2 Management Implementation

(1) User layer. Including the user's personal information management and the library's data collection module for reader users. The user's personal information management module should be integrated, including reader users' various platforms

ISSN 2522-3488 Vol. 4, Issue 2: 91-96, DOI: 10.25236/IJNDES.040218

in the library (library, mobile library, APP) at the same time, it should have the function of enabling users to call and search for various resources. The user layer can collect activity data such as user usage data and user behavior data [7];

(2) Management. The management layer is the service structure of the library management system facing the library, and it should have the highest authority to manage and adjust the system itself. At the same time, a human resource management module is set up so that the staff in the embassy can conduct horizontal and vertical coordination and communication, and can also collect and analyze the service performance data of the librarian to achieve the effect of supervision. The design of the management layer should introduce intelligent equipment as much as possible, and form an immediate linkage with the user layer and the resource layer to improve management efficiency

(3) Resource layer. The resource layer is a layer that manages the physical and digital resources of the collection. The smart library should increase the importance of virtual resources and reserve equipment and space for storing virtual resources, such as building a virtual resource database. The common OPAC system in the existing library should also be correspondingly improved for intelligence, add the search for virtual resources, and establish a new retrieval system;

(4) Smart decision-making layer. The intelligent decision-making layer is the core level of the intelligent library [8], and it should be able to intelligently analyze the relevant data of the library and make relevant decisions. The basis for decision-making is all kinds of data collected at three levels: user layer, management layer and resource layer. The device support is an intelligent module composed of the Internet of Things, the Internet and AI intelligent systems. The decision-making should include immediate decisions made after analyzing various real-time data, as well as mid- and long-term decision-making recommendations after analyzing some relatively static data.

4. Conclusion

For the research of library management system based on artificial intelligence technology, information extraction and content search are the most important, and it can also meet the needs of the development of the times. Provide new ideas for building a new type of smart library.

Acknowledgement

Project: Research on modern education technology of Jiangsu Province in 2019; Item no.:2019-R-73770.

References

[1] DUAN Shu-ming, ZHANG Wen-jin (2018). Research of Book Management

ISSN 2522-3488 Vol. 4, Issue 2: 91-96, DOI: 10.25236/IJNDES.040218

System Based on PKI [J]. communications technology, vol. 28, no. 1, pp. 164-165.

[2] Lee, Hyo Eun, Yang (2017). Research Trends Analysis of Window Ventilation System Based on Artificial Intelligence [J]. kieae journal, vol. 17, no. 6, pp. 159-164.

[3] Samigulina G A, Shayakhmetova A S (2016). Smart-system of distance learning of visually impaired people based on approaches of artificial intelligence [J]. Nephron Clinical Practice, vol. 6, no. 1, pp. 251-255.

[4] Chen K, Zu Y, Ren W (2019). Research and Design of Knowledge System Construction System Based on Natural Language Processing [J]. International Journal of Pattern Recognition & Artificial Intelligence, vol. 33 no. 2, pp. 524-526.

[5] Xie Z L, Wan C M, Zhang L (2019). Research and Design of Smart Home System Based on ZigBee Technology [J]. Applied Mechanics and Materials, vol. 16, no. 4, pp. 327-331.

[6] Rathore M M, Ahmad A, Paul A, et al (2016). Urban Planning and Building Smart Cities based on the Internet of Things using Big Data Analytics [J]. Computer Networks, vol. 118, no. 2, pp. 63-80.

[7] Fuhe L I, Donglin G, Ningsheng C (2019). Research of Architecture System and Main Technique for Middleware Service Based on RESTful Technology [J]. Ship electronic engineering, vol. 25, no. 3, pp. 3251-3255.

[8] Qiu Y, Zhou G (2018). Research of Pest Diagnosis System Development Tools Based on Binary Tree [J]. International Conference on Computer and Computing Technologies in Agriculture. Springer, Berlin, Heidelberg, vol. 33, no. 4, pp. 59-62.