The design and implementation of book lending system based on RFID technology

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ABSTRACT: With the continuous enrichment of library collection resources and the expansion of service connotation and extension, the traditional integrated management system based on paper resources management can no longer meet the needs of the library’s continuous development. Therefore, the research and development of a new generation of library management system urgently needs to be put on the agenda. the library management and lending system have been already reformed. Finding the relevant literature, comparing and analyzing the previous research results. This paper introduce the design and implementation of RFID technology, including the advantages of the library lending system which established by RFID technology, and at the same time it puts forward the deficiency and the application prospect of the future RFID technology.

1. Introduction
The background of the RFID technology: It is the Abbreviations of Radio Frequency Identification, RFID technology has been used more than 70 years. it is a non-contact two-way data communication, which is used to read and write the recording media (electronic tag or Radio Frequency card) by FRID. we can realize the purpose of identify the target and communicate data. After 2000, people realize the importance of the application of RFID technology, which makes the variety of products made by RFID technology more abundant, the cost of production further reduced, and the application area gradually expanded. RFID technology makes the relevant products into our lives, began to be widely used.

2. What is RFID
RFID is the contactless radio frequency identification technology. It is a kind of high-tech that can collect and process information quickly. It is widely used in business, agriculture, traffic management and so on. Each item has a unique RFID tag. Data is exchanged over the radio between the tag and the reader. The reader processes the data returned from the tag, decodes it, and then sends the data back to the computer system.

3. The working principle of the RFID technology and the realization of the Book Borrowing System
(1) The working principle of the RFID technology: The tag receives the radio frequency signal which the reader sends out, product information stored in the chip is sent out by the energy obtained by the induced current, or the label sends a signal to the central information system of the computer for data processing after reading the information and decoding it through the reader.
(2) Based on the direction of technology, library RFID system is essentially an application information system. RFID user service mode manages document resources through RFID technology
to better serve users. Its work plan is (see below figure 1): document is processed label, input information in the process of cataloging; With the help of RFID technology, the realization of self-help return, inventory, along the shelf, security testing and other functions.

Figure 1 Flow Chart

4. The advantages of establishing a book lending system based on RFID technology

(1) Speeding up the circulation rate of books, improving the work efficiency. Upgrading the technology of document identification with RFID electronic tag instead of bar code, and greatly improving the classification, cataloging and storage of books and documents, it cuts down the cost of libraries and material resources for the library it can be successful to realize the intelligent service of the library. It improves the efficiency of borrowing and returning books as well as the satisfaction of readers to the library.

(2) Prevent books from being stolen and reduce the management cost. The management system of the library using RFID technology has an intelligent security detection system. The security data of the RRID tag information is completed will be modified in the library the books and periodicals with no check-out will be found when they pass through the security door the alarm system will be sound at the same time,. This can reduce the possibility of books be stolen, reduce the cost of books management. In addition, RFID book lending system can be counted how many students go in and out of the library every day. All statistical data can be Automatic generated, this can save the time and energy of libraries. we can manage scientific the library, and perform the specific service mechanism of the library.

(3) The quick shelving, shelving and inventory of books. Using of the feature of the manual reader in the RFID technology system to read multiple labels in batches, Staff only need to scan the shelves near the book and they can find whether there are wrong shelves of books, at the same time, the system can automatically prompt the book should be placed in the right place. During the inventory process, the data from the inventory will be continuously updated in the database, it can accurately reflect the situation of the collection. This undoubtedly saves staff time and reduces the intensity of work, effectively increasing work efficiency. So that readers and staff can accurately find the books, so
as to better achieve intelligent library services.

5. The deficiency of the system using FRID
(1) Personal information privacy. The information media of RFID is electromagnetic wave, which adopts non-contact induction. So when you carry the books and periodicals with electronic tags, maybe you will be tracked and identified. The privacy of personal information is also a concern because the data in the tags can be read without contact with the reader.

(2) The capital of RFID system. It is expensive to use the FRID technology, the price of electronic tags ranges from 0.5 yuan to 1 yuan, but the General Library has one million books or even more, exclude of library infrastructure construction. the amount of money would be required.

6. The prospect of the future application of RFID technology
RFID technology maybe still have some deficiencies, but there is no doubt that RFID technology has been applied in various fields such as clothing retail, aviation, intelligent manufacturing, anti-counterfeit traceability, asset management, intelligent transportation, new retail terminals. According to the prediction, RFID technology will be applied on a large scale and keep the momentum of high-speed development.

With the continuous development of RFID technology and the continuous variety of RFID products and production cost reduction, we believe that it will greatly improve people's quality of life, improve the level of social information.

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