ISSN: 2414-1895 DOI: 10.6919/ICJE.202204_8(4).0036

Application of Hospital Comprehensive File Management System based on RFID Technology

Huanlei Wang[1], Ziyi Ke[2], liang Yin[2,*]

[1] Guangdong Medical University, Dongguan, 523000, China

[2] Beijing University of Chemical Technology, Beijing, 100029, China

Abstract

Hospital archives management is a critical component of hospital archives management informatization, as it offers a foundation for informed decision-making, facilitates information sharing, boosts hospital business management efficiency, and increases hospital business management and control. The widespread use of RFID technology has been advocated in recent years as a result of the development of Internet of Things technology. RFID technology has expedited the process of electronic hospital file management information, which can manage staff, equipment, and case files, considerably enhancing the processing efficiency of information data in the medical system, and lowering hospital administration and costs. The major functions of the system, packaging, and application are for illustration, given the relevance of the current hospital file management system and the fact that it is developed using advanced technologies such as computer technology and RFID technology. The system has been essential in guaranteeing patient safety, enhancing medical quality, and eliminating medical errors.

Keywords

RFID Radio Frequency Identification Technology; Hospital File Information Management; Modern Information System.

1. Introduction

1.1 Overview, Research Background and Significance

1.1.1 RFID Overview

RFID technology, also known as radio frequency identification in English and radio frequency identification technology in Chinese, is a non-contact automatic identification technology that obtains the target's corresponding data and information through the use of a radio frequency identification signal.A complete RFID system is made up of three parts:A reader (Reader), an electronic tag (Tag), commonly known as a transponder, and a software application system are the components of this system. RFID (Radio Frequency Identification) is a radio frequency identification technique for identifying objects that uses electronic tags (Tags). The leader is sent by the radio frequency signal receiving chip, which includes the product information and induces the current according to the collected energy, after the electronic tag enters the magnetic field, and the leader delivers the signal under the active electronic tag. The information is supplied to the application software system for associated data processing after it has been read and decoded at a specific frequency. It is then delivered to a computer platform for users to query after it has been processed. Internal data is changed to reflect this.

ISSN: 2414-1895 DOI: 10.6919/ICJE.202204_8(4).0036

1.1.2 Research Background and Significance

With the thorough reform of medical and health services, the competition between hospitals has become more and more fierce, and the special use value of hospital archives resources, including the confidentiality and utilization of archives, has gradually been recognized by hospital colleagues. The management of the hospital needs to keep pace with the times, and the quality of this work directly affects the construction and development of the hospital, as well as the interests of doctors and patients. Hospital archives record the experience and achievements of the hospital in the process of development, and are an important raw material for the hospital to explore, reform and develop. Hospital Information System (HIS) is widely used in the management of medical departments, effectively promoting the development and expansion of related departments. However, the construction of archives informatization in most hospitals in my country is still relatively backward. There are many types of archives, and the amount of information is expanding rapidly. The traditional file management method has a series of problems such as slow retrieval speed. Borrowing procedures are cumbersome, files are damaged, and they are seriously leaked. This greatly affects and limits the development and utilization of hospital archives resources. The monitoring and management of medical files urgently needs reliable and efficient solutions to overcome various defects of traditional file management.

1.2 Research Status at Home and Abroad

1.2.1 Current Status of Foreign Research

From a global perspective, the United States is the world leader in the establishment of RFID standards and the development and application of related software and hardware technologies, followed by Europe. The Japanese and Korean governments also attach great importance to the development and application of RFID.

1.2.2 Domestic Research Status

Compared with developed countries, Europe and the United States, the development of my country's RFID industry is quite backward. At present, my country's RFID industry lacks key core technologies, especially in terms of UHFRFID core technologies. The limitation of low-frequency rfid technology is relatively low, the application technology of Chinese enterprises is relatively mature, and the entry threshold of UHFRFID technology with a wide range of applications is relatively high. There is a big difference compared to.

1.3 Research Content

In the process of identifying objects with RFID technology, non-contact high-sensitivity automatic identification can be realized, and the required information can be quickly obtained and imported into the database. Under the condition of high precision, RFID technology also has excellent anti-interference ability, and has the advantages of large capacity, high temperature resistance, waterproof, anti-oxidation, and magnetic resistance. In the medical industry, RFID technology has very broad and practical prospects. Through RFID technology, a more intelligent, more convenient and more concise hospital comprehensive file management information system can be designed and constructed. This paper uses RFID technology to develop data collection and computer information technology based on RFID, aiming at the medical archives information management platform of national medical institutions. This system realizes the following functions: (1) Medical files can automatically and effectively record the entire life cycle of the carrier, and realize the orderly information management of medical files. (2) Break the traditional inspection method of medical records monitoring and promote the informatization and informatization of medical records. directed. Standardized implementation.

ISSN: 2414-1895 DOI: 10.6919/ICJE.202204_8(4).0036

2. About the Advantages of RFID-based Hospital Comprehensive File Management Information System

The new generation of information identification technology and RFID technology, as an information management system, will improve the intelligence and automation of the system and bring more benefits. The advantages of the archives information management system based on RFID technology are:

(1) Due to the large amount of information stored in the electronic tags set in the system, the reserved amount of information is increased, and the system users can repeatedly extract and store, thereby prolonging the service life.

(2) The system does not need to manually read and input traditional contacts, but only needs to use scanning equipment to store and analyze information, which greatly facilitates information managers and information users.

(3) The electronic label system used in the system is small in size, easy to be protected, and has a special anti-theft device.

(4) Information identification can be simply completed without direct contact with the device for scanning, so the time for reading data at one time is short, the amount of data processed per unit time is large, and the configuration of the electronic label is simple. Electronic chips can be used for storage.

(5) The energy of the electronic tag also has the advantage of easy transmission of information. When identifying the data in the electronic tag, the data can be read from a long distance, there is no obstacle when reading the data, and the penetration is very strong.

3. Structure Design of Hospital Comprehensive Archives Management Information System based on RFID Technology

After the introduction of RFID radio frequency identification technology into hospital file management, the accuracy, security and confidentiality of file management will be effectively improved, and hospital file management will reach a higher national level. The hospital file management system is shown in the following figure:

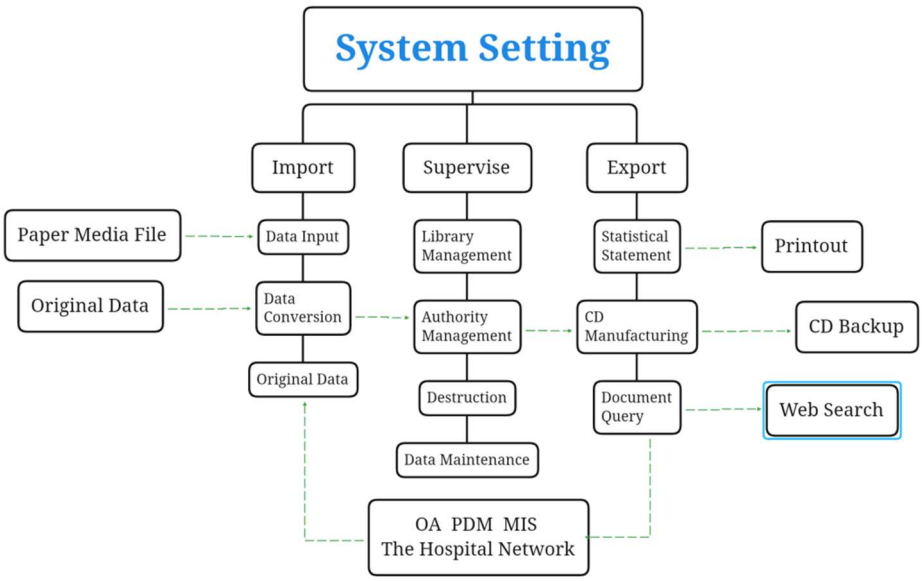

Figure1. The hospital file management system

ISSN: 2414-1895 DOI: 10.6919/ICJE.202204_8(4).0036

Most of the hospital's comprehensive archives management module mainly manages the basic archives of the hospital, including document management, accounting management, technical management, audio-visual management, photography management, physical file management, etc. In the future file management module, all RFID tag information and qualifications will be checked in the hospital's comprehensive file management. The RFTD system realizes the digitization of the file entry business, starting from the daily storage, query, borrowing, returning, security monitoring, file inventory, and specific file query of the anti-theft business, and collecting data in all aspects of file management. Implement management. Automation, intelligence, efficiency.

3.1 File Storage Management

FRID identification technology automatically identifies the file number stored in the module, and the storage number automatically matches the module. This allows you to locate files and manage file access. In addition, the storage location automatic identification module can allocate storage locations, improve storage location management capabilities, and improve the digital level of file management. Before new files can be entered into the archive, they need to be classified according to file classification, specific year, month, security level, etc. In addition, RFID tags need to be written into an intelligent working platform. Content stored on each file label includes file classification, specific name, serial number, security level, entry time, shelf life, and more. When making filing labels, it is best to use RFID-friendly and recyclable paper adhesives to reduce storage costs. This is done as follows: In the Smart Workbench, enter the details of the file label, put the same file into the same file box, and enter a specific entry for the file in the file box label.

3.2 File Access Management

When archiving personnel search for files, they can extract database storage information by querying the file number in the management system. In the process of file digitization, whether you are adjusting roles or returning to roles, information management can be achieved with a simple scan of tags, so that you never miss or successfully scan scans. The electronic file management is connected with the RFID tag information to realize the connection of the interface program. When inquiring, the file is retrieved through the management software, and the system sends the file information to the terminal. File handlers can directly find the files needed for quick file tuning. The filer sends the warehouse instruction accurately and timely, the warehouse management system finds the storage location of the file according to the file serial number, and the storage location indicator light is on. The archive is read by an RFID reader/writer installed on the exit port, and the archiver confirms multiple times that the exit from the library is achieved.

3.3 Destruction and Anti-destruction Management System

The destruction management system sets a specific storage time for each file. At the end of the file retention period, the discarding system starts a discarding process to reduce file resource usage. RFID tags are entered and saved in a database before each file is placed into the file. When the administrator saves the management file, the system will automatically prompt the administrator to discard the file or continue to save it when the storage period is reached. file description. In addition, the RFID radio frequency identification system has the ability to prevent damage and management, and monitor and control the information through the control module. Every time a file is transferred and returned, the file handler checks the physical properties of the file to determine if the file is damaged so that it can be processed in a timely manner.

3.4 File Inventory System

Since we use RFID, archiving inventory is an easy and quick task. When the file management system issues an inventory command, the RFID reader completes the collection and placement of the file box and storage location information, and quickly compares and verifies the central database information and the collected information data. If there is no match, the archiver can change the system information to complete the file inventory job.

ISSN: 2414-1895 DOI: 10.6919/ICJE.202204_8(4).0036

3.5 File Anti-theft Security Control

The comprehensive archives of all hospitals are managed in the RFID tag information management system. Smart File Rack captures file information when retrieving files. If the management system does not send a file for adjustment, but is unattended, the monitoring module is activated and the alarm module generates an alarm. When files are illegally removed from the archives, the intelligent security channel located at the entrance of the archives detects file permissions and provides file system anti-theft processing. After the introduction of RFID radio frequency identification technology, hospital file information management has been updated faster in terms of speed, confidentiality and accuracy, and the utilization efficiency of hospital files has been rapidly improved, becoming a reliable technology for hospital medical services. The theoretical basis is given. Therapy, education, research and management. Provide security and more accurate services for inpatients.

4. Epilogue

To realize the modernization of hospital archives management, we need to ensure the sustainable development of our country's medical undertakings, and archives management is an important part of the modernized information management of hospitals. "RFID-based medical record information management system" is based on the relevant provisions of the "National Secrecy Law". Key executive offices, secret goods storage warehouses, secret goods manufacturing warehouses, carrier storage warehouses, carrier processing sites, carrier destruction sites, carrier production sites, important meeting venues, gender monitoring and management the work has been developed under standardized conditions and has not been computerized. The system is based on the secret content that does not contain secret carriers, equipment or products, and is based on the principles of security, stability, accuracy, timeliness and easy operation. Technology, etc., bind the identity cards of secret-related carriers, equipment, products, secret-related personnel and non-secret-related personnel. Finally, it is recorded through five modules of the system: carrier classification management, equipment and product classification management, confidentiality key departments and personnel management, system configuration, and statistical reports. Accountability Acknowledgment, Traceability and Statistical Goals. The main functions are as follows: (1). Information island processing to ensure information security; (2) RSA encryption technology obtains the hardware information of the monitoring computer and binds it to the unique personnel ID card to realize the one-to-one correspondence between the monitoring computer and the administrator ID card, used for personnel ID card approval management. (3) The combination of RFID technology is used to manage barcode medical files, which greatly improves the accuracy and efficiency of medical file management, innovates the application of RFID technology in the field of medical file management, and monitors file confidentiality. And the management mode has been optimized. (4) Medical file carrier label management, realizing information management of secret-related assets → medical file carrier, realizing traceability and managing secret-related "actions" events monitoring computer secret-related recordability events We have achieved our goals, responsibilities, Traceability, statistical review.

References

[1] Yang Shuhong. Design of hospital comprehensive file management information system based on RFID technology [J]. Electronic Technology and Software Engineering, 2021, (22): 159-160.

[2] Yan Yingbo. Analysis on the application of RFID technology in hospital archives management [J]. Archives Time and Space, 2019, (02): 28-29.

[3] Chen Jun. Analysis of the importance of RFID radio frequency identification technology in the information management of hospital archives [J]. Lantai Neiwai, 2018, (07): 23-24.

[4] Li Juan. Talking about the application of file management system in hospital management [J]. China Health Industry, 2018,15(09):71-72.

[5] Chen Qinggang, Wu Hua. An analysis of the management and service mode of smart hospitals based on the Internet of Things [J]. Modern Hospital Management, 2017, 15(03): 81-83.

[6] Zhao Haijing, Wang Yongfeng, Zhang Juan, Zhang Xinping. Research on hospital archives information management system under cloud computing environment [J]. Electronic Design Engineering, 2017, 25 (09):14-17+21.

[7] Liu Yun. Design of hospital comprehensive file management information system based on RFID technology [J]. China Medical Records, 2017, 18(01): 40-43.

[8] Bao Lei. Design and implementation of modern hospital archives management system [J]. Chizi (first and middle), 2016(03):144.

[9] Wang Ting. Design of hospital comprehensive file management information system based on RFID technology [J]. Electronic Technology and Software Engineering, 2015(12):74.

[10] Zhang Juan. Research on the application of RFID technology in hospital file management [J]. Journal of Texas University, 2014, 30(S2): 90-91.

[11] Wu Di, Cao Yang. Design of hospital comprehensive file management information system based on RFID technology [J]. Archives World, 2014(07):40-42.

[12] Sun Jing. RFID-based medical file information management system [J]. China Medical Equipment, 2014, 29(04): 54-56+70.

[13] YE Qiao, SUN ZiWen. Lightweight RFID Authentication Protocol for Cloud Services using PUF Encryption[C]//Proceedings of the 33rd China Control and Decision-Making Conference (3). [Publisher unknown], 2021:170-175. DOI: 10.26914/c.cnkihy.2021.026949.

[14] Soracom Inc.; "Apparatus, Method And Program For Transmitting And Receiving Data To And From IOT Device" in Patent Application Approval Process (USPTO 20200304973)[J] Internet Networks & Communications, 2020.

[15] Yung-MingChang;MarthandamAsokanShibu;Chih-ShengChen;ShanmugamTamilselvi;Chuan-TeTsai;Chin-ChuanTsai;KannanAshok Kumar;Hung-Jen Lin;B. Mahalakshmi;Wei-Wen Kuo;Chih-Yang Huang Adipose derived mesenchymal stem cells along with Alpinia oxyphylla extract alleviate mitochondria-mediated cardiac apoptosis in aging models and cardiac function in aging rats [J] Journal of Ethnopharmacology,2021.