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Implementation of RFID Solution in Santhiram Medical College, Nandyal, Andhra Pradesh

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ABSTRACT

*According to Dr. S. R. Ranganathans' Five Laws of Library Science fourth law "*Save the time of the reader*". and fifth law "A library is a growing organism". In this Digital era, library grows in size and collection of documents, the problem of library document security and maintenance also growing day by day. For the purpose of library security, and speedy transactions, the library needs Radio Frequency Identification (RFID) technology. RFID has been installed in Santhiram Medical College, Nandyal. This paper discusses the whole process of implementation and installation of the RFID system and the difficulties during the implementation of it. It also covers the advantages and benefits of Radio Frequency Identification in the library.*

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KEYWORDS: RFID, Implementation of RFID, RFID in Santhiram Medical College, Nandyal, Radio Frequency Identification Technology, fourth law of Library Science "Save the time of the reader", library security.

INTRODUCTION

Radio Frequency Identification is a combination of radio frequency-based technology and microchip technology. It is a fast-growing technology for improving library services. RFID uses radio waves to identify objects and items. RFID is automatic item identification and tracking technology. The online RFID Journal describes RFID technology as- "Radio Frequency Identification is a generic term for technologies that use radio waves to automatically identify the individual item. There are several methods of identifying objects using RFID, but the most common is to store a Number or name that identifies a product, and perhaps other information, on a microchip that is attached to an antenna. The antenna enables the chip to transmit the information to the RFID reader. The RFID reader covers the radio waves returned from the RFID tag into a form that can then be passed on to computers that can make use of it."

RFID Technology Reduces the time required for Documents Circulation and search activity. Radio Frequency Technology offers great potential for expanding access to library services. The RFID Technology reduces the valuable time of library staff and Users. RFID Technology can be used in the library for Documents theft detection. RFID is one of the automatic identification and Data Capture (AIDC) technologies. The purpose of such technologies is to identify objects, automatically-collected data about the objects, and update the data into a computer system without human intervention (Potdar Wu & Chang, 2010). RFID does not only help in issue and return of documents but also helps in other library services such as location of Documents, theft detection and stock verification.

The RFID applications are not limited to the Industrial and retail supply chain sector. It has recently been introduced into the library sector as well, to automate the library materials, library services like issue & return of documents. Radio Frequency Identification Technology is an important tool to bring an efficient, secure, fast, and user-friendly approach for material transactions. Many libraries already implemented RFID Technology.

OBJECTIVE

- ✓ To know the implementation process of RFID System in the Library.
- ✓ To know the benefits of RFID technology in the library.
- ✓ To provide suggestions to the library staff for implementing RFID Technology.
- ✓ To know the changes in library services.
- ✓ To know the difficulties while implementing the RFID Technology in the library.

Santhira Medical College & General Hospital, Nandyal

Santhiram Medical College & General Hospital was established in 2004 by Vidyaratna Dr.M.Santhiramudu. It is recognized by the Medical Council of India & Government of India. It is affiliated to Dr. NTR University of Health Sciences, Vijayawada, Andhra Pradesh. It is located at Nandyal, Andhra Pradesh. The college is managed by medical professionals with rich teaching, clinical and research experience with a keen interest to promote medical education and provide quality medical services with a motto of "EDUCATION FOR SERVICE".

The annual intake of MBBS seats is 150 and PG seats is 53.The General hospital has 930 beds with highly Experienced faculty having national and international repute in the field of medical Sciences. With all modern Instructional and Infrastructural facilities on par with the Metropolitan cities.the college procured all required equipment for the clinical and surgical needs of the college and hospital.
Santhiram Medical College, Nandyal spread over a large area of 100 acres, with all modern amenities,

Infrastructure. Air conditioned Lecture theaters, Auditoriums, Laboratories, Examination halls, Animal House, Museums ,Dissection halls and Central Library. The well laid out township with in the campus has facilities like spacious roads, gardens and illumination, landscape gardens, children's park, central water purification and treatment plant, Utility store, social and health clubs, telecommunication facility center, generator facilities, underground drainage system, semi furnished residential complexes with intercom telephone and internet facilities.

separete Hostel facility for UGs, PGs and Senior residents. round-the-clock duty doctors, specialist doctors are available within the campus to attend in emergency.

Website of *Santhiram Medical College, Nandyal* : www.santhirammedicalcollege.com

About Central Library

The Central Library System consists of Central Library and 21 Departmental Libraries. The Central Library is functioning in three storied Separate block. The Central Library is air-conditioned with serene ambience, state of the art infrastructure which provides comfortable learning environment with learning materials academic and research needs of the users and continuously being updated with new volumes of books, journals and electronic resources.

Central Library has collection of 10,898 Print medical text and reference books,133 Print Journals (45 International and 90 National Journals) 160 Dissertations 1300 Back volumes of Journals and 550 CD- ROMS on medical subjects.SC book bank scheme books.

Central Library provides Digital library facility with 50 computers available in the first floor where the users can access the electronic resources subscribed by the Institution.

Santhiram Medical College Central Library is the member in NTR MEDNET consortium where we can access Electronic Books , Electronic Journals, clinical and surgical Videos, drug monographs, CMEs and so on.

Central Library is housed with all modern amenities, and is situated in a magnificent three- storied building covering an area of 5730 square meters. The aim of the Central library is to provide Print resources and electronic resources to support the scholarly and information needs of all the readers, ie Under Graduate Students, Post Graduate Students, Junior Residents, Senior Residents, Faculty members and staff. The Library remains open from 9 AM to 12 midnight on all working days. The library provides various types of services and resources to the users of the library.

Table: Total number of Library Resources as on Nov 2022

Printed Books	10898
E-Books	16006
Print Journals	133
E-Journals through NTR MEDNET CONSORTIUM	1386+
E-Books through NTR MEDNET CONSORTIUM	1183+
Subscribed E-Resources	10
Bound Volumes	1100
Annual Reviews	144
Theses & Dissertations	136
CDs/DVDs	578

Services provided by the library

- Circulation
- E-mail Alerts

- Library Consultation
- New Arrivals Display
- Reprographic service
- Search Request
- NTR MEDNET Consortium
- Web OPAC Service
- Internet Access

Source: Website: www.santhirammedicalcollege.com

1. What is RFID Technology

RFID stands for Radio Frequency Identification. RFID is a combination of radiofrequency and microchip technology. It is used to track, identify the library materials/ documents. RFID is also used for accuracy, stock verification, security control, and control increasing theft. RFID Technology is a combination of Microchip Technology and Radio Frequency Identification based Technology. RFID Invented in 1969 and first used in the 1980s in a Harsh Industrial Environment. It uses wireless radio communications to identify people or objects. library management software helps libraries to maintain library housekeeping operations easily RFID can be used in library circulation operations and theft detection systems.

According to Yu(2008) “Regulating necessary standards, process, and interfaces to fit in with current information systems and extend automatic library operations require continuous efforts".

Liu and Chen,2009: Roberts,2006 explain that “RFID is an electronic information technology that utilizes wireless radio waves to transmit, identify, trace, sequence and confirm various objects”.

2. Component of RFID

RFID Tags: Tags are the heart of the RFID System, it is fixed inside the documents (Books, Journals, Thesis, Dissertations and bound volumes) back cover. Tags contain a chip that can be programmable and an antenna. The chip has a capacity of 64 Bits. Tags are paper-thin smart labels that are electronically programmed with unique information, consisting of an integrated circuit and antenna coil that communicates with a reader using a radio frequency signal**.**

Reader: These components are available in various sizes and shapes. It consists of a transmitter, receiver, antenna, and decoder. It communicates with RFID tags, identify them and receive data link which means the documents (Books, Journals, Thesis, Dissertations and bound volumes) can be issued/returned without opening. The reader powers an antenna to generate a Radio Frequency Field. When a tag passes through the field. The information stored on the chip in the tag is interpreted by the reader and sent to the server, which in turn, communicates with the integrated library system when the RFID system is interfaced with it. (Boss 2004).

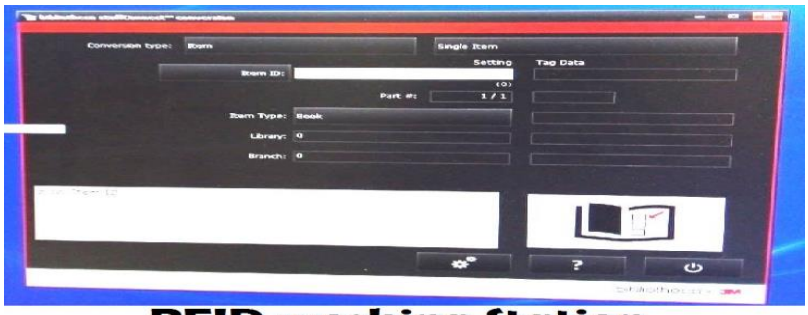
Antenna: The Antenna produces radio signals to activate the tag and read and write data to it. Antenna helps to activate and deactivate the tags. The antenna is the channel between the tag and the reader. RFID Antenna performs two very important functions. First, they transmit power to the RFID tags by activating them, and second, they receive data back from the activated tags. A single antenna can activate and receive data from multiple tags simultaneously

Figure 1 Self issue and return kiosk in Santhiram Medical College Library, Nandyal

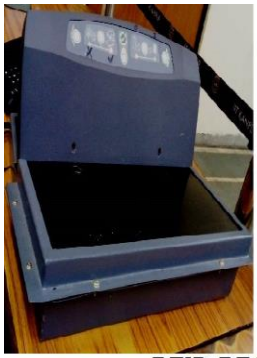
Figure:2 RFID GATES in Santhiram Medical College Library, Nandyal

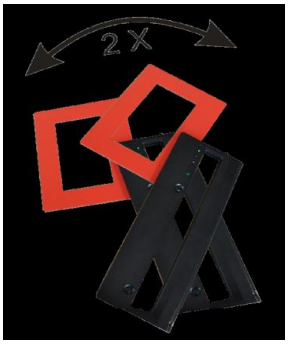
RFID Library Management System

BOOK DROP BOX

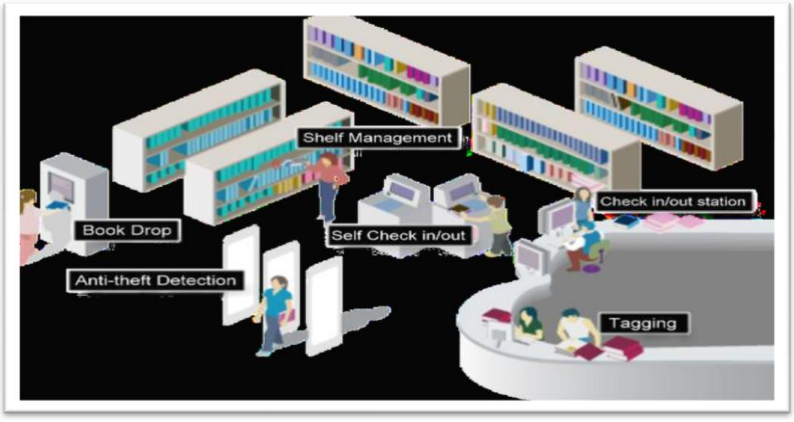


RFID working Station





RFID READER



Installation Process of RFID System in Library

- Collect the Full Information about the RFID Technology. *Ref 9and 10*
- Contact with the Vendors. . *Ref 9and 10*
- Compare the Quotations and Finalize.
- Arrange the Meeting of Committee Members.
- Prepare the Purchase Order.
- Design the Anti Theft Sticker.
- Install the Middleware software and hardware by the vendor.
- SIP2 Server configuration for connection middleware software with the Library management software-KOHA.
- Pasting RFID tags in the documents (Books, Journals, Thesis, Dissertations and bound volumes) and other library materials.
- Pasting Anti Theft Sticker on the RFID tags
- Enter the Unique Number to the RFID tags through Staff Work station (RFID staff terminal).
- Check the documents (Books, Journals, Thesis, Dissertations and bound volumes) and other library materials that the RFID tag is programmed through Staff work station. Software.

Benefits of RFID Technology in Library

- Ability to locate Specific Items.
- Self- check-in & check-out can be done using RFID Kiosk by the user without Library staff intervention
- Check in and checkout in the circulation section by the Library Staff is easy
- More than one item can be checkout and check-in at the same time.
- By using Book Dropbox the checkout process is easy
- Easy to find the misplaced books.
- Library theft control.
- Time-consuming for Library staff and the users is less
- Easy stock verification.
- Faster circulation (RFID Application reduces the amount of time required to perform circulation operations).
- Faster inventory process.
- More than one item can be checkout and check-in at the same time.
- The ability to scan books on the shelves without tipping them out or removing them. Using wireless technology it is possible not only to update the inventory but also to identify items, which are out of proper order.
- By using Intelligent

Suggestion for Implementing RFID Technology in Library

- Before going to install an RFID system in the library, the librarian must complete the stock verification of the library materials. After tagging it is easy to find the total no of tagged books.
- Check the features and the manufacturing country of RFID components before purchasing,
- Ask your vendor to give all the details with the quotation.

- Buy high-quality RFID tags, because once the tags have been pasted on the books they can not easily be replaced. There are many types of RFID tags in the market, so go for high-quality tags.
- Paste the RFID tags on the back cover page of the books. Change the tag position of the RFID tag in every second book's back cover so that the RFID staff station of self kiosk reader can easily read the tags.
- Always try to Buy the RFID components in two-phases: in first phase RFID tags, stickers, Staff Station, RFID Smart cards for users and in other phase - RFID smart card reader, RFID security gate, RFID hand-held reader, Book Drop box and RFID Kiosk.
- Go with the vendor who can give you quick services, consult.
- Contact with the librarians who have already installed RFID in the libraries.
- Sometimes middleware software may not work and your ILMS may also give problem so always try to take a backup of your data
- Provide proper training to the library staff so that they can manage if any problem occurs.

Difficulties during the Implementing RFID Technology

- Lack of Awareness.
- Multiple Errors showing during tagging the books.
- Connection Problem with the RFID Reader and RFID Application.
- Connection with SIP2 server and LMS KOHA.
- Lack of trained Library staff.

CONCLUSION

RFID Technology is not only emerging but also a more effective technology for library security. The RFID tag contains the Unique Accession number for books and alpha numeric Unique Journal Number for Journal Loose Issues, for book bank scheme books alpha numeric Unique number, for CD/DVD alpha numeric Unique number, for Thesis/ Dissertations/Project reports alpha numeric Unique number. Unique User Identification number is provided for Faculty members, Students and Staff separately through RFID enabled Identity cards. RFID technology acts as Security device when the Library materials are not borrowed by the users the RFID gate gives alarm that the Library material is going out without checkout. RFID application supports tracking of materials, improves accuracy, and controls theft.

In this paper, we define the whole process of the library. We also discuss the RFID, its advantages, disadvantages, and the difficulties which are observed by the library staff during implementing of the RFID System. Some of the major suggestions are also provided to the librarians who are going to implement RFID Systems in their Libraries in the future.

In Santhiram Medical College Library, we have completed all the processes of installation of RFID Software and Hardware. We have completed tagging process in just 4 months. The whole RFID System working properly in the library. Self kiosk is ready to help the users to self-check-in and check-out of books.

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