

RFID Technology in Anna University Library Management: A Study

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Abstract

Now a days all libraries follow open access system to promote the use of materials. Due to that there is a chance of missing and replacement of books in the libraries. This is increased in any type of libraries day by day. The traditional method of stock verification is not able to do the work in a systematic way. To over come this problem, RFID technology has been introduced in Anna University for management of library. This paper discusses the need for book checking and managing of library through RFID library management system in Anna University Library. This can be activated by using a new emerging technology known as Radio Frequency Identification (RFID).

Keywords: RFID Library, RFID Management System, RFID tags and RFID Technology.

1. Introduction

New technologies have always been of interest for libraries, both for the potential of increasing the quality of the service and for improving efficiency of operations and security of library management system. At present the libraries of all kinds are facing too many problems to secure the rare and valuable resources from the anti social elements and also an economic hardship the overwhelming reason for considering new technologies in the potential for cost savings in the operations and the management of material flows.

2. Anna University Library

Anna University Library, established in the year 1978 was gained autonomy from December 2000. It is housed in a three storied new Building located at the eastern side in the main campus. The total area of the Library building is about 4122 sq.m. 30 video cameras are placed at strategic points in the library for surveillance. Around 10,157 registered users are in access of the library. Many knowledge-based services like that of Reference, Bibliography, MALIBNET service, Reprography, CD-ROM Databases, Internet browsing and e-services are provided by the library for its users. RFID Technology has been implemented in Anna University Library recently. Library plays an important role in supporting the mission of the University by enabling it to advance, transmit and sustain knowledge and understanding by providing and promoting access to recorded knowledge. Therefore, it is imperative that the Library of this University function as a centre wherein all science and technology information is available.

3. RFID

RFID is a means of identifying a person or an object by using radio frequency transmission. This wireless automatic identification data capture systems allow for non-contact reading or writing of data and they are highly effective in manufacturing and other hostile environments where barcode labels cannot survive. In recent years, the technology has received increased attention due to confluence of events including technology advancements, heightened security concerns, supply chain automation, and a continuing emphasis on cost control within industrial systems.

4. RFID Technology

The most comprehensive application of RFID technology in libraries can be found in Singapore. Libraries in Singapore, under the leadership of the National Library Board, aggressively implemented RFID technology in their libraries. A very large percentage of the public libraries in Singapore are already using RFID technology with remarkable results. The economic case is clear – the use of RFID technology is accompanied with improvements in productivity, better levels of service to patrons, effectiveness of self-check stations and reduction in losses due to theft. The technology, though new to libraries, has been in use in other sectors for more than 20 years. The RFID tags are placed in books and generally covered with a property sticker. Antennas of different sizes, based on application, are used to read the tags and manage the various library functions.

5. Types of RFID tags

There are two types of RFID tags viz. Active or Passive.

Passive RFID tags do not have their own power supply. The electrical current induced in the antenna by the incoming radio-frequency scan provides enough power for the tag to send a response. Due to power and cost concerns, the response of a passive RFID is necessarily brief, typically just an ID number. Lack of its own power supply makes the device quite small. Commercially available products exist that can be embedded under the skin. As of 2004, the smallest such devices commercially available measured 0.4 mm x 0.4 mm, and thinner than a sheet of paper; such devices are practically invisible. Passive tags have practical read ranges that vary from about 10 mm up to about 5 meters.

Active RFID tags, on the other hand, must have a power source, and may have longer ranges and larger memories than passive tags, as well as the ability to store additional information sent by the transceiver. At present, the smallest active tags are about the size of a coin. Many active tags have practical ranges of tens of meters, and a battery life of up to several years.

RFID products are then broken up into different frequencies. Tags and Antennas are tuned or matched much the same way as a radio is tuned to a frequency to receive different channels. These frequencies are grouped into four basic ranges.

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- ◆ Low Frequency (LF)
 - ◆ High Frequency (HF)
 - ◆ Very High Frequency (VHF) and
 - ◆ Ultra-High Frequency (UHF)

6. Problems Faced by Library

Many libraries are facing the following problems.

- a) Increasing theft
- b) Misplacement of reading materials
- c) Poor inventory accuracy
- d) Poor stock verification procedure
- e) Lack of Security control

To overcome all these problems, adopting RFID is the best solution.

7. Implementation of RFID Technology in Anna University Library

RFID - Radio Frequency Identification technology has been implemented in Anna University Library recently. Quotations were received from various firms for implementation of RFID at Anna University Library. Then, sample RFID tags were received from the firms. Simultaneously, demonstrations were provided by the firms to the library users viz. students, staff and research scholars. The remarks of the Library users were considered. Since the performance of M/S Modular Technologies India Private Ltd was good, order was placed with them. M/S Modular Technology employed AUTOLIB for pasting RFID tags in books and journals. The firm installed walk thru Antenna gate at the entrance of the Library. M/S Gemini Traze RFID has provided Mid range reader (RFID reader) which ensures authentication, tracking and security. Unlike EM (Electro-Mechanical) and RF (Radio Frequency) systems, which have been used in libraries for decades, RFID – based systems move beyond security to become tracking systems that combine security with more efficient tracking of materials throughout the library, including easier and faster charge and discharge, inventorying, and materials handling.

8. Borrowing System

The borrowing system allows users to borrow items without assistance from librarian and as a result improves the borrowing function. The borrowing system is a self-service section.

The borrowing system configures to recognize a user by means of:

- ◆ PIN Code (password)
- ◆ Bar-coded identification card and
- ◆ Smart card

9. Advantages due to Self Borrowing

- ◆ Ease of use with assistance
- ◆ Autonomous self-service section.
- ◆ Reduces queue time in library.
- ◆ Reduces manpower in managing the library.
- ◆ Colour indicator to differentiate different items borrowed.

10. Shelf Management

Shelf management solution makes locating and identifying items on the shelves an easy task for librarians. It comprises basically of a portable scanner and a base station.

The solution is designed to cover three main requirements:

- ◆ Search for individual books requested
- ◆ Inventory check of the whole library stock
- ◆ Search for books which are miss-shelved

All these functions are performed by sweeping the portable scanner across the spines of the books on the shelves to gather their identities. In an inventory check situation, the identities collected are compared with the database and a discrepancy report could be generated. In situations when search function is required, whether for a particular item or an item category, the information is first entered into the portable scanner from the base station, and when a foreign item is found on the shelves, a built-in beeper sound to alert the librarians.

11. Anti -Theft Detection

M/S Modular Technology, Chennai has installed Walk Thru Antenna gate at Anna University Library entrance through M/S Gemini Traze RFID Ltd. RFID EAS Gate is the anti – theft part of the RFID Library Management System using the same RFID tags embedded in the library items. Each lane is able to track items of 1 meter or more and would trigger the alarm system when an un-borrowed item passed through them. The alarm will sound lights on the gate will flash as patron passes through with the Library material.

12. Advantages due to Implementation of RFID System.

- ◆ Rapid charging / discharging
- ◆ Simplified patron self-charging / discharging
- ◆ High reliability and accuracy
- ◆ High-speed inventory

- ◆ Automated materials handling
- ◆ Difficult to counterfeit
- ◆ Access multiple applications with one card
- ◆ Long tag life
- ◆ RFID technology provides the fastest, simplest and most efficient method of identifying, locating and managing your media.
- ◆ RFID technology represents a giant lead forwards in productivity, ease of use for staff and user service.
- ◆ Libraries are moving to RFID systems in place of (or sometimes supplemental to) their bar code systems because of the streamlined workflows that become possible.
- ◆ RFID-based circulation systems can process many more books in a shorter period of time with little or no staff intervention.
- ◆ RFID does not require direct contact or line-of-sight scanning.

13. Conclusion

Anna University Library has implemented RFID technology for managing library operations. RFID is complete automatic and transparent, eliminating the need to scan an object manually.

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