



Rfid Technology In Indian Libraries

KEYWORDS

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Introduction

RFID (Radio Frequency Identification) allows an item, for example a library book, to be tracked and communicated with by radio waves. This technology is similar in concept to a cell phone. RFID is a broad term for technologies that use radio waves to automatically identify people or objects. There are several methods of identification, but the most common is to store a serial number that identifies a person or object, and perhaps other information, on a microchip that is attached to an antenna (the chip and the antenna together are called an RFID transponder or an RFID tag). The antenna enables the chip to transmit the identification information to a reader. The reader converts the radio waves reflected back from the RFID tag into digital information that can then be passed on to computers that can make use of it.

RIFD for Libraries

RFID (Radio Frequency Identification) is the latest technology to be used in library theft detection systems. 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?

RFID is a combination of radio -frequency-based technology and microchip technology. The information contained on microchips in the tags affixed to library materials is read using radio frequency technology regardless of item orientation or alignment (i.e., the technology does not require line-of-sight or a fixed plane to read tags as do traditional theft detection systems) and distance from the item is not a critical factor except in the case of extra-wide exit gates. The corridors at the building exit(s) can be as wide as four feet because the tags can be read at a distance of up to two feet by each of two parallel exit sensors. [The devices used for circulation and inventorying are usually called "readers" while the ones used at building exits are usually called "sensors."]

The tags or targets used in RFID systems can replace both EM or RF theft detection targets and barcodes, although the system that 3M introduced in 2000 replaced only barcodes in the belief that EM is superior to RFID for security. [3M did introduce a comprehensive RFID product that replaces both EM and barcodes in 2004]

Components of RFID System

The RFID System is made up of few essential components. These components should work synchronously in order to achieve reliable data transmission and reception.

1. RFID tags that are that electronically programmed with unique information.
2. Readers or sensor to query the tags.
3. Antenna.
4. Server on which the software that interface with the integrated library software is loaded.
5. Reader Interface Layer.

RFID Tag:

A tag is a transponder mounted on a substrate that is programmed with information that uniquely identifies itself. Tags are activated when they pass through a radio frequency field - the RF field produced by the antenna of the reader.



RFID Reader/Scanner

A reader (also known as transceiver or interrogator) handles radio communications through the antennas. A reader can transmit signals to a tag, synchronize a tag with the reader, and interrogates all or part of the tag's contents. In short, the main purpose of the reader is to transmit and collect information.

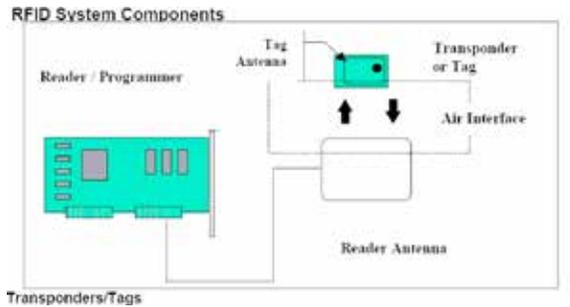
RFID Antenna

An antenna consists of a coil with one or more windings and a matching network. The primary purpose of an antenna is to radiate the electromagnetic waves produced by the reader, and in the same manner, receives RF signals from the transponder.

Reader Interface Layer

This interface layer is used as a conduit between the RFID

readers and hardware elements or devices such as desktop computers and laptops that are capable of communicating with the readers and accepting information from it.



Other Components of RFID

Optional RFID system includes the following three components.

1. RFID label printer.
2. Handheld reader/Inventory wand.
3. External Book Return.

RFID label printer.

An RFID printer is used to print the labels with an individual barcode, library logo, etc. when the print is applied; it simultaneously programs the data into the chip. After this process, the RFID label is taken from the printer and applied to the book.

Handheld reader/Inventory wand:

The portable handheld reader or inventory wand can be moved along the items on the shelves without touching them. The data goes to a strong unit, which can be downloading at a server later on, or it can go to a unit which will transmit it to the server using wireless technology. The inventory wand will cover three requirements:

- Screen the complete book collection on the shelves for inventory control;
- Search for books which are not properly shelved.
- Search for individual book requested.

External Book Return:

It can also offer a distinct service that is very useful for users, such as the ability to return books, when the library is closed. An external book return is a machine with a slot with a chip RFID reader integrated into the wall. It works in the same ways as the self checkout station. The user identifies himself/herself (if required by the library), and then puts the book(s) into the slot. Upon completing the return, the user will receive a receipt showing checked in; they can go directly back into the shelves. The units can also be used with sorter and conveyor systems (Sahid, 2007)

Key Features of RFID in Libraries:

The reliability of the system, its ease of operation, and the flexibility of tagging all kinds of media easily, are important criteria in choosing an RFID system. The main aim for today's libraries in adopting RFID is the need to increase efficiency and reduce cost. Automation and self-service can help libraries of all sizes achieve these aims, and RFID has the added advantage that it can also provide security for the range of different media offered in libraries. The technology can also improve circulation and inventory control which helps allocate human and financial resources. This means that libraries can relieve their professional employ-

ees of routine work and operational tasks. All of tags used in RFID technology for libraries are passive. The power to read the tags comes from the reader or exit sensor (reader), rather than from a battery within the tag. A few libraries use "Smart" card, which is an RFID card with additional encryption, is an alternative to merely adding an RFID tag on staff and user identification cards (Boss 2004). Not only does that identify users for issue and return of library materials, but also for access to restricted areas or service. This would make it possible to make it into a debit card, with value added upon pre-payment to the library and value subtracted when a user used a photocopier, printer, or other fee-based device, or wished to pay fine or fees.

Merits of RFID Technology in Libraries:

The major merits of RFID technology in libraries are as:

- Ability to manage the expanse over a number of years.
- Staff can exploit their profession skills as applied to clerical skills.
- Miss-shelved reports.
- More than one item can be checked out or checked in at the same time.
- Long life of tag.
- Fast circulation.
- Easy self charging/discharging.
- Fast inventorying.
- Greater reliability.
- Automatic material handling.
- Economical.
- Automated issue/return.
- Easy stock verification.
- Automated sorting of books on return.
- Improve the security function in library.
- Instant update of database is possible.

Demerits of RFID technology in Libraries:

The demerits of RFID technology in libraries are as:

- Frequency block.
- High Cost.
- Lack of standard
- Accessibility to compromise.
- Removal of exposed tags.
- User privacy concerns.
- Exit gate sensor problems.
- Reader collision
- Tag collision
- Interoperability.
- Lack of proper standards and protocols, it need to be unique and inter-operable.



Benefits of RFID technology system

Times saving, fast accessing of books and eliminating manual errors are the main benefits of the RFID in library. Although RFID can be used in library anti theft system this does not mean that it is a highly secure technology. The library save some time in processing new items because it only has to affix one technology to the item. It may also save some money due to the integration of circulation and security with single vendor and into a single system. RFID improve library workflow, reducing non-value added work process, improves staff productivity, assist traceability of book allocation. Ability to locate specific items, faster inventory process. More than one item can be checked out or checked in at the same time, improve customer service, Higher staff job satisfaction with correct and reliable shelving order, Financial reduces costs of replacing stock reliable knowledge of stack location.

Library RFID technology system libraries in India

Several libraries have successfully installed the RFID system in India. Some of the them are:

- IIM Shillong
- Anna University, Chennai
- BCL, Delhi
- IIM, Indore
- NASSDOC, Delhi
- NCL, Pune
- IIT, Delhi
- NIT, Surat
- Parliament library, New Delhi

Some Vendors of Library RFID technology system

- LibSys Corporation, Gurgaon
- Total It solution, New Delhi
- 3M Lib system, New Delhi
- RFID Info Tech, Mumbai
- Edutech, Chennai
- Mantra softech (India) Pvt Ltd.
- VTLS Software, Noida

Conclusion

This technology has slowly begun to replace the traditional one. The RFID tag can contain identifying information such as a book's title or material type, without having to be pointed to a separate. The information is read by an RFID reader, which replaces the standard barcode reader commonly found at a libraries circulation desk. The RFID tag found on library materials which it can also act as a security device, taking the place of the traditional electromagnetic security strip. The cost of the technology is main contain. RFID technology is not only emerging but also more effective, convenient and cost efficient technology in library security.

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