

## Implementation of RFID Technology in Higher Learning Institutions

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### Abstract

The impact of new information and communication Technologies has revolutionized every walk of life. During last few decades the dimension and approach of information seeking behaviour of library users have tremendously changed from book materials conventional sources of information to audio - visual modes of information sources and their dissemination and retrieval. The users want any sort of information related to this curriculum or of their areas of interest instantly. Only adopting the new gadgets of information technology, multimedia, CD-ROM & INTERNET connectivity needs can fulfill their information.

**Keywords:** RFID:Radio Frequency Identification; Higher Learning Institutions.

### RFID : An Introduction

RFID stands for Radio Frequency Identification. This technology uses radio waves to track and identify objects. RFID has existed for decades but until recently the technology was too expensive for widespread application

The implementation of RFID in Indian Scenerio is very less that only universities, Institution funded by Central Government and some other private Institutes. The system consists of a RFID transponder and a reader

#### *RFID Transponder Tag*

The transponder is affixed to the item you want to track. It consists of an antenna and a microchip encoded with unique information that will identify the item to the RFID Reader. Tags are often embedded in packaging or encased in protective plastic for weatherproofing and greater durability.

#### *RFID Reader*

The reader transmits radio signals at a preset

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frequency. Any transponder tags that are in range of the reader will pick up on this signal and send the information stored on the microchip back to the reader. Because transponders derive their power from the field generated by the reader, they do not operate unless they are in the vicinity of the reader.

RFID systems also require a means for data collection. A computer takes the information received from the reader and converts it into a form that is meaningful to the user.

#### *Usage of RFID*

### Current Method

The majority of libraries identify their material by barcode.

The barcode is affixed to the book (usually on or inside the cover) and each barcode is individually scanned with a laser beam. The barcode carries only one item of information, usually an identification number that is linked to an item record in an integrated library system.

Contrary to many patrons' belief, the barcode has nothing to do with security. Rather, a magnetic strip (aka tattle tape) is inserted in each individual item and this strip sets of an alarm if the item has not been charged to a patron and desensitized.

RFID can be used for both inventory and security.

Not only is it possible to program an identification

number into the microchip, other information can be included such as a book's title and call number. The tag could also track if the item is out on loan and the due date. In terms of security, RFID readers installed at the library's exit could pick up the signal emitted from the embedded tag. The system could then query the integrated library system to determine if the item has indeed been signed out. Alternatively, a "security bit" embedded in the tag could, like tattle tape, be turned off by circulation staff when the item is charged. When the patron leaves the library, security gates would detect if the patron's items were properly signed out. Upon return, the item's tag would be reset.

Implementation of an RFID system requires a migration of existing information to the new system. A programming station is used to encode the microchip with the old barcode number or any other identifying information a library chooses to include. The tag then has to be physically placed on each book.

#### *Category of RFID Systems*

The RFID systems can be categorized into basically four systems

- Electronic Article Surveillance
- Portable Data Capture Systems
- Networked Systems
- Positioning Systems
- One new system of RFID is coming into being is the combination of all the above systems

#### *Advantages of using RFID*

##### *Quick Service*

RFID systems can read multiple tags at a time. This allows for several items to be checked out at once. Increased use of self-checkout stations could be a consequence because users do not have to carefully line up individual item barcodes for scanning. The self-checkout can be designed to be easy to use and can be programmed to display instructions in multiple languages.

##### *After Hours Service*

External book drops can be equipped with an RFID reader. The library patron identifies him/herself with a library card and then returns the books through a slot. The books are automatically discharged and a receipt showing which books were returned is produced.

##### *Tag Lifespan*

Compared to barcodes, RFID tags have the potential to be longer lasting. To be read by a laser beam, barcodes need to be placed in a clear line of sight. This makes them vulnerable to peeling and general wear-and-tear. In contrast, RFID tags can be read no matter where they are placed and consequently they can be inserted (or even hidden) inside a book.

##### *Inventory Capabilities*

RFID tags can be read while the book sits on the shelf. Staff can use a hand-held reader to walk down the aisles and detect items that are out of order or missing. This makes it much easier to find "lost" books. The reader could also be used for collection development and weeding

##### *Security*

RFID systems can track items that are moving out of the library.

##### *Reduced Ergonomic Stress*

staff no longer have to sort and discharge each individual item

##### *Increased Efficiency*

This technology has reduced the time it takes to get books and other materials back in circulation after they've been returned

#### *Disadvantages of Using RFID*

##### *Size*

The RFID tag is large, about two inches square. It can be awkward to affix these bulky tags to CDs, sheet music, pamphlets and other delicate materials.

##### *Tag Collision*

If journals or other particularly thin items are stacked, there is a risk that the close proximity of the RFID microchips will cancel each others' signal out. If a patron has a stack of materials to borrow, the system might not accurately sign-out each item.

##### *Interference*

RFID signals can be disrupted by the surrounding environment. Metal and fluorescent lights are

potential impediments and as a result library space, such as the sorting room at the Seattle Public Library, must be carefully planned

#### *Lack of standard*

The encoding on the transponder tag and the software that processes the information are not always compatible between vendors. This means that if a library wishes to switch vendors, staff may have to retag all items.

#### *Cost*

The cost of issuing a new RFID library card to every patron can be prohibitive, especially in larger library systems. RFID tags also cost more than barcodes. There is also the cost associated with paying staff to tag all the library's holdings. Like other emerging technologies, however, the cost could decrease as the RFID technology in libraries becomes more prevalent.

#### *Security*

A thief can block the RFID signal by lining a bag with household aluminum foil. While tattle tape has traditionally been hidden, a visible RFID tag could be ripped off and the item stolen without detection.

#### *Vulnerability*

The RFID signal is unencrypted. If a library uses rewritable tags, a hacker could potentially overwrite the code on the tag and confuse the system. RFID Implementation: Some things to Consider.

Introducing RFID technology to a library takes dedicated research, careful planning and time.

#### *Expectations*

One needs to consider what specific needs this technology will fulfill. Does your library need better security? A more efficient way to inventory a large collection? Will RFID be used with other technology such as an Automated Material Handling System or an Automated Storage and Retrieval System? All of these needs will affect planning and decision making.

#### **Conclusions**

Many modern technologies give the impression they work by magic, particularly when they operate automatically and their mechanism are invisible. The RFID technology has exactly this characteristic and for many people seems a lot like magic. The major advantage of RFID implementation from the security aspect of view is keenly being taken into consideration by decision makers, making better chances for the RFID in Indian Libraries.

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