



**IMPLIMENTATION OF RFID TECHNOLOGY IN LIBRARIES FOR
EFFECTIVE AND EFFICIENT FUNCTIONING OF LIBRARY
OPERATIONS**

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Abstract:

The challenging task of libraries is to perform circulation function and shelving operation, as it consumes much time and requires more staffs. The RFID technology provides the solution to such problems. Radio frequency identification is one of the useful and fast growing technologies used in many libraries. Radio Frequency Identification, RFID is a radio wave technology used to identify the item or objects automatically. The paper covers the components of RFID technology. It also discusses how RFID technology is differs from barcode system. This article emphasizes the advantages of RFID implementation in library as it helpful in circulation process (self check-in/check-out), anti-theft detection, shelving operations, inventory control system and other library management. This technology provides the effective and efficient management of library operations. The articles also point out some disadvantages of the technology. Working areas of RFID in libraries have also been listed in this research paper.

Keywords: *RFID, Barcode, Tag or smart label, Library operations, circulation patron, Anti-theft detection.*

Introduction:

Development of new inventions and innovations in science and technology provoke the libraries to implement modern technologies to manage and functioning the library resources and services. Now a day's it is necessary to adopt new innovations and technologies to provide better services to the user. In recent year's library operations, service providing methods, Information dissemination pattern, and circulation function has been changed drastically with the applications of new technologies. Security and maintenance of resources are the

challenging task of the library. All higher education libraries are focuses on the safety and security of the library resources. Several technologies have been adopted in order to maintain modern library operations. Radio Frequency Identification (RFID) is one such techniques widely being applied by many modern libraries. RFID provides more effective and efficient functioning of library operations and protect books from theft. RFID technology is the automated library system for tracking and identifying the library materials and it can be used in circulation operations, theft detection process and

efficient tracking of library materials. This technology will help to reduce the time spent for charge and discharge of materials in the library. RFID technology can replace the traditional system of circulation to the modern way of check-in/check-out without the intervention of library staffs.

RFID- Meaning:

Radio Frequency Identification, RFID is a radio wave technology used to identify the item or objects automatically. RFID technology is quite similar to barcode technology; however the RFID technology will fulfil the limitations of barcode system. RFID contains the tag or smart label and interrogative devices (Reader, antenna). Antenna will read the radio frequency and transfer the information to the reader. The RFID contains essential elements (tag, reader, antenna, and server) and other sub elements. RFID technology tracks the object by using radio waves.

How RFID Works Better Than Barcodes:

RFID is an automated identification technology, which covers the limitations of barcodes. Barcode system provides the connection between the information system and the physical operations of library materials. Radio Frequency Identification built with major elements which help to work effectively in the library system. Tag is the heart of the RFID system which kept inside the books or materials to locate exactly where it is. RFID technology is similar to barcode system but the main difference between RFID and barcode is that barcode requires a direct line of sight to the printed barcode but RFID need not require the line of sight reading. Both RFID and barcode

technology will carry the information of the materials. However RFID technology overcomes the limitations of barcode. The information read from RFID tags are much faster than from barcode system. In barcode systems reading is much more time-consuming process as it needed line of sight to scan the materials. But in RFID technology the reading is faster than barcode. Barcode reader has no read/write capability, that is, they cannot add the information written on printed barcode. However radio frequency identification system can be read/write capability. RFID technology uniquely identifies each material. Barcode technology cannot identify the materials uniquely, usually it only identify the type of materials. Though RFID and barcodes have similarities as they are collected the data, identify the materials. This technology is facilitating the effective and efficient operations in library system.

Components of RFID System:

RFID technologies are made up of several components. The main components of Radio Frequency Identification system are as follows:

1. RFID Tag Or Smart Label:

RFID tags or smart labels are basic and essential components to the whole operations of the RFID system. These are the small plastic elements, which can be fixed inside the books and other materials. Most RFID tag contains a microchip, But some tag are doesn't contains chips. The tag receives the signals from the reader. These tags speed up the circulation transaction in the library.

2. RFID Antenna & Reader:

RFID antenna and reader are the interrogative devices in the system.

Antenna is the integral part within the RFID reader, which connects the link between the reader and the tag. Reader is an electronic device used to communicate with RFID tags. RFID reader and antenna are the key elements in the system.

3. **RFID Printer:**

RFID printer is used in convergence with the RFID tags. These are used to print the label and also write the tag.

4. **Server:**

Server is the important elements in the system. It connects the link between the reader and the automation system. Server is the arch among all components. It receives the information from readers and exchange information with the database. Generally the server includes a transaction database and it can easily produce the reports.

Major Working Areas in Libraries:

Recent development in ICT contributed the new way of operations in the library. RFID technologies are adapted in the following areas in library.

- Circulation section
- Shelf management system
- Library security system
- Book Drop or return station
- Self check-in / check-out
- Anti- theft detection
- Inventory control system

Advantages Of RFID In Library Operations:

The significant advantages of RFID devices are as follows:

- The using of RFID technology will reduces the amount of time

required to perform the circulation transactions.

- The user can easily check-in/ check-out without the intervention of library staff.
- The RFID technology is highly reliable.
- The RFID system has its ability to scan all books without removing them from the shelves.
- The high speed inventory feature is very useful in stock verification where much time is wasted in manual system.
- Another advantage of RFID technology is automated moving of library materials.
- RFID technology provides the value added service to the users.
- Identifying and locating the materials on the shelves is easy task for library staff by using this technology.
- RFID technology will reduce the queuing time as the users themselves charging and discharging the books.
- The RFID technology acts as a security gateway in the library, as the anti theft detection features trigger the alarm when a un-borrowed item passed through the exit gate. This will avoid the loss of books from theft.
- RFID does not require the direct line sight for scanning the items.
- Stock verification and rectification can be done easily.

Disadvantages:

However, the radio frequency identification has some following disadvantages.

- The major disadvantage of RFID is its high cost. This system requires

more money to implement in the library. All libraries cannot offer it.

- As the user knows the role of RFID tag, there is a chance of removal of exposed tag from the book.
- Sometimes exit gate sensor is more problematic.
- It requires well knowledge and careful alignment of technology.
- The demerits of RFID are lack of standards. The pattern of encoding information and software is differs from one vendor's system to another. The changes would require retagging of all items or modify the software.
- Placing two items against one another create a fault in an RFID system, so that one tag overlays another. It may cancel the signals.

Conclusion:

RFID will helps in automated check-in & check-out in the library without human interventions. Even stock verification process, tracking the library materials, self-rectification and theft detection and many more activities of the library can be done by implementing of RFID technology. This technology will helps to reduce the time spend for charge and discharge of materials in the library. RFID technology provides the effective and efficient circulation function and library inventory control system. This technology having many advantages than the barcode system, but the high cost, non-availability of standards, removal of exposed tag are the major drawbacks in implementation of RFID technology in many libraries. Further the libraries need to conduct the training and user awareness programmes to the users for better and efficient use of RFID technology.

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