

# Use Of RFID Technology In Libraries

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## **Abstract**

Radio Frequency Identification technology is one of the latest trends used in the field of libraries, bringing a revolution in library operations and services. This manuscript focuses on the use of this technology in libraries. It is an attempt to provide a detailed idea of utilizing RFID in libraries, its benefits, challenges and issues which are encountered during its implementation in a library.

**Keywords:** RFID, Components of RFID, Applications, Benefits, Challenges, Issues.

## **1. Introduction**

The acronym RFID, which stands for Radio Frequency Identification, refers to a technology that utilizes radio waves to identify and track tags tied to some objects. This modern technology is a combination of radio-frequency based technology and microchip technology. In this technology, some microchips containing information are tied with some objects which can be read by using radio frequency technology. This technology is extensively used in commercial and industrial areas including library also. It facilitates a wide range of advantages for its users. In this study, we will discuss about RFID system, its application in libraries and the challenges and issues that come while adopting it in a library.

## **2. Components of RFID**

Basically a RFID system has three components, which are

1. An antenna or coil
2. A transceiver (equipped with decoder)
3. A transponder (RF Tag) is electronically programmed with unique information.

All these three components of an RFID system work in two cooperative ways. The transceiver (transmitter/ receiver) and the antenna functioned together as an RFID reader. On the other hand, the transponder (transmitter/responder) and the antenna are called RFID tag together. In the working scenario, the reader emits a radio signal which activates the transponder and it delivers back the stored information contained in it to the receiver thus the reader can read the stored information.

Again, there are two kinds of transponders or RFID tags. One is passive transponders which don't have their power source. Passive tags are cheap and are powered by the electromagnetic energy transmitted from an RFID reader. The other one is Active tags which have their supply and uses it to generate a signal in reaction to the reader. These tags are costly and can communicate over a large distance.

### **3. RFID in Library Management System**

A library expects to deliver its services effectively and efficiently. It mainly focuses on satisfying its users. In most cases, it is observed that a library is not able to deliver its services as per its goals due to the lack of staff compared to an increase in the user community. Few libraries are taking more time to provide their services. In these cases, RFID technology can be a blessing for such libraries. RFID technology is utilized in libraries to automate the circulation and in the management of library collection. RFID technology in the library brings pace to the circulation section, increases the accuracy of the shelving function. Moreover, it ensures the protection of the library collection also. This RFID technology is beneficial for both the library users as well as the library patrons.

### **4. Applications of RFID in library**

#### **(a) Book Drop**

A library can provide a book drop facility within or outside of a library by using RFID technology. The location of book drop can be anywhere; it can be located in train station or market also. The users can return the books at book drops at any time of the day, even after the closing time of the library. This book drop facility helps easy returns books.

#### **(b) Shelf Management**

It becomes an effortless task for a library professional to identify and track down items on a shelf with the implementation of RFID technology in the library. With the help of the RFID system, a portable scanner and a base station; the library professionals can do the following tasks very conveniently -

- (i) Locate any items/books requested by a user
- (ii) Library stock verification
- (iii) Identify the items/books which are misplaced

#### **(c) Anti-Theft Detection**

Electronic Article Surveillance Gate (EAS Gate) is another feature of an RFID system, used for anti-theft detection purposes. It is equipped with an alarm system and it makes noise when someone passes through the gate with an un-borrowed item tied with an RFID tag.

#### **(d) Self Service**

A library having an RFID system supports a self-service system. A user can do library activities like book borrowing, return, reservation, and enquiries on their own in a library with an RFID system. Moreover, it takes less time to do so and is very time-saving.

**(e) Tagging**

An RFID tag can store information in it. This feature enables to provide information about an item tied with an RFID tag in a library such as - its loan status, loan history, proof of ownership, location and many other things. The information stored in RFID tags can be Benefits, rewritten without even touching it.

**5. Benefits of Using RFID**

The benefits one can get by utilizing RFID and what distinguishes it better in comparison to other techniques are discussed below.

- (a) RFID system reduces the man power requirements in library activities.
- (b) RFID system doesn't require human intervention to read RFID tags. It reduces human errors.
- (c) The information stored in RFID tags can be read so fast compared to barcode technology. This it saves times of the users.
- (d) RFID systems support self-service systems. Users can do normal library activities like-issue, return, and enquiry by themselves. This it saves the time of the patrons also and they can dedicate this additional time in other library activities.
- (e) Several tags can be read at a single time.
- (f) RFID tags can be equipped with sensors also.

**6. Challenges and Issues in Implementing RFID in Library**

The practice of RFID in libraries brings many privileges. However, several libraries are not going after it. There are a few issues or challenges that compel them to repel from it.

**(a) High Cost:**

It is not feasible for a library with a small budget to adopt the RFID technology in their library as it needs a high cost. The whole RFID infrastructure, the necessary hardware and the software required for the adoption of RFID are expensive and their maintenance is costly too. A library needs to execute a cost-benefit analysis before implementing RFID in its library.

**(b) Privacy:**

An RFID system can detect all the activities of the library user including issues- return, browsing, reading etc. So, privacy is one of the issues that several libraries don't prefer to adopt RFID in the library.

**(c) Technical Issues:**

Several technical problems may arise in an RFID system. Some notable technical problems are- abnormal signals influenced by environmental differences, interference caused by the other high electromagnetic waves, interference made by some metals or fog, the distance between reader and tag, compatibility between tags and readers, lacking adequate hardware etc.

#### **(d) Standardization**

The way of implementing RFID technology is varied for different manufacturers. There is no global standard of specifications of RFID equipment, standards of RFID tags, RFID regulations etc.

#### **(e) Technical Experts**

Lacking technical experts is another concern in implementing RFID in libraries.

### **7. Conclusion**

The RFID system is a boon for any modern library and information centre. Its advantages have made it popular among library professionals. It makes many library activities easy and convenient for users and library professionals. This technology makes circulation works very fast and saves time for the user. This system lessens manpower requirements in the library and thus saves the funds for the library. Also, it reduces human errors by lowering human intervention in many library operations. Although this technology has many benefits, there are certain issues and challenges in implementing it in a library, we hope these can be overcome in future.

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