

# SMART MANAGEMENT OF BOOKS

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**ABSTRACT :** RFID based Library Management System is a unique system to be implemented in libraries to manage the books automatically. RFID system are become very popular because it reduce the theft without human effort. It will use the RFID reader to identify and manage the books efficiently. This system able to issue and return book via RFID tags and also calculate the corresponding fine. The proposed system is based on UHF RFID readers, supported with antennas at gate and transaction sections, and library cards containing RFID-transponders which are able to electronically store information that can be read / written even without the physical contact with the help of radio medium. RFID is a rapidly emerging technology which allows productivity and convinience.

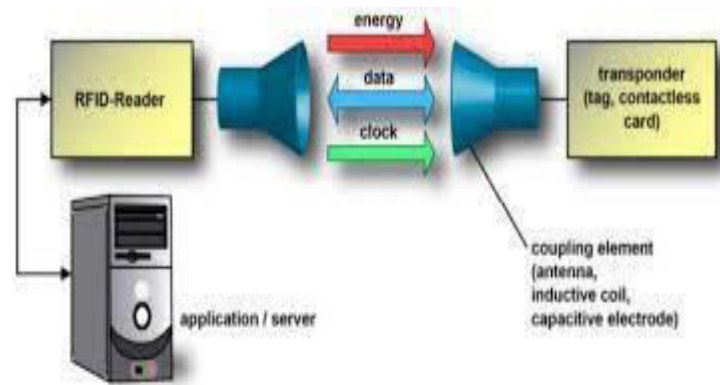
The proposed system is based on readers and passive RFID tags that are able to electronically store the information that can be read with the help of the RFID reader. this system would be able to issue and return books via REID tags and also calculates the corresponding fine associated with the time period of the absence of the book from the library database .

**Keyword :**RFID, Library security, Tag, Theft detection.

## I. INTRODUCTION

RFID is a rapidly emerging technology which allows productivity and convenience. RFID is a automatic technique that is used for the fast transaction of books. Here we are going to develop library automation system, which will track the books, whether they are issued or they are in library, so that library user will get the instant information. RFID can be used library circulation operations and theft detection systems.

This technology helps to the direct send of information from tags to the PC of the librarian and it is automatic update in the user account. Tags of RFID can be programmed in unique code. This code gets read when this is passing through the RFID reader, When the tag is crosses the reader then the reader is update a new code and also update the user account. This technology helps librarians reduce valuable staff time spent scanning barcodes while charging and discharging items. RFID is one of the most technologies being used by both industry and academic world. using RFID tags library, is easy and convenient .A RFID library management system consist of books, each attached with an RFID tags, RFID reader, computer network and software, library staff handle lending, returning, shorting, tagging etc. A person can loacte RFID library books market with the RFID tags,using the RFID reader which identifies and locates the books. when the book is carried to the counter, the library staff can either activate or deactivate the electronic article sueveillance bit in the book's tag,



## II.RFID in library

A library is a collection of information, sources, resources, books, and services . CDAC Library is a large one having 17,000 books and staffed by both paraprofessionals and professional librarians. The following are the task to be performed in the library

- Circulation: handling user accounts and issuing/returning and shelving of materials.
- Collection, development, order materials, maintain materials' budgets.
- Technical Services work behind the scenes, processing new materials.

Searching a particular book to check its presence in the library Locating the physical location of the book Accounting/Stock verification of the materials The RFID based LMS facilitates the fast issuing, reissuing and returning of books with the help of RFID enabled modules. It directly provides the book information and library member information to the library management system and does not need the manual typing. It also provides monitoring and searching system. The monitoring module will continuously monitor the movement of books across the gates, so that the books taken out without prior issuing will be traced out easily and will alarm the librarians. The searching module provides the fast searching of books using RFID handheld reader. The physical location of the books can be easily located using this module.

To remove manual book keeping of records Traceability of books and library members as they move Improved utilization of resources like manpower, infrastructure etc. Less time consumption as line of sight and manual interaction are not needed for RFID-tag reading.

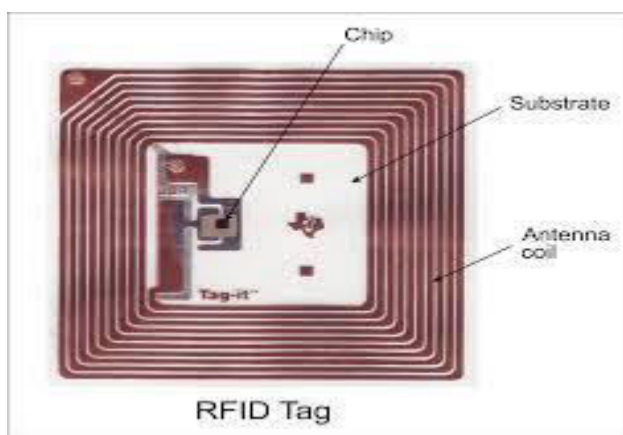
### III. SYSTEM DESCRIPTION

#### a. Microcontroller :

In this system microcontroller Atmega 162 is used. It is based on AVR enhanced RISK architecture and it is a low power CMOS 8-bit microcontroller. When the executing powerful instruction in single clock cycle then the Atmega 162 achieves the outputs about 1 MIPS/MHz. It is power consuming.

#### b. RFID Tags :

RFID tags are categorized into two part one is passive tags and second is active tags. Active tags are costly and it have very wide read range. And these are mostly to use. Passive tags are energized by the power source & improve their range for the reading. It is expensive as compare to the active tag. Tags are basically programmed with new code for user and books.



#### c. RFID READER :

RFID reader manufactured by ThingMagic supporting four antennas, operating at UHF ranges of 865-870MHz, 902-928MHz and 950- 956MHz.

The reader supports the transfer of data to a remote computer over a network connection. Reader is used for the entering and exit of the library. This reader are read only 15 tags at a time. They can read also code even books into the bags

Third component of RFID system is RFID reader. The reader sometimes called an interrogator

It consists of three main parts: control section, high frequency interface and antenna.



#### d. RFID Antenna

RFID antennas are used to collect information about any item. There are many types of RFID antenna like patch antennas, linear polarized antennas, stick antennas and adaptive antennas, gate antenna and Omni directional antennas. According to the researchers, an RFID antenna should satisfy following requirement : (i) Its size should be small, (ii) should have omnidirectional or hemispherical coverage, (iii) must provide maximum possible signal to the microchip, (iv) be robust and (v) be very cheap.

Antenna designer firstly make a known antenna and then change its physical parameters to obtain optimum bandwidth. RFID tags are affixed to items in order to track them using an RFID reader and antenna. RFID tags transmit data about an item through radio waves to the antenna, when the tag receives the transmission from the reader/antenna.

#### e. GSM Module:

GSM is a mobile communication modem, it stands for global system for mobile communication. It is widely used mobile communication system in the word. GSM is an open and digital cellular technology used for transmitting mobile voice and data services operates at the 850MHz,900MHz,1800MHz,1900MHz frequency bands. GSM system was developed as a digital system using time division multiple access(TDMA) technique for communication purpose. A GSM digitizes and reduces the data, then sends it down through a channel with two different streams of client data, each in its own particular time slot. The digital system has an ability to carry 64kbps to 120 Mbps of data rates. modem requires a SIM card to be operated and operates over a network range subscribed by the network operator. It can be connected to a computer through serial, USB or Bluetooth connection.

#### IV. WORKING

This system is proposed on the RFID technology where RFID tags are joined into the books, & user card and RFID reader are used to read RFID tags properly, and theft controlled operation for library system. GSM system is also used in this system. GSM technology is used to alert the user's book taken, due date for return and if not return on a time then the fine to be paid.

The RFID tags are attached into every books and also placed onto the user's ID card. Programming of these tags and they consist a unique codes. Every unique code have a 16 digit code and it is programmed such that the seven digits and the next nine are vary from person to person. Similarly the same type of books have a same code for first seven digit and also have unique ID for the next nine digits. Seven digits is possible to find the same category of books and identify the batch of the student.

Reader is mounted in the entry or exit doors. When the tags are pass through the doors then they are read and communicate to the PC of the library which are connected through the RS-232 cable after that the computation process of microcontroller Atmega 162. When the people enter in to the library then the identity of the individual person is display in the LCD display and when the people leaves the library after the issue books then the SMS alert is given to the user about the book and date is also mentioned in the sms. Similarly send the SMS during return the book. If any person forget the date of return book so daily reminder are given along with the fine amount. Keypad is used to view the history of the issue and return by the user at a time. Keypad has a different-different key for the issue, return and check the stock if it is passive tags. And the active tags are only used to check the history of each users.

#### V.CONCLUSION

RFID in the library speeds up book borrowing, monitoring, books searching processes and thus frees staff to do more user-service tasks. But the performance varies with respect to the vendors of RFID readers and tags. The efficient utilization of the technology also depends upon the information to be written in tag. Developments in RFID technology continue to yield larger memory capacities, wider reading ranges, and faster processing. It is quite clear from the above discussion that an RFID system may be a comprehensive system that addresses both the security and materials tracking needs of a library. The technology saves money too and quickly gives a return on investment. While library RFID systems have a great deal in common with one another, including the use of high frequency (13.56 MHz), passive, read-write tags, lack of a standard and compatibility of tags produced by different vendors is a major problem in implementation of RFID in libraries.

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