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RFID BASED LIBRARY MANAGEMENT SYSTEM

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ABSTRACT

Radio Frequency Identification (RFID) is a new generation of auto identification and data collection technology which allows identification of large number of tagged objects using radio waves. In manual book keeping the whole process of issue, reissues, and return of books is managed by the individual employee. Hence it makes the system dependent on the individual. Library Management System based on RFID allow fast transaction flow and will make easy to handle the issue and return of books from the library. At the end of every month a report is generated about all the transactions done in the library. It also calculates the corresponding fine associated with the time period of the absence of the book from the library database.

Keywords: RFID-Radio Frequency Identification, Arduino-IDE.

I.   INTRODUCTION

Most libraries that store physical media like books, periodicals, film, and other objects adhere to some derivative of the Dewey Decimal System as their method for tagging, storing, and retrieving materials based on unique identifiers. The use of such systems has caused librarians to develop and leverage common constructs that act as tools for both library professionals and library users alike. These constructs include master catalogues, domain catalogues, indexes, unique identifiers, unique identifier tokens, and artifacts. Manual systems put pressure on people to be correct in all details of their work at all times, the problem being that people aren't perfect, however much each of us wishes we were. With manual systems the level of service is dependent on individuals and this puts a requirement on management to run training continuously for staff to keep them motivated and to ensure they are following the correct procedures. It can be all to easy to accidentally switch details and end up with inconsistency in data entry or in hand written orders. This has the effect of not only causing problems with customer service but also making information unable to use for reporting or finding trends with data discovery. Reporting and checking that data is robust can be timely and expensive. This is often an area where significant money can be saved by automation.

II.   EXISTING METHODS

Till date various methods and procedures are used for library management system. Each system has its own unique way to manage the library. Some of these are as followed:

A. INDEGINEOUS METHOD

Some working excel sheets are made and are combined them in a work book.

The whole management can be sub-divided into the following tasks:
- Receiving subscriptions from members.
- Data recording of members.
- Purchase of books.
- Subscription of newspapers and magazines.
- Assigning shelves to books.
- Issuing and managing the books.
- Archiving.
- Inventory management/valuation.

Demerits of this technology are as follows:

- Cannot support huge data,
- Is not a full proof solution to the library management,
- Flexibility only to a limited extend,
- Can be used only for the experimental and evaluation purposes,
- Limited to the knowledge of the user/developer.

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B. BARCODE TECHNOLOGY

Every book in the library is provided with a barcode. The uniqueness of the barcode varies with the thickness of the lines. This type of library management requires manual control. All the major functions of the library such as issuing, reissuing and returning of books needs to be monitored and controlled manually. The barcode readers have the capability to read only one code at a time and therefore at most occasions it leads to a long queue at the issue and return counters. The barcodes need to be programmed at the time of manufacture and these codes can be programmed only once. Once defined the properties of the codes cannot be altered. The codes are printed on a piece of paper and pasted on the books.

During both issue and return of the books the bar-code reader should have direct line of contact with the bar code. For making this possible it is compulsory to make the operation manual. Even under manual operation it is very tedious and time consuming process since each time the reader needs to be placed very near to the barcode tag for the book to be read properly. The bar-code readers have a very small read range of about very few centimetres to make the job tiresome.

Demerits of this technology are as follows:

- Barcode readers require a direct line of sight, using laser technology,
- Scan and read one tag at a time and also time consuming,
- Human intervention is required to scan a barcode,
- It should be visible on the product for scanning
- Does not have read/write memory

III. PROPOSED SYSTEM

The proposed system is based on the RFID technology where RFID tags are embedded on the books and on the user cards and RFID readers are used to read these tags for proper, efficient operation of libraries[1]. Most of the drawbacks associated with the bar-code technology can be overcome using the proposed system.[1]
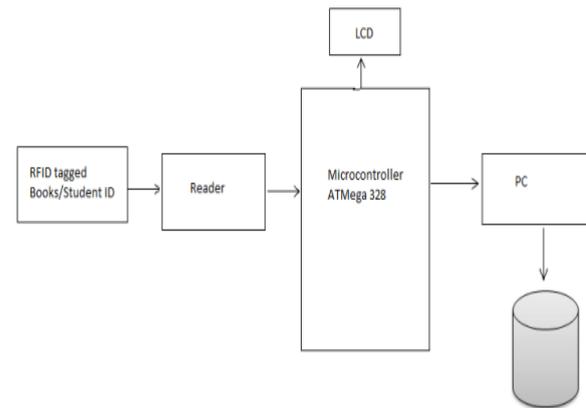
BLOCK DIAGRAM:

Fig 1.Block Diagram for RFID based library management system

The RFID tags (Mifare 1K) are placed on every book and on the ID cards of the users. Tags consist of a unique code. The RFID reader reads the tags on student id card and displays the information about the transactions made by the student .it will show the detail of whether the student need to return the book or pay the fine. When the student returns the book or pay the fine, reader interacts with the microcontroller Atmega328 and update the data in the database about the transaction made. If the student needs to issue any book, the reader will read the tag in the books and update the database with the book being issued by the respective student. The student's ID after scanning his/her card is displayed on the LCD. Email is sent to the user regarding the book issued and the date of return. If failed to return within the due date, remainders are given along with the fine amount to be paid to the library.

IV. ADVANTAGES

- Reduction in manual work.
- Time intensive.
- Quick searching of books.
- Fast transaction rate.
- Update message is generated.
- Fine calculation.

V. CONCLUSION

The costs of maintenance and time consumption of these libraries are reduced. RFID technology is believed to take off in libraries at an increasingly rapid pace. The RFID tag contents will increase in power,

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prices are expected to decline and tag will dramatically improve its efficiency, security and accuracy.

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