A STUDY ON SMART RFID BASED BOOK TRACKING SYSTEM

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Abstract- **RFID based systems are going to revolutionize the entire library automation systems. In this system we are going to develop library automation system, which will track the books, whether they are in library, so that library user will get the instant information. RFID can be used library circulation operations and theft detection systems. RFID-based systems move beyond security to become tracking systems that combine security with more efficient tracking of materials throughout the library, including easier and faster charge and discharge, inventorying, and materials handling.**

Keywords: RFID Tag , RFID reader, Bluetooth etc.

1.INTRODUCTION

RFID (Radio Frequency Identification) allows an item, for example a library book, to be tracked and communicated with by radio waves. This technology is similar in concept to a cell phone[1]. RFID is a broad term for technologies that use radio waves to automatically identify people or objects. There are several methods of identification, but the most common is to store a serial number that identifies a person or object, and perhaps other information, on a microchip that is attached to an antenna (the chip and the antenna together are called an RFID transponder or an RFID tag). The antenna enables the chip to transmit the identification information to a reader. The reader converts the radio waves reflected back from the RFID tag into digital information that can then be passed on to computers that can make use of it .The heart of the system is the RFID tag, which can be fixed inside a book's back cover or directly onto CDs and videos. This tag is equipped with a programmable chip and an antenna. Each paper-thin tag contains an engraved antenna and a microchip with a capacity of at least 64 bits. The entire system adopted the Arduino UNO microcontroller board (Based on ATMEGA 328).

2. EXSTING SYSTEM

Android based application to navigate the position of the user in library. In this system GPS is used to show the path to the book[2]. This concept named Living Library gives interaction with Virtual world and Physical World using camera in mobile. It's useful to all the android[3].The main disadvantages are: The GPS should be of high accuracy. The technique is applicable to small libraries with less number of books[4].

2.1 Components of an RFID System:
A comprehensive RFID system has four components:
  - ➢ RFID tags that are electronically programmed with unique information
  - ➢ Readers or sensors to query the tags

- Antenna
- Server on which the software that interfaces with the integrated library software is loaded.
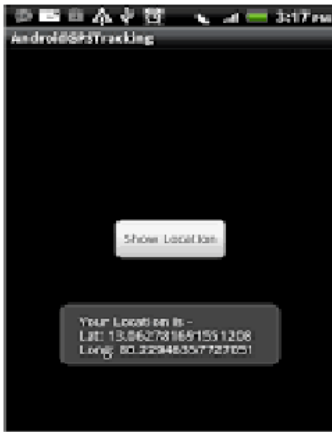- Tags.

Fig: 1.1 android tracking application.

2. RFID SYSTEM

The RFID reader will scan each book on the shelf. The data acquired will be sent to the host Mobile to process the data[5]. There will be a LCD output mechanism to alert the Student if there is a misplace book. Database and RFID chip will be used as storage[6].
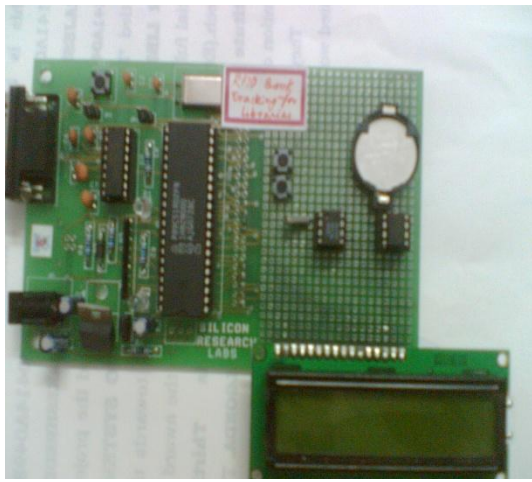

Fig: 2 Proposed System partial structure

2.1 RFID Reader

RFID Reader Module, are also called as interrogators. They convert radio waves returned from the RFID tag into a form that can be passed on to Controllers, which can make use of it. RFID tags and readers have to be tuned to the same frequency in order to communicate. RFID systems use many different frequencies, but the most common and widely used & supported by our Reader is 125 KHz. RFID readers or receivers are composed of a radio frequency module, a control unit and an antenna to interrogate electronic tags via radio frequency (RF) communication[7].

3.TYPES OF RFID TAGS

RFID tags come in three general varieties: *passive*, *active*, or *semi-passive* (also known as *battery-assisted*). Passive tags require no internal power source, thus being pure passive devices (they are only active when a reader is nearby to power them), whereas semi-passive and active tags require a power source, usually a small battery[8].


Fig: 3.1 RFID Tag

3.1 Microcontroller description:

Microcontroller interfaced with an RFID module by an RS232, microcontroller is not directly connected to rs232 because RS-232 signal levels are far too high TTL electronics, and the negative RS-232 voltage for high can't be handled at all by computer logic. To receive serial data from an RS-232 interface the voltage has to be reduced. Also the low and high voltage level has to be inverted[9].

This level converter uses a Max232 and five capacitors. The max232 is quite cheap (less than 5 dollars) or if you are lucky you can get a free sample

from **.**The MAX232 from Maxim was the first IC which in one package contains the necessary drivers and receivers to adapt the RS-232 signal voltage levels to TTL logic[10]. It became popular, because it just needs one voltage (+5V or +3.3V) and generates the necessary RS-232 voltage levels.

3.2 Model Layout
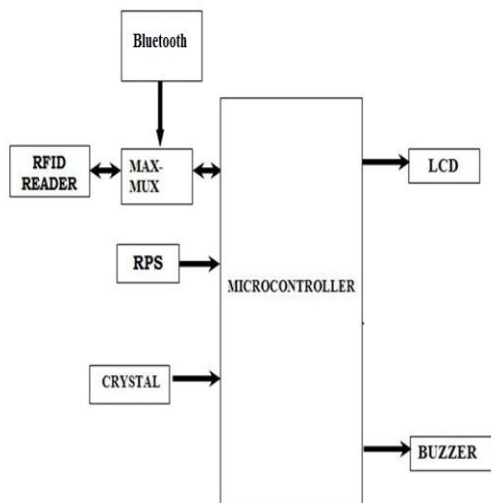
3.2.1 Model layout of RFID system

RFID is the need to increase efficiency and reduce cost. RFID has the added advantage that it can also provide security for the range of different media offered in libraries. Library staffs can relieve their professional employees of routine work and operational tasks. Reduces the amount of staff time required to ready materials for re-shelving.

4 . CONCLUSION

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. RFID in the library is not a threat if best practices guidelines followed religiously, that it speeds up book borrowing and inventories and frees staff to do more user-service tasks. The technology saves money too and quickly gives a return on investment. It is important to educate library staff and library users about RFID technology before implementing a program. It may be good for librarians to watch developments in RFID until the cost of tags comes down to $.20 or less.

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