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Smart Library Using NFC

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***ABSTRACT*- Automation is automatic control. It is a technique, method or system of operating or controlling a process by highly automatic means, as by electronic devices reducing human intervention to a minimum.**

Library automation is vital resource between students and teachers. Here we are going to implement the library automation without Robotics. We are using simple method for automation using NFC system and RFID system. That is the person having NFC band can only able to enter in the library .So it is fully secured system. Until now Library automation was done with the help of Robotics like build library. Now we are developing the automation with simply RF system and NFC. So as compare to Robotics automation the cost of the project is less.

INTRODUCTION

The basic idea of our project is based upon the lines of the **"SMART LIBRARY USING NFC"** used in the libraries.

Library is a vital learning resource in an institution of higher education both for teachers and students.

In current library system students who taken books from library, don't return books on time and moreover man power is required to manage the system to overcome this problem we implement smart library automation system. Automation of libraries will give them altogether a new life.

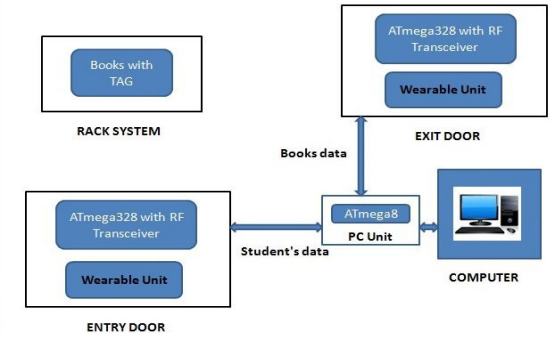
Organization of Paper:

Taking into consideration the literature survey we will discuss the general block diagram, the 4 main section of project is NFC(Near Field Communication) band. Then conclusions or applications derived from the approaches we used and future scope of enhancement. At the end references used for preparing this paper are shown.

Literature Review: NFC standards cover communications protocols and data exchange formats, and are based on existing radio-frequency identification (RFID) standards including ISO/IEC 14443 and FeliCa. The standards include ISO/IEC 18092 and those defined by the NFC Forum, which was founded in 2004 by Nokia, Philips Semiconductors (became NXP Semiconductors since 2006) and Sony, and now has more than 160 members. The Forum also promotes NFC and certifies device compliance and if it fits the criteria for being considered a personal area network.

NFC builds upon RFID systems by allowing two-way communication between endpoints, where earlier systems such as contactless smart cards were one-way only. It has been used in devices such as Google Nexus, running Android 4.0 Ice Cream Sandwich, named with a feature called "Android Beam" which was first introduced in Google Nexus.

Block Diagram:



bBlock Diagram Description:

At the entry system we are using the wearable unit for the entry. The wearable unit is like a band. So the NFC reader will read the NFC tag and door will be open. Now the person will move towards t h e shelf for the book and while taking book from the rack, we are having books with tag so that band (wearable unit) can read the tag by NFC reader. At the exit, the reader will read the NFC (wearable unit which having stored data) that person having with him. And will send the data to the PC then exit door will open

NFC: This device is used to read ID number from the NFC Tag of student and send the id to microcontroller for further process. The NFC reader module reads the data from the NFC tag and sends the information to the microcontroller. The Data of the student is present in the NFC tags. The data in the NFC tag cannot be rewritten by the student. Once the data entered in the tag the information cannot be altered. The PN533 is a highly integrated transceiver module for contactless communication at 13.56 MHz based on the 80C51 microcontroller core. A dedicated ROM code is implemented to handle different RF protocols.

RF Tag: In an RFID system the transponder that contains the data to be transmitted is called an RF tag. RF tags are either active or passive. Radio frequency identification technology used to transfer data. A radio-frequency identification system uses tags, or labels attached to the objects to be identified. Two-way radio transmitter-receivers called interrogators or readers send a signal to the tag and read its response.

Features:

1. **F transceiver CC2500:**

- ow power consumption.
- .4GHz frequency
- PI interference
- 0m range
- igh sensitivity
- peration voltage: 1.8~3.6 Volts.

2.ATmega8

- 1
  30 Powerful Instructions
- Most Single-clock Cycle Execution
- 32 x 8 General Purpose Working Registers
- F
  ully Static Operation
- U
  p to 16 MIPS Throughput at 16 MHz
- O
  n-chip 2-cycle Multiplier

Circuit Diagram:

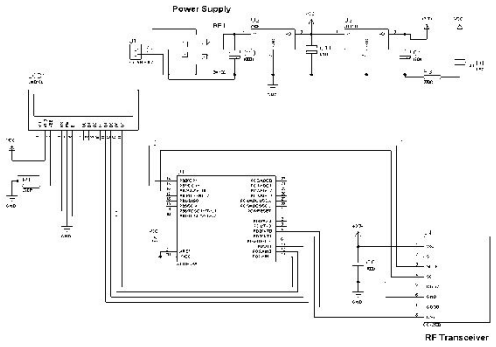


Fig. Door unit

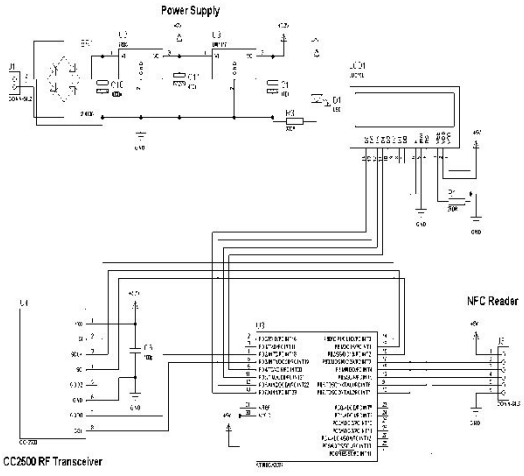


Fig. Wearable unit

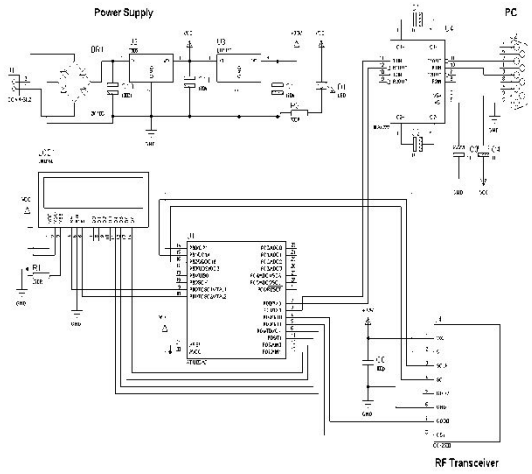


Fig. PC unit

Current Consideration:

Firstly we were using RFID system for library automation but due to distance problem and range we are using NFC system.The range of NFC system used for smart libaray is about 30m.

Conclusion:

Our project "SMART LIBRARY USING NFC" provides improved and efficient system. Making it wireless makes it more reliable.This proposed method can provide a safe, secure and efficient way of Smart Library system. By using this technique NFC based automated library; it solves the problem of manual process. This new technology gives solution and this research work will make a great change in library system. At the most, we can ensure that the project is totally reliable. It making the library system reliable. The data of each book and student will be saved and there is no chance of losing books from library .so it is fully secured and easy method and easy to understand to user also.

Future enhancement:

- This system can be applicable in mall.
- GSM module can be use for better security.
- We can use password break system or RFID tag system in place of NFC system.
- Metro gate can be use in entry and exit system.
- In the place of NFC reader we can use HF reader but it is costly.

Acknowledgement:

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Reference:

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