

RFID based ID Detection for Library System

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Abstract: *There has been rising demand for secure system. This paper describes the RFID based ID detection for Library system. In the long-ago the barcode's are more preferable as compared to RFID because of their cost but now a day's RFID are easily available and are more convenient to use. Here we use the Lpc2138 for interfacing and decoding. These makes the circuit and programming a lot easier to understand. We exhibit the outline and usage of a framework get to control utilizing radio frequency identification proof (RFID) controlled by Lpc2138 stage. The proposed framework consists the RFID reader, RFID tag (distinguishing proof cards), microcontroller Arm7 LPC2138, and graphical UI (GUI) executed in Matlab®. Through a GUI, it is conceivable to take control of access to the building. If tag is matched to stored database then it access, otherwise it denied. Utilizing distinguishing proof cards, the Students can get to data of approved individual.*

Keywords: *Data, RFID Reader, RFID Tag, LPC 2148*

I. INTRODUCTION

RFID was invented in 1969 and is now used in many applications. When used in sectors or retail stores generally have the cost of the good. Even in a grocery store the once-left goods are less likely to return. This is not the case when it is used in a library, since the books are issued and given a certain period of time in which the book must be returned. The same book can be taken over and over again as needed by users. Users also have unique identification codes. Users can use the library more than once. So the reader will have to read the same label more than once.

RFID is an automatic identification technique used for the rapid operation of books, magazines or DVDs using RFID tags and readers. RFID technology helps to provide, back and quickly re-edit books. The technology helps direct transaction tags for the PC librarian and automatic updating of transactions in the user account. RFID tags can be programmed as a unique code. This

code is read through the RFID reader. When a tag passes the reader, the reader recognizes the unique code and updates the user's account.

Modern readers have the ability to read up to 15 tags at one time. The frequency range up to 13.5 Hz and has a wide reading range of about 2 meters. RFID tags are embedded in books and are not visible to detection. Readers, as they have a wide range of reading unlike barcode readers, have the ability to read labels even when they are included in books. Particular care and attention is given to the programming labels, because they are mostly programmable only once. These labels You can store the number of stacks, access numbers, number of books, author information, etc., but the bar code technology is limited to the identification number only. Programming the cost of RFID tags is much more expensive than barcodes, but it should be noted that the same label can be reprogrammed if needed. Second label added cost increases added.

II. LITERATURE SURVEY

An intelligent monitoring system called BLOCS book [1] with two localization modes that use RFID technology: the mode of book mode and book list only. Single Book Mode provides users with the shelf containing the desired product that has been lost book. Book List mode provides a matching list of bookshelves and books regularly missing for a librarian to locate all the lost books on the wrong shelf. The libraries of the management system [2] have been developed using radio frequency identification (RFID). The research was conducted by integrating the RFID system and creating a graphical user interface (GUI) on the host PC. An Internet-based concept is integrated with RFID technology to form a web-based application for library management [3]. This player is a compatible reader capable of reading any tag frequency such as low, high, and ultra-high. Each

user and each has an RFID tag that has dedicated an exclusive EPC (Electronic Product Code) to the database for more details. In this document, the issues and problems faced in the library environment such as locating books or materials out of place, reducing manual labor and easy access to books is done and developed a solution that could overcome these problems the best job.

Some RFID systems consist of tags, RFID readers, computer terminals, optical networks, servers and controllers. And the RFID minimum system includes RFID labels, microcontroller or gate array (FPGA) readers and fields, or application-specific integrated circuit (ASIC) [4]. Depending on the power source, RFID tags are classified as active or passive. Active tags use a battery to power the circuit in the label and transmit information reader information application. A library is a collection of information, sources, resources, books and services, and the structure in which it is hosted. many libraries are now also storage and access points for maps, prints, or other documents in various storage media such as microfilms, audio tapes, CDs, LPs, cassettes, tapes and DVDs.

Libraries have the materials which are arranged in a certain order based on a library classification system so that items can be positioned quickly and collections can be scanned efficiently. Reference cells are different, which has only reference books and selected members only. [5] RFID technology can revolutionize people's lives through their various applications. This technology is used in library library monitoring or libraries, building access control, pallet tracking, airline baggage tracking, and traceability of pharmaceuticals. In addition, RFID is used to automate various processes They range from home and industrial control [6]. Being involved in the production and distribution of plants, animals, food, medicine will bring great benefits such as: production line specifications, product quality control, and the development of an automated inventory when products enter the store warehouse market.

III. METHODOLOGY

RFID is a technology based on sensors consisting of three key elements: RFID

(transponder) tags, RFID (transceiver) readers and a data collection, distribution and data center (middleware) that has the ability to identify or information More speed and precision scan [12]. RFID technology is involved in several modules in libraries. Such as tagging the tag RFID label station to each library of materials; Self-check-out station models to borrow self-service books; Drop Book Station is used to return books; And anti-theft security doors ensure that items are removed before leaving the library by detecting whether the RFID tag attached to the voice is activated; And finally, in terms of self-management, for example, customers can track search items that have been bypassed with the use of a portable RFID reader. The main library adopts the goal of RFID technology to improve self-service. Customers can borrow and return items with auto loan machines, which require a library card and a PIN. The car becomes much easier with this new technology because it does not require the line of sight and max. The purpose of this work is to implement the new generation of Library Management System.

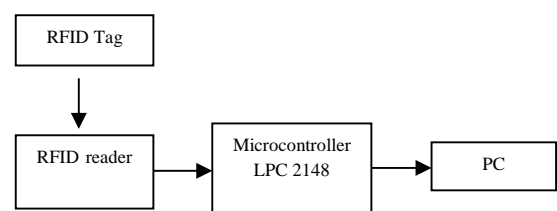


Fig 1: Block Diagram of Proposed System

1) Microcontroller

The LPC2138 microcontrollers are based on a 32/16 bit ARM7TDMI-S CPU with real-time emulation and embedded trace support, that combines the microcontroller with 32 kB, 64 kB, 128 kB, 256 kB and 512 kB of embedded high speed Flash memory.

A 128-bit wide memory interface and a unique accelerator architecture enable 32-bit code execution at maximum clock rate. For critical code size applications, the alternative 16-bit Thumb mode reduces code by more than 30% with minimal performance penalty. Due to their tiny size and low power consumption, these microcontrollers are ideal for applications where miniaturization is a key requirement, such as access control and point-of-sale. With a wide range of serial communications interfaces and on-chip SRAM options of 8/16/32

kB, they are very well suited for communication gateways and protocol converters, soft modems, voice recognition and low end imaging, providing both large buffer size and high processing power. Various 32-bit timers, single or dual 10-bit 8 channel ADC(s), 10-bit DAC, PWM channels and 47 GPIO lines with up to nine edge or level sensitive external interrupt pins make these microcontrollers particularly suitable for industrial control and medical systems.

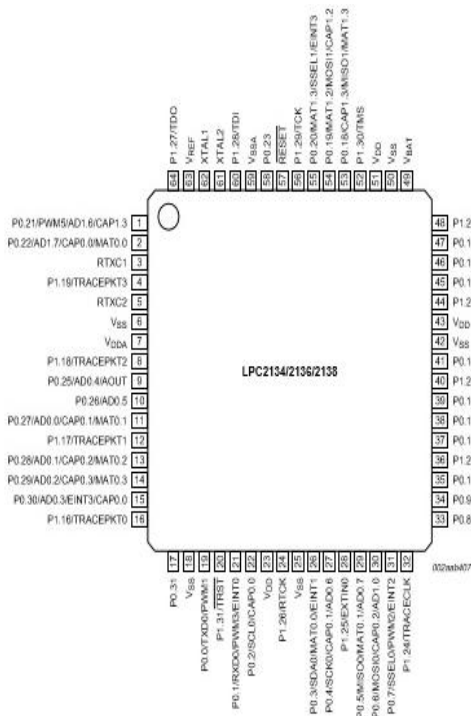


Fig 2: Pin diagram of Microcontroller LPC 2138

The small size of ARM7 die makes it ideal for integration into a large custom chip that could also include RAM, ROM, logic, DSP and other cells [10].

2) RFID Reader

Readers are available in many shapes, operate at different frequencies, and offer a wide range of features. The RFID reader shown in Fig.2 below. Readers can have their own processing power and internal memory, and can provide network connectivity. Two types of readers are used in this system. One is a fixed reader and another hand. RFID readers are mounted on the doors and the library.



Fig 3: RFID Reader

These readers can read up to 15 tags at the same time, even if there is a green contact between the reader and the code. You can also read the tags too if the books are stored in bags.

3) RFID Tags

An RFID tag shown in Fig.3(right) The antenna is clearly visible. The antenna has the greatest impact on the size of the label. The microchip is visible at the center of the label, and since this is a passive tag that does not have internal power [3].



Fig 4: RFID Tag

RFID labels are attached to student books and identity cards. RFID labels are generally of two types: active tags and passive tags. Active tags have a very wide reading range and are therefore expensive. These are very efficient for use. Passive tags must be powered by a power supply to improve the reading range through the player. Passive tags are inexpensive compared to active tags. Tags are usually programmed with unique user codes and books.

To do the task of detecting and reading RFID tags, in this case is not necessary for writing the card, it is IDE microcontroller development in the ID reading of each tag, then printing RFID codes through a USB port terminal (Virtual COM4). MATLAB can be used for a wide range of applications such as signal and image processing, control drawing, testing, math modeling, family analysis, GUI creation among others. This is a programming environment, it is a tool to solve technical calculation problems because it is extremely powerful. To program the microcontroller on a board, the programming language and the development environment are used. These applications can be downloaded free of charge from its website, as well as the hardware reference drawings that are available in open source license

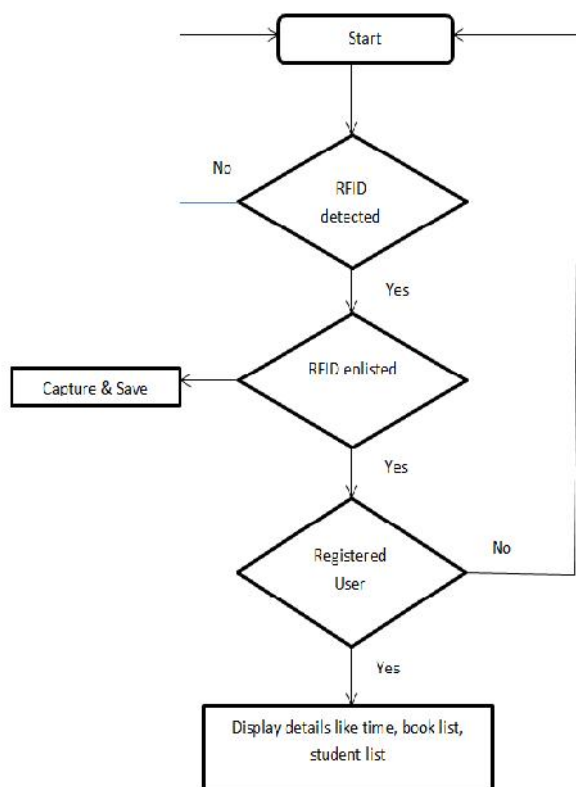


Fig 5: Flowchart of system

The fig.4 (above right) shows the flowchart of the proposed system. When the RFID card is swap by any student or staff then it detect the RFID card. If card is Valid then user is register, his/her data is display on the Personal Computer of library system.

The display the exact time, booklist, studentlist, also it display either he/she is Staff or Student.

IV. RESULT

In order to check the results of our system in Fig. 6, show the GUI implemented in Matlab® in this part it's possible to add and edit the information of the Student. Fig.7, shows the result when the identification card doesn't exist in the database or when Student are not authorized to access. Fig.8. Shows the personal information of the Student assigned to the ID number of the tag contained in the database, as well as a display of the day and time, allowed access.

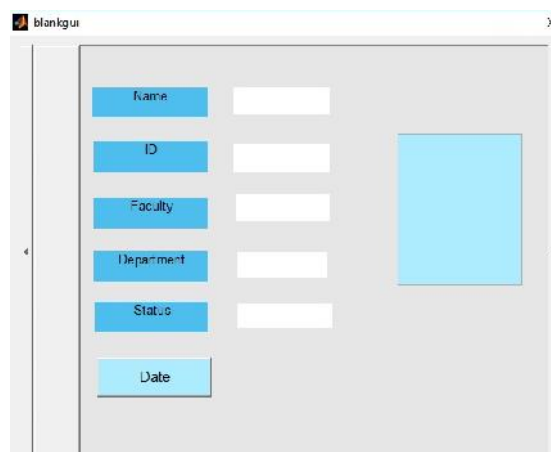


Fig.6. Data editing in the GUI

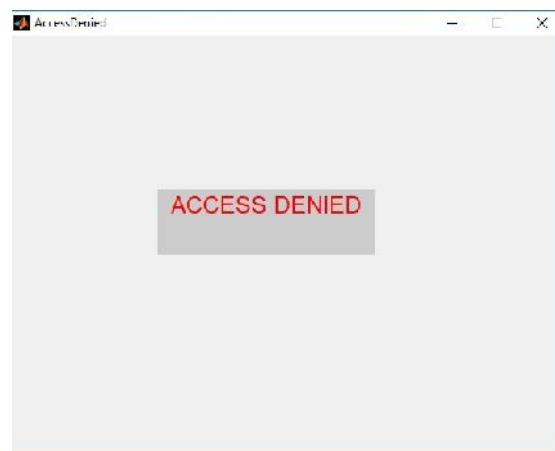


Fig.7, The information not found in the database

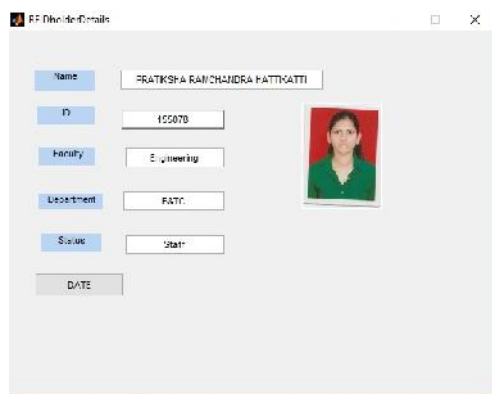


Fig. 8 . GUI with the correct information.

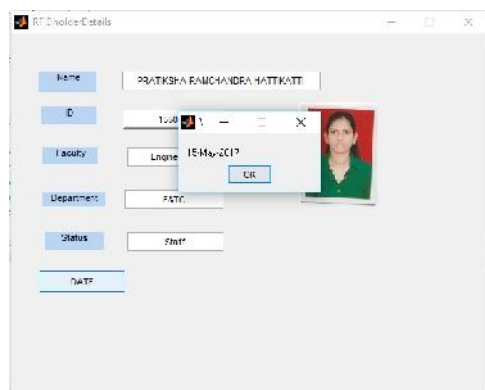


Fig. 9. GUI with date and time.

V. CONCLUSIONS

We present a ID detection for Library system by RFID which was achieved with success since this manages to give or deny access to the personal student, which is reliable, low cost and is easy to operate. RFID efficiently manages libraries, provides the ease of use and convenience to the users as well as librarians.

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