IoT BASED LIBRARY MANAGEMENT SYSTEM

Jamuna T.1
Assistant Professor , Dept. of E.C.E,
[1]SNS College of Engineering,
Coimbatore, India.
jamunaname19@gmail.com

Banumathi.R S.2
B.E., Dept. of E.C.E,
[2]SNS College Of Engineering,
Coimbatore, India.
banumathirsbp@gmail.com

Kasthuri.M S.3
B.E., Dept. of E.C.E,
[3]SNS College Of Engineering,
Coimbatore,India.
kasthuri.murugan.1996@gmail.com

Kaviya priyadharshini S.4
B.E., Dept. of E.C.E,
[4]SNS College Of Engineering,
Coimbatore, India.
kaviyamohanram@gmail.com

Mimija loamshee fredy S.5
B.E.,Dept. of ECE.,
[5]SNS College Of Engineering,
Coimbatore,India.
mimicute484mj@gmail.com

Abstract-RFID authentication plays a significant role in protecting the security and privacy in radio frequency identification (RFID) system the location information is very important in many applications such as Internet of Things (IoT), logistics, library management and so on.We proposed a low cost IOT based library management system ,we designed to reduce manpower(librarian) and time of book entry per student by using RFID tagged book and student ID(college identity card) and to send notification through cloud computing application.
Key words-CloudComputing;RFID;IoT;Proteus.

I.INTRODUCTION

Recently, radio frequency identification (RFID) has been widely used because of its high performance and low cost and along with Mobile cloud computing (MCC), the integration of cloud computing and mobile services,significantly enhances the data transmission efficiency and the processing capacity in mobile networks, and greatly improves the equality of service (QoS) of the voice- or video- streaming over mobile.

RFID is fixed on the books and on the student id card. MCC technology helps to store information and send message to the respective student with details of book and due date for fast issuing, returning, and reissuing of books.

The Proposed System consists of a radio frequency identification (RFID),PIC16F877A,power supply,electronic stability program,LCD and Mobile Cloud Computing (MCC). RFID has been widely used because of its high performance and low cost and along with Mobile cloud computing (MCC), the integration of cloud computing and mobile services,significantly enhances the data transmission efficiency and the processing capacity in mobile networks, and greatly improves the equality of service (QoS) of the voice- or video- streaming over mobile. The details about the particular book will be displayed on the mobile phone as message with the details of student name, register number, book name, author name, current date,and renewal date.

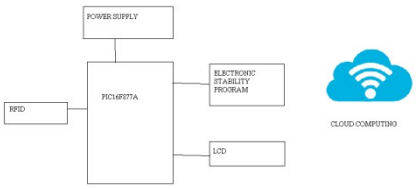
II. EXISTING SYSTEM

For radio frequency identification (RFID) system,the location information is very important in many applications such as Internet of Things (IoT), logistics, library managementand so on. Most of traditional RFID localization algorithms canonly locate one tag at a time. However, multi-tag localization is desired in many RFID applications. In this paper, we propose a novel range-free algorithm named NMDS-RFID(F) which combines the nonmetric multidimensional scaling (NMDS) algorithm and the fingerprinting localization algorithm to achieve indoor RFID multi-tag cooperative localization. The NMDS-RFID(F)algorithm firstly uses received signal strength (RSS) Euclidean distance based on fingerprinting method to get the rank order of the distance for all pairs of tags, and then NMDS algorithm isused to generate the relative coordinates of tags. Finally, due to the coordinates of reference tags are known, we can use the coordinate system registration algorithm to get the absolute coordinates of tags.

III. PROPOSED METHOD

RFID is fixed on the books and on the student id card. The RFID technology helps in fast issuing, returning, and reissuing of books. TheMCC technology helps to store information and send message to the respective student with details of book and due date.The students details and book details will be updated to the librarian's mobile phone through the mobile cloud computing. The details about the particular book will be displayed on the mobile phone.The software application in the mobile phone provides the alert message to the students with the student name, register number, book name, author name, current date,and renewal date.

Block diagram



The above figure is the diagrammatic representation of the proposed system

IV. HARDWARE IMPLEMENTATION

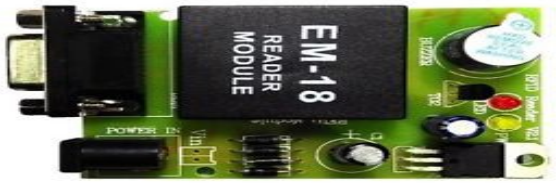
A.PICMICROCONTROLLER (PIC16F877A)

A.PIC (usually pronounced as *"pick"*) is a family of microcontrollers made by Microchip Technology, derived from the PIC1650 originally developed by General Instrument's Microelectronics Division. The name PIC initially referred to *Peripheral Interface Controller*. The first parts of the family were available in 1976; by 2013 the company had shipped more than twelve billion individual parts, used in a wide variety of embedded systems.Early models of PIC had read-only memory (ROM) or field-programmable EPROM for program storage, some with provision for erasing memory. All current models use flash memory for program storage, and newer models allow the PIC to reprogram itself. Program memory and data memory are separated. Data memory is 8-bit, 16-bit, and, in latest models, 32-bit wide. Program instructions vary in bit-count by family of PIC, and may be 12, 14, 16, or 24 bits long. The instruction set also varies by model, with more powerful chips adding instructions for digital signal processing functions.The hardware capabilities of PIC devices range from 6-pin SMD, 8-pin DIP chips up to 144-pin SMD chips, with discrete I/O pins, ADC and DAC modules, and communications ports such as UART, I2C, CAN, and even USB. Low-power and high-speed variations exist for many types.The manufacturer supplies computer software for development known as MPLAB X, assemblers and C/C++ compilers, and programmer/debugger hardware under the MPLAB and PICKit series. Third party and some open-source tools are also available. PIC devices are popular due to their low cost, wide availability, large user base, extensive collection of application notes, availability of low cost or free development tools, serial programming, and re-programmable Flash-memory capability.

B.RFID READER

Radio-frequency identification (RFID) uses electromagnetic fields to automatically identify and track tags attached to objects.

The tags contain electronically stored information. Passive tags collect energy from a nearby RFID reader's interrogating radio waves. Active tags have a local power source (such as a battery) and may operate hundreds of meters from the RFID reader. Unlike a barcode, the tag need not be within the line of sight of the reader, so it may be embedded in the tracked object. RFID is one method for Automatic Identification and Data Capture (AIDC



C.RFID TAG

Radio-frequency identification (RFID) uses electromagnetic fields to automatically identify and track tags attached to objects. The tags contain electronically stored information. Passive tags collect energy from a nearby RFID reader's interrogating radio waves. Active tags have a local power source (such as a battery) and may operate hundreds of meters from the RFID reader. Unlike a barcode, the tag need not be within the line of sight of the reader, so it may be embedded in the tracked object. RFID is one method for Automatic Identification and Data Capture (AIDC).

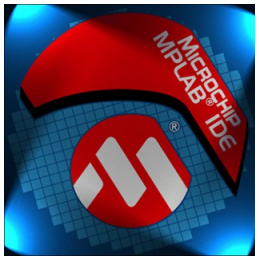
D.LCD

A liquid-crystal display (LCD) is a flat-panel display or other electronically modulated optical device that uses the light-modulating properties of liquid crystals. Liquid crystals do not emit light directly, instead using a backlight or reflector to produce images in colour or monochrome.LCDs are available to display arbitrary images (as in a general-purpose computer display) or fixed images with low information content, which can be displayed or hidden, such as preset words, digits, and 7-segment displays, as in a digital clock. They use the same basic technology, except that arbitrary images are made up of a large number of small pixels, while other displays have larger elements.

V.SOFTWARE IMPLEMENTATION

A.MP LAB IDE

Microchip has a large suite of software and hardware development tools integrated within one software package called MPLAB Integrated Development Environment (IDE). MPLAB IDE is a free, integrated toolset for the development of embedded applications on Microchip's PIC and dsPIC microcontrollers. It is called an Integrated Development Environment, or IDE, because it provides a single integrated environment to develop code for embedded microcontrollers.MPLAB IDE runs as a 32-bit application on MS Windows, is easy to use and includes a host of free software components for fast application development and super-charged debugging. MPLAB IDE also serves as a single, unified graphical user interface for additional Microchip and third party software and hardware development tools. Moving between tools is a snap, and upgrading from the free software simulator to hardware debug and programming tools is done in a flash because MPLAB IDE has the same user interface for all tool.

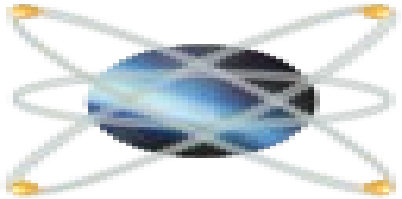


B.ANDROID STUDIO

Android Studio is the official integrated development environment (IDE) for Google's Android operating system, built on JetBrains' IntelliJ IDEA software and designed specifically for Android development.It is available for download on Windows, macOS and Linux based operating systems. It is a replacement for the Eclipse Android Development Tools (ADT) as primary IDE for native Android application development.Android Studio was announced on May 16, 2013 at the Google I/O conference. It was in early access preview stage starting from version 0.1 in May 2013, then entered beta stage starting from version 0.8 which was released in June 2014.The first stable build was released in December 2014, starting from version 1.0.

C.PROTEUS DESIGN SUITE

The Proteus Design Suite is a proprietary software tool suite used primarily for electronic design automation. The software is used mainly by electronic design engineers and technicians to create schematics and electronic prints for manufacturing printed circuit boards.It was developed in Yorkshire, England by Labcenter Electronics Ltd and is available in English, French, Spanish and Chinese languages.The first version of what is now the Proteus Design Suite was called PC-B and was written by the company chairman, John Jameson, for DOS in 1988. Schematic Capture support followed in 1990, with a port to the Windows environment shortly thereafter. Mixed mode SPICE Simulation was first integrated into Proteus in 1996 and microcontroller simulation then arrived in Proteus in 1998. Shape based autorouting was added in 2002 and 2006 saw another major product update with 3D Board Visualisation. More recently, a dedicated IDE for simulation was added in 2011 and MCAD import/export was included in 2015. Feature led product releases are typically biannual, while maintenance based service packs are released as required.

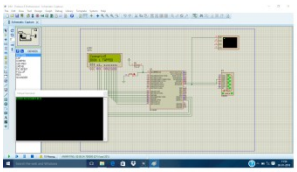


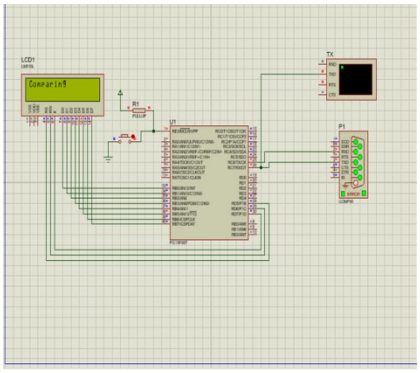
The design system provides a low cost, convenient and easy to use system for surveillance purpose. It is easy to capture the intruders.

It will be easy and much comfortable to any kind of places. This system also ensures good quality of service. Apart from this the captured image can be viewed.

CONCLUSION

In this project we have developed a mobile app as a library manager for library management system by using mobile computation technology(mcc) in IOT system.in here there is no need of manpower(librarian) instead of that we have include cloud computing app.without using any sensors we also reduced cost.data base that is details of the students and book have been stored then transmit and receive easily even at the time of noaccess internet.a simple library management system using app and pic have been developed.





FUTURE ENHANCEMENT

In future, the project used in several applications by adding additional components such as colud App. By using gps, we can directly have a communication with the inducers.

Also by connecting a pic microcontroller instead to getting for more information about the intruders entry. So there is no need for continuous monitoring of human.

REFERENCES

[1] Rajkumar Buyya, Chee Shin Yeo, Srikumar Venugopal, James Broberg,Ivona Brandic, “Cloud computing and emerging IT platforms: Vision, hype and reality for delivering computing as the 5th utility,” Future Generation Computer Systems, Volume 25, Issue 6, June 2009, pp. 599-616.[2]J. U. Duncombe, “Infrared navigation—Part I: An assessment
of feasibility,” *IEEE Trans. Electron Devices*, vol. ED-11, no. 1, pp. 34–39, Jan. 1959.
[3]E. P. Wigner, “Theory of traveling-wave optical laser,”*Phys. Rev.*,
vol. 134, pp. A635–A646, Dec. 1965.
[4] E. H. Miller, “A note on reflector arrays,” *IEEE Trans.Antennas Propagat.*, to be published. [5]P. Zhang, K. Siu, J. Zhang, C. K. Liu, and J. Chai, “Leveraging depth cameras and wearable pressure sensors for full-body kinematics and dynamics capture,” ACM Trans. Graph., vol. 33, no. 6, pp. 221:1–221:14, Nov. 2014.
[6]X. Wei, P. Zhang, and J. Chai, “Accurate realtime full-body motion capture using a single depth camera,” ACM Trans. Graph., vol. 31, no. 6, pp. 188:1–188:12, Nov. 2014.