RFID BASED HOSPITAL MANAGEMENT SYSTEM

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Abstract : **RFID is an acronym which stands for "Radio Frequency Identification" and refers to technology where the data encoded in radio frequency identification tags (RFID tags) is read by radio waves. RFID technology facilitates automatic wireless identification and health status using suitable electronic active and passive tags for readers. The project aims to use and implement radio frequency identification technology in the healthcare sector. The key benefits of implementing RFID in healthcare include patient safety, patient record tracking, patient care efficiency, reduced physician workload and, most importantly, satisfaction with the offer. The project outlines how RFID cards can effectively interfere with a database local server, detailing the patient's medical history.**

***Keywords*- RFID, RFID tags, SQL, Medical history**

I. INTRODUCTION

Healthcare, as an industry, is progressively being put resources into and applied to RFID innovation. One of the principle explanations behind this is that RFID is spreading quickly in the business and there are various individuals in the medical care area who can profit. In emergency clinics furnished with an assortment of advancements, RFID is accessible in numerous structures - from careful instrument following to patient discovery, patient wellbeing data and staff presence. Radiofrequency ID in a medical services association gives proper, quick or constant following and the executives of staff in a wide range of patient consideration conditions. It gives a valuable instrument to acquiring pertinent data when following efficiency in a bustling clinic. Radio Frequency Identification (RFID) is an effective, developing innovation that utilize radio waves to gather and communicate information. History says that radio recurrence recognizable proof innovation has been utilized chiefly in inventory network the executives, medical clinics for warehousing of products. Radio recurrence has been recognized to carry out and work on cost-saving measures and expanding productivity in a scope of organizations. As of late, its presentation, use and advantages in the field of medical care have been found. Radio Frequency Identification can consequently recover or gather information without human mediation. Dissimilar to standardized tag examining, radio frequency ID doesn't require readers to utilize a line of priority to recover data from labels.

A RFID framework for the most part comprises of a tag reader and database. tags can be enabled or disabled. An active tag has its own fuel source, while an inert label utilizes the tag reader as its fuel source. The card reader utilizes RFID signals to recover information from the tag, which incorporates ID esteems, data about the hospital and encoded data in the tag identified with its area. The data collected from the transponder reader or radio frequency identification reader is then sent to the database installed on the server via the local area network (LAN). Clients would then be able to recover information utilizing an application introduced on the server. Here we are utilizing XAMPP web server. XAMPP is a free server cross-stage and an open-source web worker created by Apache Friends. It for the most part deciphers scripts written in Apache HTTP Server, DB Database and PHP and Perl programming languages. Many web servers are fabricated utilizing XAMPP. XAMPP deals with Windows Server 2008 and later, for Mac it just works for Mac OS x10.6 and later.

The XAMPP is an IA-32 i.e., Intel Architecture 32-digit bundle worker for just windows bundles and x64 engineering for MacOS and Linux bundles. XAMPP is a simple hotspot for advancement of webservers. The XAMPP additionally offers a help for making and controlling the information bases in the MariaDB and SQLite among others. When we download or introduce the XAMPP server, it is feasible to treat a localhost like a distant host by interfacing utilizing FTP customers.

PHP is an open-source prearranging language. The PHP is a PHP Hypertext Preprocessor. These PHP scripts are executed on the server. The phpMyAdmin is perhaps the most well-known php applications and furthermore MySQL organization device. The phpMyAdmin is additionally a free and open-source device for MySQL and MariaDB essentially composed a php for versatile web applications. It is perhaps the most mainstream organization apparatuses for MySQL particularly for facilitating the web administration. It comprises of huge local area of clients and patrons. It upholds every one of the working frameworks like windows, Linux and OS2.

II. PROBLEM STATEMENT

Collecting the information of patient is the primary aspect in any hospital. Patient may not keep his/her medical records for longer time and might forget to bring the records every time he/she visits the hospital. Our project can resolve the above problem using RFID technology and cloud storage. By scanning the given RFID tag, doctor or physician can access the previous medical records of the patient and can easily provide a solution for the health issues.

III. OBJECTIVES

- To maintain smooth management system by tracking the information using RFID cards.
- Obtain the patient's health history.
- To store and access data easily through database.

IV. BLOCK DIAGRAM

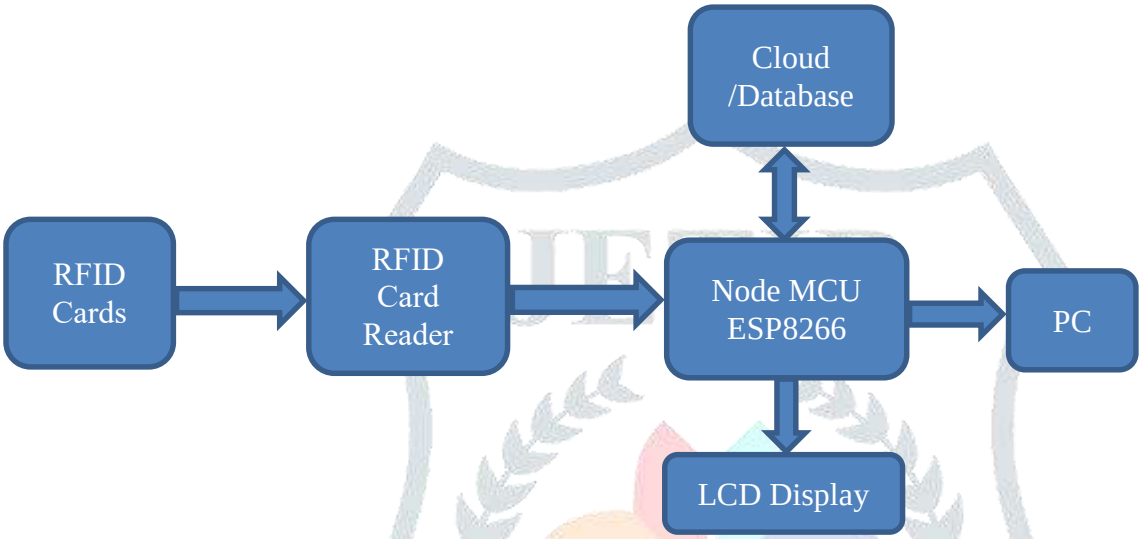

Figure 1: Block Diagram

V. HARDWARE DESCRIPTION

A. RFID Card Reader Module

Figure.2**:** RFID Card Reader Module

RFID reader can be called as Radio frequency Identification card reader. The RFID card reader is important for any RFID framework to function or work. This device can send and get radio waves for communicating with the Radio Frequency Identification Tags.

B. RFID Cards

Figure 3: RFID Cards

RFID card is the key of Radio Frequency Identification System. These RFID cards or tags transmits the data through the radio waves to Radio Frequency Identification Reader or Antenna. The RFID cards or tags do not require power or battery. Instead, it will receive energy from the radio waves which is generated by the RFID reader. When the RFID tags receives the data from the RFID reader, it receives energy passing through the internal antenna to the RFID tags chip. The transmission energy activates the chip. It modulates the energy with the proper information. Then it transmits the signal back towards the antenna or RFID reader.

C. Node MCU ESP8266 Wi-Fi Module

Figure 4: Node MCU ESP8266

The Node MCU ESP8266 is a Wi Fi module. The Node MCU is an open source Lua based firmware. The development of this board is specially for IoT based applications. It is a self-contained SOC with integrated TCP/IP protocol stack. It gives access to any microcontroller to Wi Fi network.

D. LCD Display

Figure 5: LCD Display

LCD stands for Liquid crystal display. A 16*2 alpha numeric display is used to display the measured data.

VI. IMPLEMENTATION

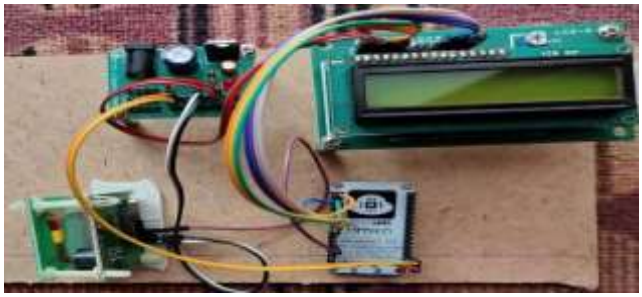

Figure 6: Hardware Implementation

The implementation of hardware of our project is shown in Figure 6. We use RFID card reader to scan the RFID tags where in which the radio waves transmit the signal from tag to reader. Then comes Node MCU ESP8266 Wi Fi module which sync the database server where the data is stored. LCD display is used to show the ID of the card and confirm about the accessibility of the card (whether access granted or denied). We also use a PC to display the output which is the details of the patient through the database server.

VII. FLOW CHART

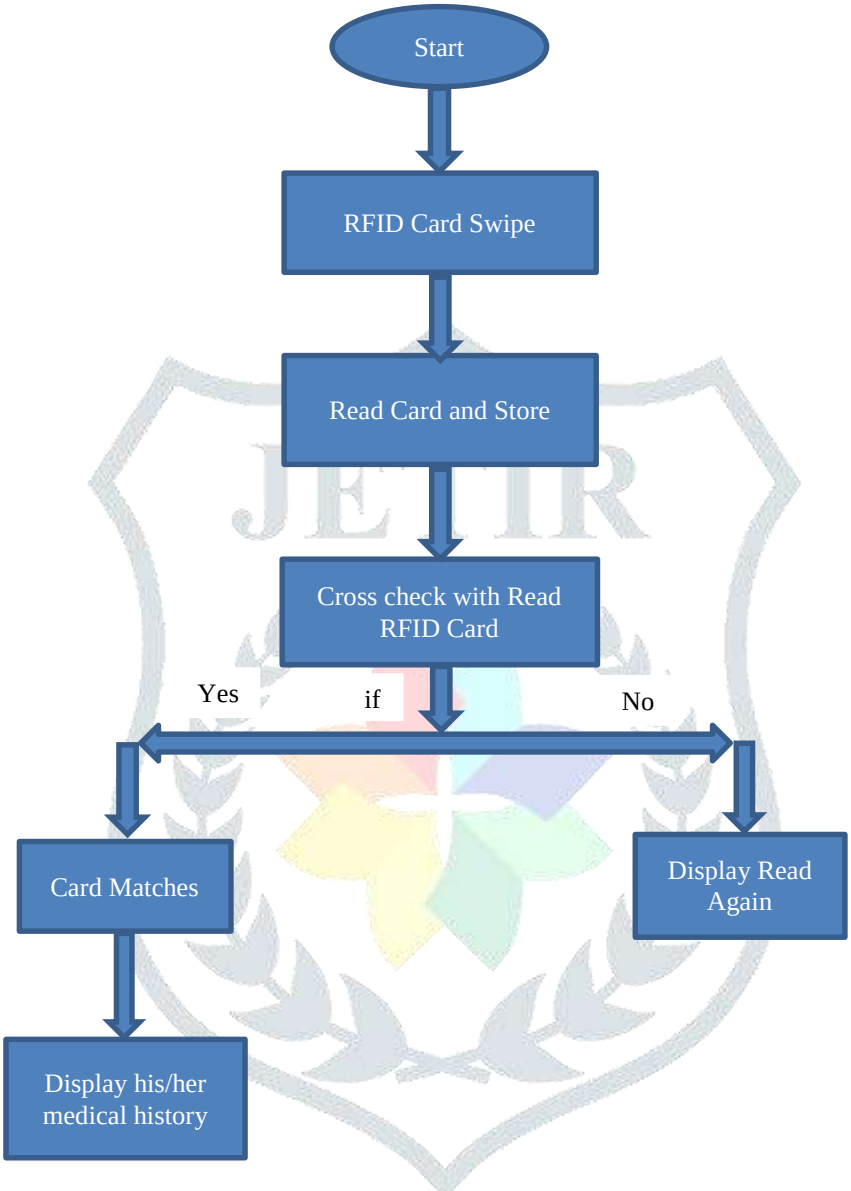

Figure 7: Flow Chart

It starts with swiping the given RFID card over the card reader. Then the swiped card will be read through the transmitted radio waves and the data will be stored and also checks for proxy card i.e., it checks that no two cards will have same ID. If the ID matches, then it triggers the database and the details of the patient is displayed.

VIII. SOFTWARE IMPLEMENTATION

The main asset of our project is the software implementation i.e., to store and access the medical history of the patient through database. We created local database server using localhost phpMyAdmin where we created required number of columns to display the details of the patient. We have written SQL code in phpMyAdmin open-source tool for MySQL in PHP. We used XAMPP as a cross platform web server package to create the database which consists of HTTP server, MySQL database for code written in PHP and Perl languages. We have written our code in SQL language.

When the tag is swiped or scanned by the patient with the XAMPP server is active, it directly triggers the database we created where we display the name, ID, date and time of the arrival of the patient and we also provide a link of google drive where the actual data of the patient which is the previous medical history is stored and displayed. So, when the drive is updated after consultation by the doctor frequently the data in the drive changes. Henceforth, when the patient goes to any other hospital, doctor of that hospital will know about the previous hospital the patient visited and the medications he received from that doctor.

So, he need not to ask the patient about his previous health issues. We have also written an Arduino code to access the localhost server database and to display the entry of a patient. We created the local database server using localhost in localhost:8080.
Arduino is a open-source software. The Arduino integrated development environment (IDE) is a cross-platform application (for Windows, MacOS, Linux) that is written in functions from C, C++. I t is used to write and upload programs to Arduino compatible boards. The Arduino IDE supports the languages C and C++ using special rules of code structuring. The Arduino IDE supplies a software library from the wiring project, which provides many common input and output procedures. User-written code only requires two basic functions, for starting the sketch and the main program loop, that are compiled and linked with a program. The Arduino IDE employs the program to convert the executable code into a text file in hexadecimal encoding that is loaded into the Arduino board. By default, avrdude is used as the uploading tool to flash the user code onto official Arduino boards.

IX. RESULTS AND DISCUSSION

When the RFID card is swiped, the data directly triggers the database where we have created a table in localhost using phpMyAdmin which displays the details of the patient. The structure of the table created is shown in Figure 8.
The table consists of ID of the patient, date and time of the arrival, the URL links which redirects to the google drive where the previous medical history of the patient can be seen. The port which we have used in localhost to display the table is 8080.

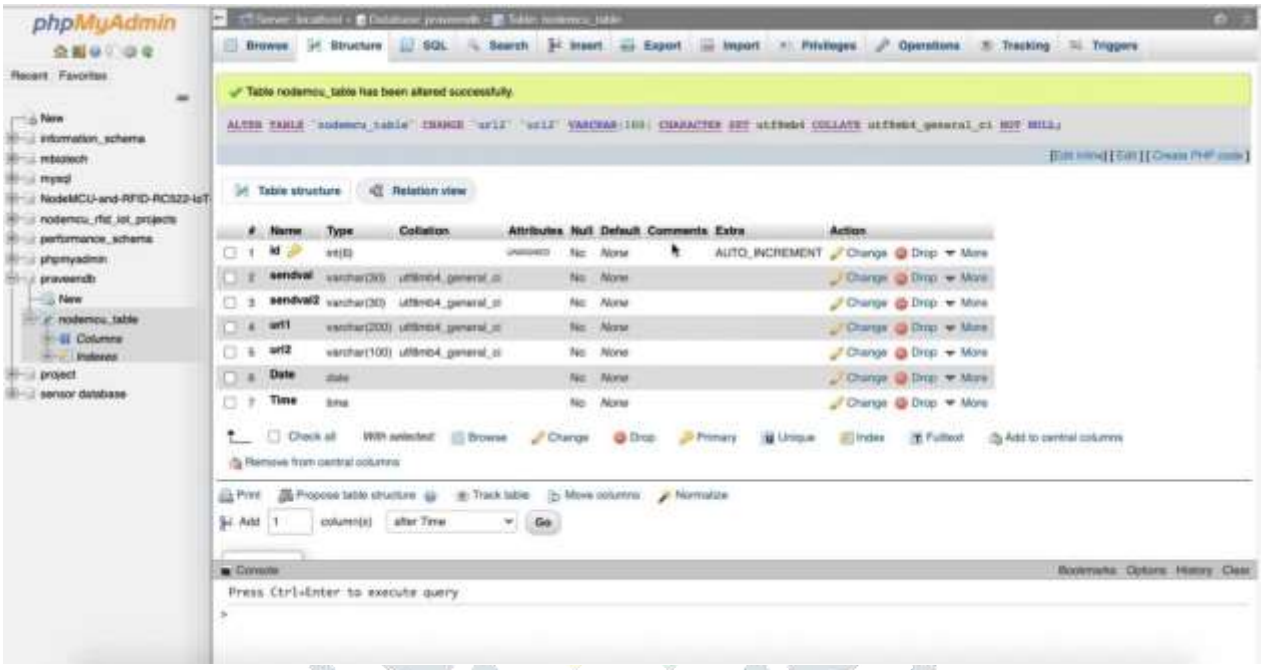

Figure 8: Structure of the table as seen in localhost PhpMyAdmin

Figure 9: Output seen in database which includes ID, date, time and link of google drive where details of the patient are shown

Figure 10: Details of the patient seen through google drive

X. CONCLUSION AND FUTURE SCOPE

One of the problems in healthcare/hospitals is maintaining the records of the patient and smooth management. This project is mainly used to obtain information about the details of the patient's health history which can be stored in the cloud and can be accessed by any hospital.

This technique can be used not only in hospitals but also in many industries, IT companies in monitoring the staff. By incorporating biometric application would serve to further increase the security of the system.

In future, real-time registration of new patient can be directly updated to database by creating an application-level software. Usage of High Frequency (HF) active RFID tags against Low Frequency (LF) RFID tags for better performance and flexibility of users.

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