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Automation of Education System

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ABSTRACT: A school management system is intended to assist teachers in grading tests, monitoring student attendance, sharing class notes, developing lesson plans and in-depth reports, and corresponding via email with other staff members, pupils, and parents. The automation helped to reduce the time required to generate Excel by a considerable amount thus benefiting the Institution and reducing human error. It also aims to reduce the workload of the teachers by doing repeated manual tasks (such as entering the attendance details, manually creating excel sheet for each subject). Thus, with automation the teachers can focus on the more important tasks such as designing more good content and the study materials. This project is done to simplify attendance recorder system by using RFID.

KEYWORDS – Automation, RFID, Server, Database

I. INTRODUCTION

Professors now take attendance by shouting out names or passing a sheet of paper in the majority of colleges and universities. They both have disadvantages that are specific to them. Hence, the college must develop a system to track each student's attendance, automatically inform their parents, and provide a report on their exam results over the internet. With the help of RFID, this project will make the attendance recorder system simpler. Radio frequency identification (RFID) is the process of identifying and tracking tags using radio frequency waves. Using a variety of modulation and encoding algorithms, it is a wireless method of communication that makes use of electromagnetic and electrostatic coupling in the radio frequency region of the spectrum to communicate between reader and tag. RFID stands for Radio Frequency Identification.

RFID systems, at their most basic, employ tiny chips called tags to transmit identification information to an RFID reader, which can subsequently communicate with computers. The RFID-based GSM student attendance system with parent notification uses RFID technology. It makes use of a passive RFID reader with a 15 cm maximum detection range. It runs at 125 kHz on a 12V power source and keeps track of the students' attendance. Users only need to place their RFID tags on the RFID reader in order to take attendance. To find their name, they do not need to go through the enormous catalogue. As a result, it is a time-saving method.

If the encoded tagged ID scanned and the one that is kept in memory are the same, attendance will be taken. Should this occur, the user sees an error message. For the user to examine information about the students, including the percentage of attendance, grades, and other statistics, a web interface and a mobile application will also be offered. Teachers have access to that to view and update. The view, however, is solely for students.

The process of using technology to improve business operations is known as digitalization. Digitalization and digitization will aid schools and colleges in increasing productivity and preserving the environment by doing away with paper use. By utilising technology, educators may better understand each student's areas of weakness, close the achievement gap, and improve system transparency.



II. PROBLEM DEFINITION

Most information is kept in manual form in modern education, including files, excel sheets, and pen and paper modes. This process takes a long time and is prone to mistakes made by humans. The fact that data is not immediately available is this system's main drawback. Teachers are overworked, which causes them to become weary and affects how well they perform. Dealing with blemishes on physical media is a laborious process that increases the risk of error when data is shared with another department. The end user cannot obtain data immediately since it is being handled manually, which frequently results in human error that results in data loss.

III. METHODOLOGY

The working of the project will be divided into 2 parts first will be the collection of the attendance details and second will be importing the student marks and storing them for easy access.

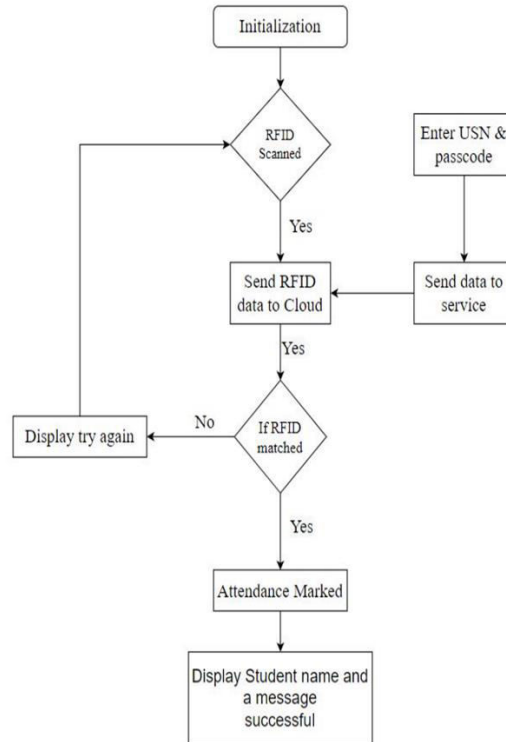
The implementation of the RFID based attendance is as follows.

- 1.Initialize all the components and establish the connection with the server.
- 2.Register all the student id cards against their USN number.
- 3.Check whether the RFID is scanned by the student.
- 4.If scanned then fetch the data and pass it on to the Server via ESP8266.
- 5.Match the given RFID with the student data present in the database and if matched mark the attendance for the day.

If RFID doesn't match, then display try again and there will be a manual method for them to register in case RFID doesn't work.

All the available data present in the database will be accessible to the students and faculty with the help of web portal and mobile application.

Faculty can edit the data and students will only have the view access. The website will allow the users to interact with the server and view and edit the data that are required and provide in depth view about the students such as their performance and weakness. The mobile app will provide the web type interface from a mobile friendly way. The app will also be used for sending notes, requesting leaves and also act as a bridge between the parents and the teachers.



Website and Mobile App

The website and mobile app will be the mode of communication between the teachers and students. All the data is stored on server and accessed whenever required by the user and displayed to them. The web will be build using front end frame works such as react, a popular JavaScript framework.

The mobile app will be built on the flutter framework that is based of the dart language and is widely used and because of the security provided and the performance offered by this light wight framework.

A framework is a predefined template that is used for development of modern-day application and webpages as they provide faster development time and also help to streamline the process of development.

IV. BLOCK DIAGRAM

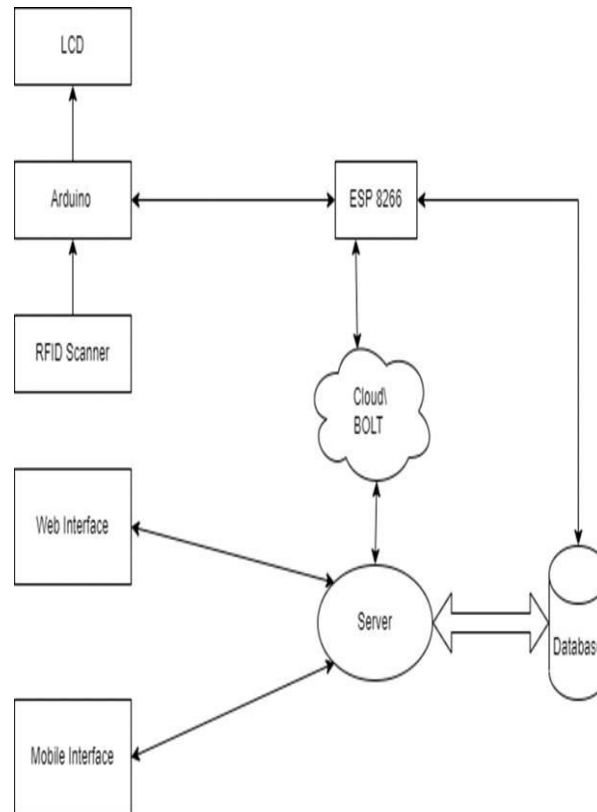


Fig 2 : Block diagram of Overall Architecture.

V.MATERIALS

A. Arduino Uno

The Microchip ATmega328P microcontroller serves as the foundation for the Arduino Uno, an open-source microcontroller board created by Arduino.cc. Both digital and analogue input/output (I/O) pin sets are present on the board.

B. ESP 8266

The Express if Systems firm in Shanghai, China, manufactures the ESP8266, a low-cost Wi-Fi microprocessor with integrated TCP/IP networking software and microcontroller capabilities. The ESP-01 module, created by a third party, helped make it more well-known in the English-speaking maker community in August 2014.

C. RFID Scanner and Tag

One of the least expensive RFID solutions you can purchase online for under \$4 is the NXP RC522 RFID module based on the MFRC522 IC. It often comes with a key fob tag with 1KB of memory and an RFID card tag. The finest thing is that you can save any message in it because it has the ability to write a tag. As a result, it can be altered.



VI. CONCLUSION

In this work, we have developed an entire school management system, this software allows the works to be carried out in the school at a much faster rate and also can be used to find the information of each and every student seamlessly.

Each student's performance can be tracked and viewed by the teachers to find the students weakness and also help them to rectify their weakness. Developed a web interface and a mobile application for both the faculty, student and management. Thus reducing the workload of the teachers and other faculty members.

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