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Smart Attendance for Covid-19 Precaution

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Abstract— Due to the COVID-19 pandemic, hand hygiene and sanitization have become critical in preventing the transmission of the virus. To address this need, a project has been developed to create a safe and secure attendance monitoring system for educational institutions and other offices where attendance tracking is required. The system includes a low-cost smart hand sanitizer dispenser with temperature sensors and RFID technology that is connected to the entrance door. Before accessing the building, individuals must undergo temperature checks and hand sanitization using the smart dispenser. The system eliminates the need for manual attendance tracking, reduces manpower, and ensures compliance with hand sanitization protocols. The project utilizes IoT and sensors for automated temperature checks and hand sanitization.

Key words: Arduino, Automation, Cell phone.

I. INTRODUCTION

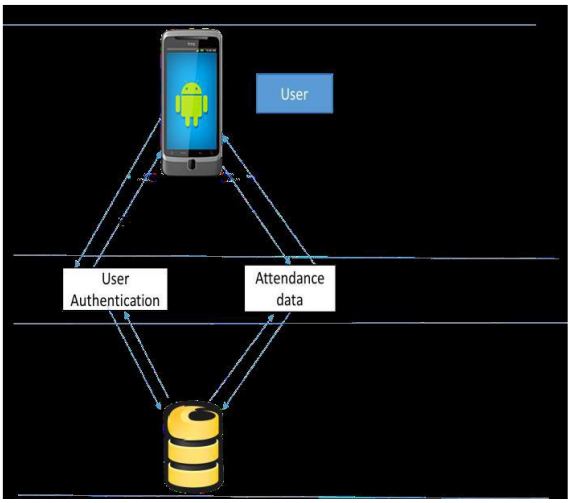
The system will work by detecting the presence of a person using the sensors and opening the door automatically. The RFID technology will be used to track the attendance of individuals and the hand sanitizer dispenser will be activated as soon as the person enters the room. This will ensure that individuals entering a premises will have their hands sanitized, and their attendance will be recorded without any physical contact.

In addition, the system will be connected to the internet to provide real-time attendance records and data analytics. This will help the management to track the attendance of employees or students, and the usage of the sanitizer dispenser. The data collected can be used to identify areas where improvements are needed and also to ensure compliance with health and safety regulations.

The implementation of this project will not only provide a contactless and safe attendance system, but it will also help in the prevention of the spread of the COVID-19 virus. The low-cost design makes it accessible for installation in different institutions, which will have a significant impact on hygiene and safety measures.

The COVID-19 pandemic has brought forth the importance of hygiene practices and the need for innovative solutions to tackle the challenges that have emerged. The implementation of the smart hand sanitizer dispenser with door controller and attendance records will provide a safe and contactless attendance system, while ensuring that hygiene measures are maintained.

II. SYSTEM ARCHITECTURE AND WORKFLOW OF REFERENCE MODEL



1 Admin registration

The first step in this application is to get the teaching faculty to register. The respective person will then provide his or her phone's e-mail id and password for registration. An OTP would be then sent via e-mail address on the phone by the admin. 5

2 Admin login

After registering the admin is allowed to log in. He or she can now view admin homepage where there are options to take attendance, upload results.

2.2.3 Take attendance

Here, system will validate admin to check whether admin is applicable to take attendance for any subject which he/she selected from the application after validation is success. If admin is legitimate to takeattendance and applying the operation at correct lecture time, now he can take attendance

2.2.4 Upload result

Admin can upload student's attendance through application. The same authentication will be performed by system as Take attendance module.

2.2.5 Upload final attendance sheet

A report is generated which has the student's name, roll no., his or her attendance. This module categorized student according to their attendance.

II. BLOCK DIAGRAM

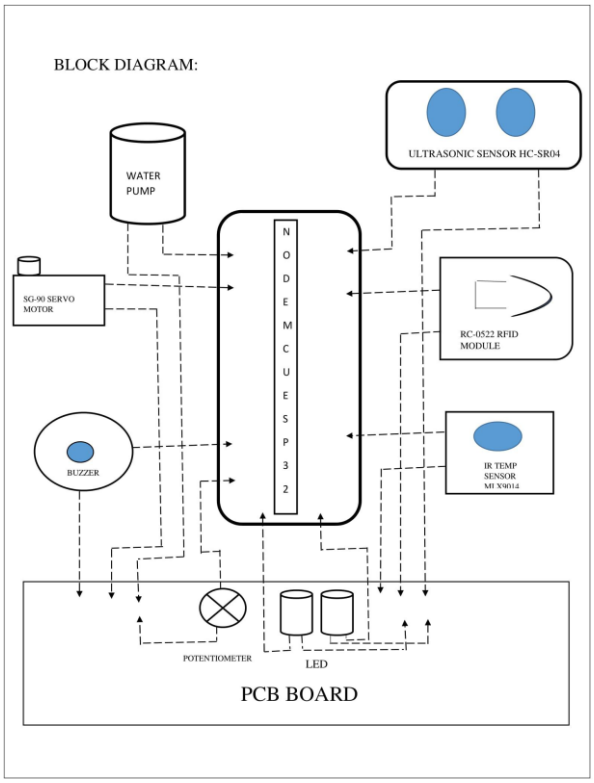


Fig.2 Block Diagram

As shown in the figure 2, all the components like IR sensor, RFID Module, Ultrasonic sensor, Servo motor, Buzzer, Water pump, Potentiometer and LED are connected to the Node MCU. Also LED and Potentiometer is simultaneously connected to the PCB board. As we switch on the device, the sensors attached to the Node MCU gets activated. We have two systems to work simultaneously to each other. First the automatic sanitizer and secondly the contacted temperature sensing.

The ultrasonic sensor and IR sensor is attached to the Node MCU for detection of human/object ranging and motion respectively.

IR temperature sensor has a range of around 90 degree field of view and any detection in the specified range will activate the sanitizer and it will sanitize the surroundings with activation of spray pump 1 accompanied with a blower so that the sanitizer reaches the surrounding . The ultrasonic sensor on the other side has been specified with a range of less than 10cm, any movement especially hand near (<10cm) the device will activate the spray pump and the sanitizer reaches the hand through a small pipe.
The sanitization is done simultaneously with the activation of the sensors, keeping the particular region sanitize and free from virus or bacteria or any infectious agents.
The temperature sensor senses the body temperature of the person as soon as it is touched, and displays the temperature in degree Fahrenheit in the program running in the background of Arduino IDE. If the temperature sensed is above the normal body temperature(98° F) the buzzer starts alarming and the RGB led attached turns red, if the sensed value of the sensor is equal or below 98° F then the buzzer is off and the RGB led is green. Depicting a symbol of safe and safety.

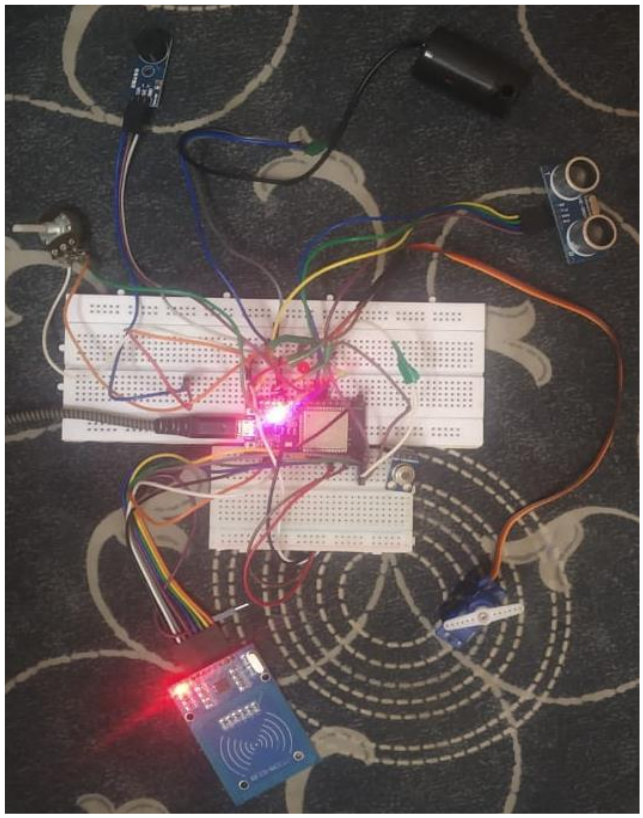


Fig.3 Actual Hardware

Hardware
Components Required:

1. NodeMCU ESP 32-S
2. Infrared sensor
3. Ultrasonic sensor LV Maxsonar equivalent MB1040
4. Sanitizer Pump
5. RFID RC522
6. Rotary Potentiometer
7. SG90 Servo motor
8. Buzzer
9. Light emitting diode (LED)
10. Bread Board

IV Advantages of ROPOSED System

The above system offers several advantages:

Time-saving: The system helps automate the attendance-taking process, saving time for both teaching faculty and students. It eliminates the need for manual attendance tracking, which can be time-consuming and prone to errors.

Improved accuracy: The system's authentication and validation processes help ensure that the attendance data is accurate and reliable, reducing the chances of errors and fraud.
Easy access to attendance data: The system provides easy access to attendance data, making it easier for teaching faculty to track students' attendance and identify any issues that may arise.
Simplified report generation: The system generates a report that includes the student's name, roll number, and attendance status, making it easier for teaching faculty to analyze attendance data and take appropriate action.
Increased transparency: The system helps increase transparency in the attendance-taking process, making it easier for students and teaching faculty to keep track of attendance and ensure that all students are attending classes as required.

Overall, the above system can help improve the attendance-taking process, save time and effort, and increase accuracy and transparency.

VI. CONCLUSION

The system surely help in implementing the hand hygiene without any challenges as it is a must to sanitizer if you are to access any entry point. It is much safer and more recommended due to its touch less property which zeros down any chances for cross-contamination.

The smart and contactless hand sanitizer system which consists of door monitoring, temperature checking and attendance system can help in completely eliminating any contact between two or more humans. The method and technology implemented in this project is to reduce and stop the transmission of spreading COVID-19 virus and can also observe some necessary parameters like person's body temperature using contact less infrared temperature senor, and if high temperature then generate alarm, marking attendance without any paper work instead it will directly provide required data on sheet.

The main advantage of this system being cost efficient. It can be installed in offices, educational institutes, etc. also it can also help in controlling the further spread of the ongoing pandemic. All the devices communicate well moreover the system has been successfully implemented and the aim is achieved.

To draw a concluding line to the project it can be said that in a war with an invisible enemy the device is a weapon for survival in this pandemic situation.

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