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Sync Alert Notice Board

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Abstract: *The SyncAlert Notice Board project represents a significant advancement in communication technology, leveraging a sophisticated integration of hardware components to create a versatile communication hub. At its core, the project features a 45x6 LED matrix, enabling vivid and customizable display capabilities for messages and notifications. This matrix is complemented by an RTC (Real-Time Clock) module, ensuring accurate timekeeping and scheduling functionalities essential for managing events and deadlines effectively.*

In addition to visual communication, the project incorporates an MP3 module, adding an auditory dimension to message delivery and enhancing user engagement. The integration of a Bluetooth HC05 module further enhances the project's utility by enabling seamless wireless transmission of data, allowing users to update the notice board remotely and in real time. This combination of features transforms the SyncAlert Notice Board into a dynamic and interactive communication tool suitable for a wide range of environments, from educational institutions to corporate offices.

By addressing the specific needs of users for efficient information dissemination and scheduling management, the SyncAlert Notice Board project offers a comprehensive solution that not only streamlines communication but also enhances organizational productivity and engagement. Its versatility, coupled with user-friendly functionality, makes it an invaluable asset for any setting where clear and timely communication is paramount..

Keywords: SyncAlert Notice Board, LED matrix, RTC module, MP3 module, Bluetooth HC05, wireless communication, scheduling, user engagement, dynamic communication, productivity enhancement

I. INTRODUCTION

The SyncAlert Notice Board project stands as a groundbreaking achievement in the realm of communication technology, seamlessly merging hardware integration with cutting-edge features to give rise to a remarkably versatile communication hub. Central to this innovation is a 45x6 LED matrix, the cornerstone of the project, offering unparalleled customization options for displaying messages and notifications with vivid clarity and precision.

What sets this project apart is its comprehensive integration of key components that significantly enhance its functionality. An RTC (Real-Time Clock) module ensures not only accurate timekeeping but also facilitates precise scheduling, essential for managing events and deadlines with utmost efficiency. Additionally, the incorporation of an MP3 module introduces an auditory dimension, enabling the delivery of audio alerts that further engage users and enhance the overall communication experience.

Moreover, the integration of a Bluetooth HC05 module catapults the SyncAlert Notice Board into the realm of seamless wireless data transmission. This capability empowers users to update the notice board remotely and in real time, breaking barriers and enabling dynamic communication in a variety of settings.

The overarching goal of this project is to streamline communication processes and catalyze productivity across diverse environments. By delving into the intricate components, functionalities, and the vast potential applications of the SyncAlert Notice Board, this paper aims to shed light on how this innovative tool can significantly enhance organizational communication and management strategies.

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II. LITERATURE SURVEY

The Arduino based clock use an MP3 shield with SD card, an LCD display and a Real Time Clock module (RTC) .

1. Android Based Wireless Notice Board and Printer. (December 2015) Prof. Sudhir Kadam, Abhishek Saxena, Tushar Gaurav. This project deals about an advanced Hi-Tech wireless Notice Board. This system is enhanced to display the latest information through an Android application of smart phones or tablet. While user sends the message from the Android application device, it is received and retrieved by the Bluetooth device at the display unit. The Bluetooth access password password will only be known to the user, it is then sent to the microcontroller that further displays the notice sent from the user on the electronic notice board which is equipped with a LCD Monitor display. It uses an Arduino system system (AVR microcotroller) to control the operation. Bluetooth wireless technology is becoming a popular standard in the wireless technologies. "Wireless printers" refers to printers to printers in which a radio frequency (RF) connects the printer to the network, a controlling PC, a handheld computer or both.

2. Neeraj Khera and DivyaShukla, IEEE 2016 has developed a simple and low-cost Android based wireless notice board. They proposed system uses either Bluetooth or Wi-Fi based wireless serial data communication. For this purpose, Android based application programs for Bluetooth and Wi-Fi communication between Android based personal digital assistant devices and remote wireless display board are used. At receiver end, a low-cost microcontroller board (Arduino Uno) is programmed to receive and display messages in any of the above communication mode. Using the developed system, two different applications for displaying messages on a remote digital notice board and wireless person calling has been implemented. The developed system will therefore aim in wirelessly sharing the information with intended users and helps in saving the time and the cost for paper and printing hardware.

3. Prof. Madhavi Repe, Akshay Hadoltikar, Pranav Deshmukh, Sumit Ingle 2016 This paper presents a model about advanced wireless notice board. The project is build around ARM controller, Raspberry-pi which is most important in this system.Display is obtained on LCD monitor display. Remote control is the most popular system nowadays. The main objective of this project as described in the project is to develop a wireless notice board which can receive and display message sent from the user. The project aims atdesigning A LCD monitor based message display controlled fom an Android mobile phone. The proposed system has a provision to communicate from Android phone to LCD display board. Range of communication is large. Android contains a full set of tools that have been built from the ground up alongside the platform providing developers with high productivity and deep insight into their applications.

4. S. Rubin Bose and J. Jasper Prem IJRIER 2017 In GSM based LED scrolling display board, GSM modem communicates with the microcontroller through asynchronous serial communication. The microcontroller transmits a set of AT commands to read the message sent by the user. The quick display of message using wireless data transfer in smart notice board. The GSM based system offers flexibility to display faster than the programmable system. This system is easy, robust, to use in normal life by anyone at anyplace with less errors and maintenance. The paper titled as design and implementation of multiple LED notice boards by using ZIGBEE Technology states that the proposed system is handled by numerous transmissions and the message feeds on only one receiver. Microcontroller controls multiple LEDs to enhance the message pattern. Here the distance of wireless communication is limited, and this method is not suitable for long distance communication.

5. M. Arun, P. Monika and G. Lavanya IJCAT 2017 The Raspberry Pi2 system acts as the central server of the proposed system and the Notice boards are accessible only by logging in with the proper credentials within the raspberry-pi server. Raspberry Pi2 acts as the server for this e-Notice board system. It's connected to internet employing a correct IP Address, so a certified user of this system can login from anyplace. Raspberry Pi is connected to the intranet network additionally. The display system in school area one will be having an Arduino board with an Ethernet Shield and an LCD Display hooked up with it. With the help of the Ethernet shield the display node is connected to the computer network. In school area two, the Arduino relates to a Wi-Fi shield and an LCD Display and this node are also connected to the intranet through Wi-Fi. These devices will also have a valid IP address assigned towards them.

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III. ANALYSIS OF PROBLEM

In the analysis of the identified problems, it's crucial to delve deeper into their implications and impact on the overall system functionality. Here's a refined version of the analysis focusing on the significant impact of each problem:

A. Bluetooth Range Limitation

- Hinders communication in environments requiring long-distance data transmission, such as industrial settings or outdoor applications.
- Limits the use of Bluetooth-enabled devices for applications requiring seamless connectivity across larger areas.

B. Internet Dependency for Wi-Fi Module

- Renders the Wi-Fi module non-functional in scenarios with no internet access, limiting its usability in offline environments or during network outages.
- Increases system vulnerability to disruptions in internet connectivity, affecting critical operations dependent on Wi-Fi communication.

C. Compatibility of ARM Controllers

- Poses challenges in integrating ARM-based systems with existing hardware or software ecosystems, potentially leading to compatibility issues and increased development time.
- Limits the scalability and interoperability of the system, restricting its ability to adapt to evolving technological requirements or incorporate diverse components.

D. Raspberry Pi Power Consumption and GPIO Limitations

- Increases operational costs and energy consumption in power-sensitive applications, affecting overall system efficiency and sustainability.
- Constrains the device's capability to interface with a wide range of peripherals or sensors, limiting its versatility and applicability in complex projects.

E. Data Transfer Rate Limitation of GSM

- Impedes real-time data transmission and communication in applications requiring high-speed connectivity, such as remote monitoring or multimedia streaming.
- Hampers the efficiency of data-intensive tasks, leading to delays, bottlenecks, or compromised user experiences.

By addressing these significant impacts, stakeholders can better understand the implications of the identified problems and strategize effective solutions to mitigate their adverse effects on system performance and functionality.

IV. METHDOLOGY

Techniques

In these project we cobined 2 project In one that is given in the flow chart

The project begins with initializing hardware components, followed by developing the attendance confirmation mechanism and alert generation system. Testing, calibration, and documentation ensure reliability. Embracing pragmatism, sampling involves diverse stakeholders. Data collection combines surveys, experiments, and observations. Triangulated analysis ensures validity. Reflexivity addresses biases. Results are shared openly.

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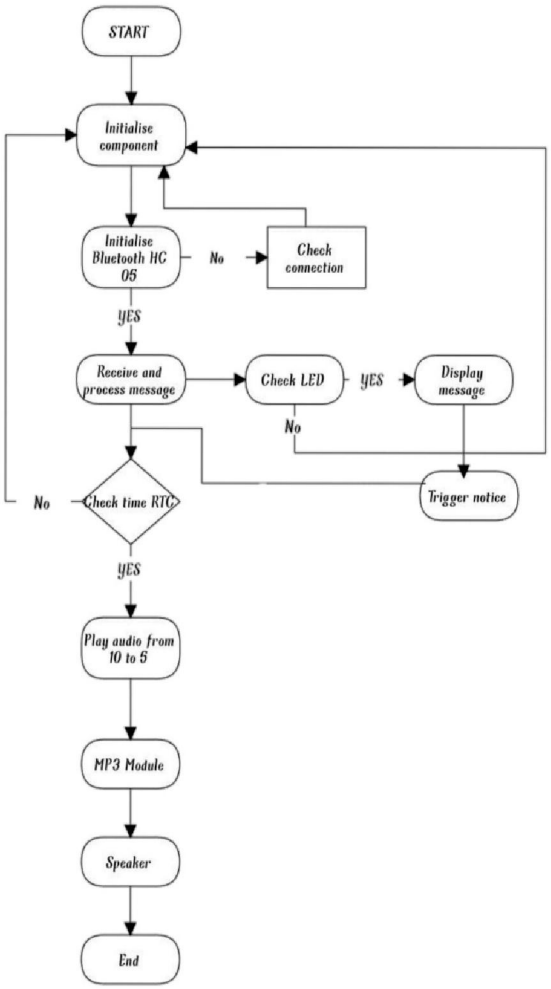

Fig 1. Flow chart

The first we connect the 400 LED's and solder it in proper manner.

Then using bellow circuit diagram we connect all the components

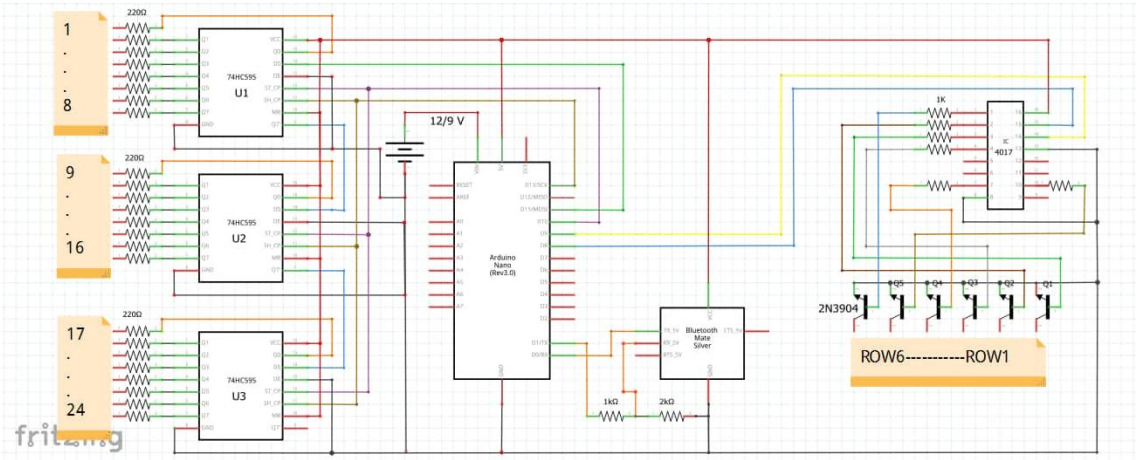

Fig 2. LED display circuit diagram

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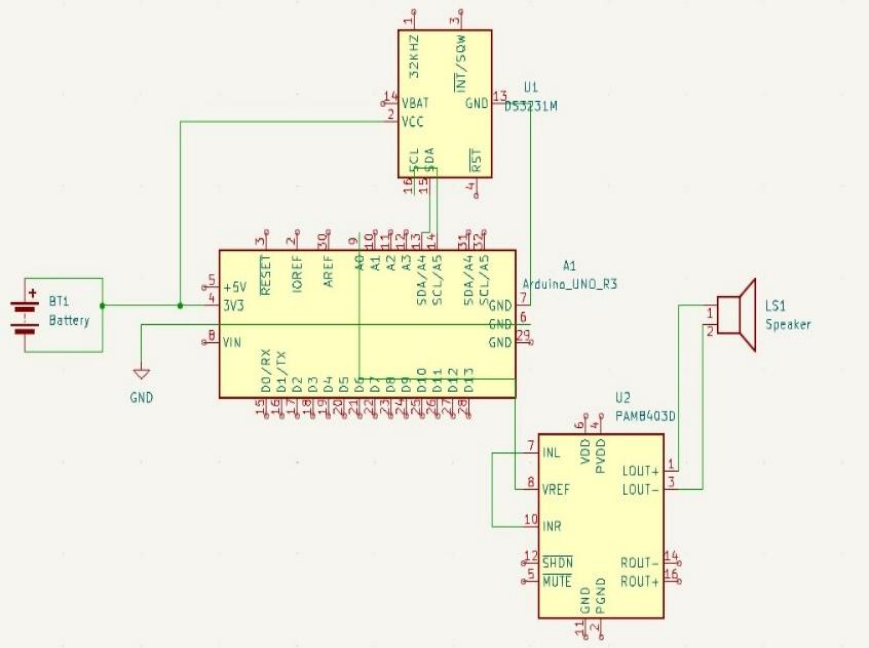

Fig 3. Alert Board circuit diagram

The sync alter notice board operates through a central control unit receiving data from a synchronized source. It processes information and updates the notice board display accordingly. Users interact with the system through input devices, while the display output provides synchronized content for effective communication and engagement. Bellow is the code that we using in our project.

CODE

```
//Include Statements and Definitions
#include "SD.h"
#include "TMRpcm.h"
#include "SPI.h"
#include <DS3232RTC.h>
#include <Streaming.h>

#define SD_ChipSelectPin 4
//Global Variables
TMRpcmtmrpcm;
DS3232RTC myRTC;
//Function Declarations
void setup();
void loop();
void playAudio(const char* filename);
void printDateTime(time_t t);
void printTime(time_t t);
void printDate(time_t t);
void printI00(int val, char delim);
//Setup Function
void setup() {
  // Initialize Serial communication
```

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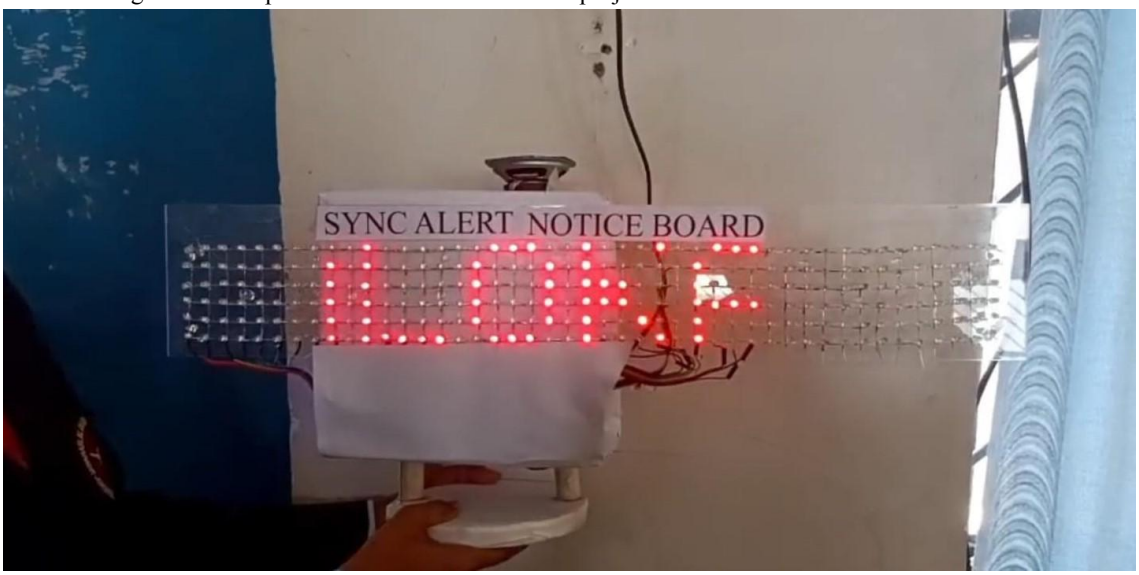
```
Serial.begin(9600);

  // Initialize SD card
  if (!SD.begin(SD_ChipSelectPin)) {
Serial.println("SD initialization failed!");
    return;
  }

  // Initialize audio player and RTC
tmrpcm.speakerPin = 9;
tmrpcm.setVolume(5);
myRTC.begin();
setSyncProvider(myRTC.get);

  // Check RTC synchronization
Serial.println("RTC Sync");
  if (timeStatus() != timeSet) {
Serial.println("RTC synchronization failed!");
  }
}
//Main Loop
void loop() {
  // Handle time-based events
  // Check if it's a specific hour and minute, then play audio accordingly
  // Also print date, time, and temperature
  // Continuously check for updates in time
}
```

The above code gives us the specific detail instruction of the project.



FINAL PROJECT PHOTO

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V. CONCLUSION

The proposed system offers an intelligent and eco-friendly notice board solution, facilitating message reception, storage, and dissemination via LED screen displays and voice announcements. With a focus on sustainability, it reduces manpower requirements, ensuring swift data exchange while remaining cost-effective. Incorporating user authentication mechanisms prevents misuse, while leveraging advanced technologies like Arduino, RTC module, and MP3 module ensures precise output delivery, enhancing overall effectiveness.

The Sync Alter Notice Board project has effectively realized a synchronized communication system, significantly enhancing the efficiency of information dissemination. By meticulously designing and integrating input devices and display outputs, the project has successfully facilitated seamless communication. Moving forward, potential iterations could concentrate on feature expansion and optimizing user interaction to further enhance utility and accessibility.

The proposed system introduces an intelligent and environmentally conscious notice board solution. This innovative platform streamlines message reception, storage, and dissemination through LED screen displays and voice announcements. With a focus on sustainability, it reduces manpower requirements for information dissemination, ensuring rapid data exchange while maintaining cost-effectiveness throughout implementation and maintenance phases. This project offers an efficient method of delivering messages on a Notice Board utilizing Wireless Technology. Additionally, it integrates user authentication mechanisms to prevent system misuse effectively. Leveraging cutting-edge technologies such as Arduino, RTC module, and MP3 module, the system guarantees precision in output delivery, thereby enhancing overall effectiveness.

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