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Automatic Time-Based Bell for Schools and Colleges

Ms. Sarada Avula[1], Anjali Burra[2], Alugubelli Sathvika[3], Banda Laharika[4]
[1, 2, 3, 4]*ECE Dept, G Narayanamma Institute of Technology & Science Hyderabad,Ts India*

Abstract: ***This paper attempts to implement Time based automatic bell system for schools and colleges with voice notes. The Time-Based Auto Ring System is an advanced solution designed to improve the sound systems of institutions such as schools and colleges. The system includes various components such as APR33A3 module, LCD display (1088AS), relay module (JQC3F), DS3231 RTC module. it continuously runs once time is fixed and 8-ohm speaker. Together, these components allow the sound to be synchronized at a specific time. The APR33A3 module is used as the main audio source in the system. It includes a set of pre-written voice notes that can be customized for the specific needs of the school. The high-performance feature of the module provides good sound quality through an 8-ohm connection. The LED display (1088AS) shows current time and related messages. This improves the user experience of the system and allows administrators to effectively manage the playback process.***
Keywords: Arduino UNO, DS3231 RTC, LCD display (1088AS), Relay module

I. INTRODUCTION

Management of processes and time in schools and universities is important for good teaching, learning and the whole organization. Traditionally, manual bell machines have been used to indicate the beginning and end of lessons, breaks, and other important events. However, these systems are often prone to inconsistencies and human errors and require ongoing maintenance. It is very important to use the time to solve these problems and use automatic noise control to improve performance. This guide explores the basics and advantages of using automatic alarm clocks designed specifically for schools and colleges. By using modern technologies such as microcontrollers and programmable devices such as Arduino, schools can improve their time management processes and ensure and solve various types of problems. The automatic ringtone machine works according to schedule without the need for human intervention. It provides auditory or visual signals by making changes during special times, between classes, breaks and other important times of the day. With this system, teachers and students can focus on multitasking activities without being distracted by human error or slow manual alarms. The main element of the system is the Arduino microcontroller, known for its simplicity, accessibility and ease of use. Arduino can be used to create solutions that meet the specific needs of schools and colleges. By integrating the Arduino with a real-time clock and a suitable device (such as a speaker or siren), an automatic sound can be triggered at just the right time.

II. FIGURES AND BLOCK DIAGRAM



Figure 1. ARDUINO UNO

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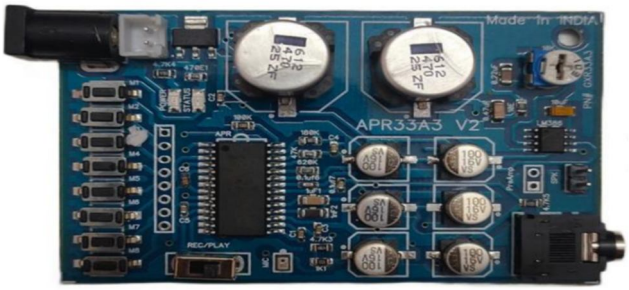


Figure 2. APR33A3 VOICE RECORDER

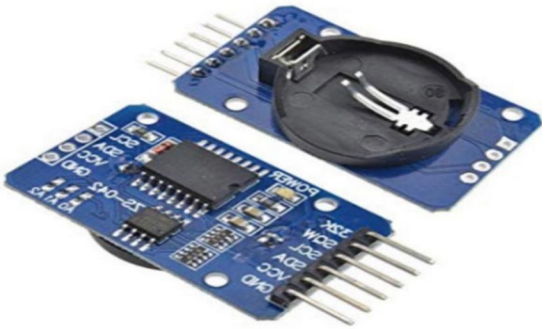


Figure 3. REALTIME CLOCK(DS3231)



Figure 4. RELAY MODULE

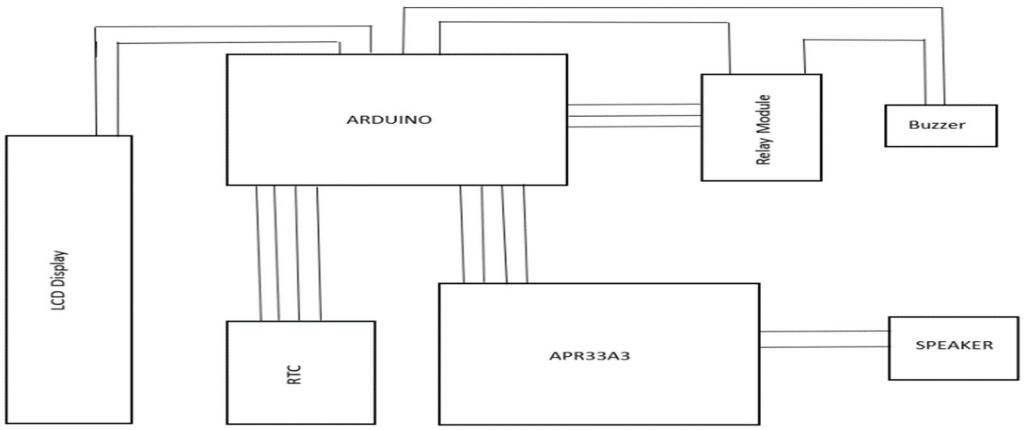


Figure 5. BLOCK DIAGRAM

III. CONNECTIONS

CONNECTIONS FOR AURDUINO TO VOICEMODULE

AURDUINO	VOICE MODULE
PIN-4	M1
PIN-5	M2
PIN-6	M3
PIN-7	M4

CONNECTIONS FOR AURDUINO TO REALTIME CLOCK

AURDUINO	REALTIME CLOCK
AREF	SCL
AREF	SDA
3.3V	VCC
GND	GND

CONNECTIONS FOR AURDUINO TO LCD

AURDUINO	LCD
5V	VCC
GND	GND
PIN-4	CS
PIN-11	CLK
PIN-13	DIN

CONNECTIONS FOR AURDUINO TO RELAY MODULE

AURDUINO	RELAY MODULE
PIN-8	IN
GND	GND
5V	VCC

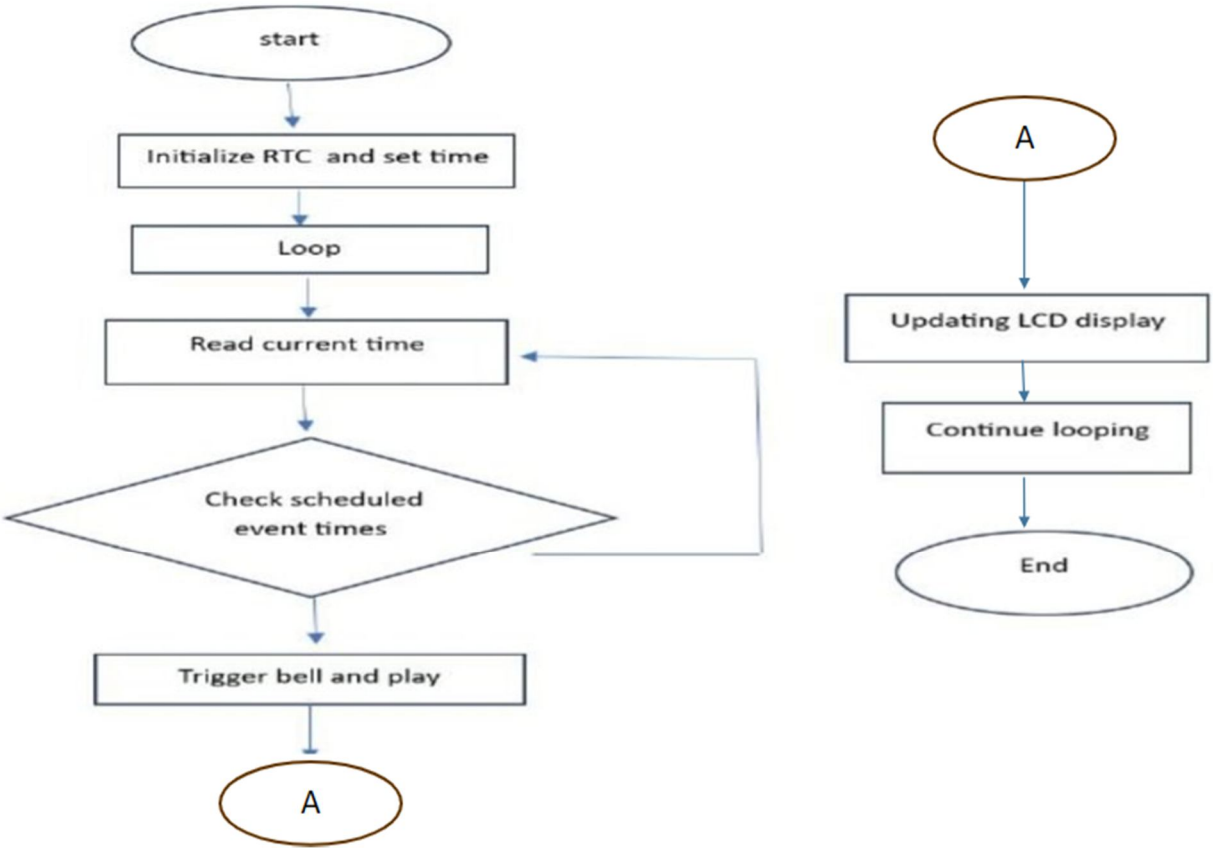
IV. FLOWCHART

Coming to the execution of Automatic Time-Based Bell for Schools and Colleges after initializing time into RTC. RTC module provides the current time to the microcontroller .The voice module is used to play the bell sounds or voice messages.The relay module is used to turn on bell or buzzer.

The system works as follows:

1) The microcontroller reads the current time from the RTC module.
2) The microcontroller compares the current time to the class schedule.
3) If the current time matches a class time, the microcontroller triggers the relay module to turn on the bell or buzzer.
4) The microcontroller also plays the bell sound or voice message for the class.

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V. RESULTS

In this project one can observe results when the time matches with time set in the code , when it matches time buzzer produces sound later it provides voice which we have recorded followed by name of the subject and name of the teacher parallelly it displays the time and name of the teacher on the LCD.

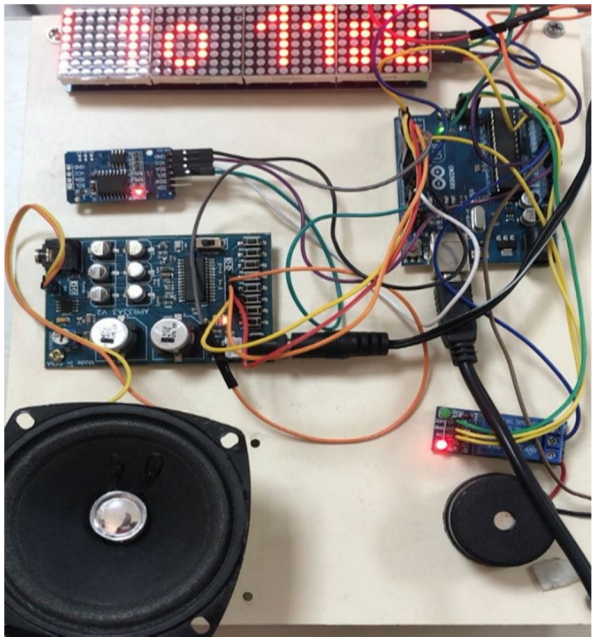


Figure -6: figure represents ouput message on LCD

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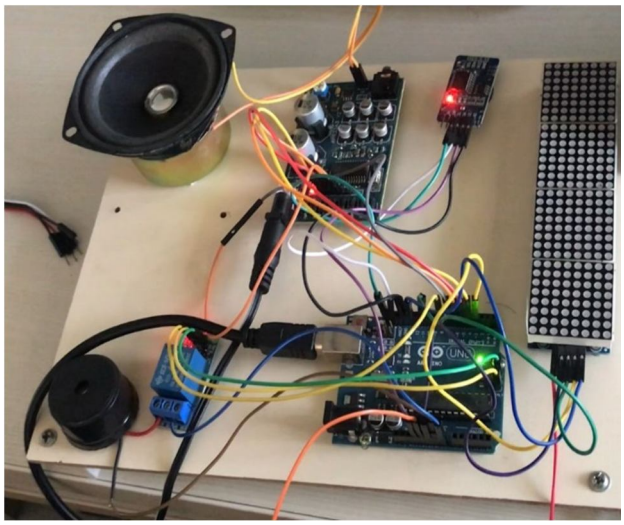


Figure-7:figure represents output when buzzer rings

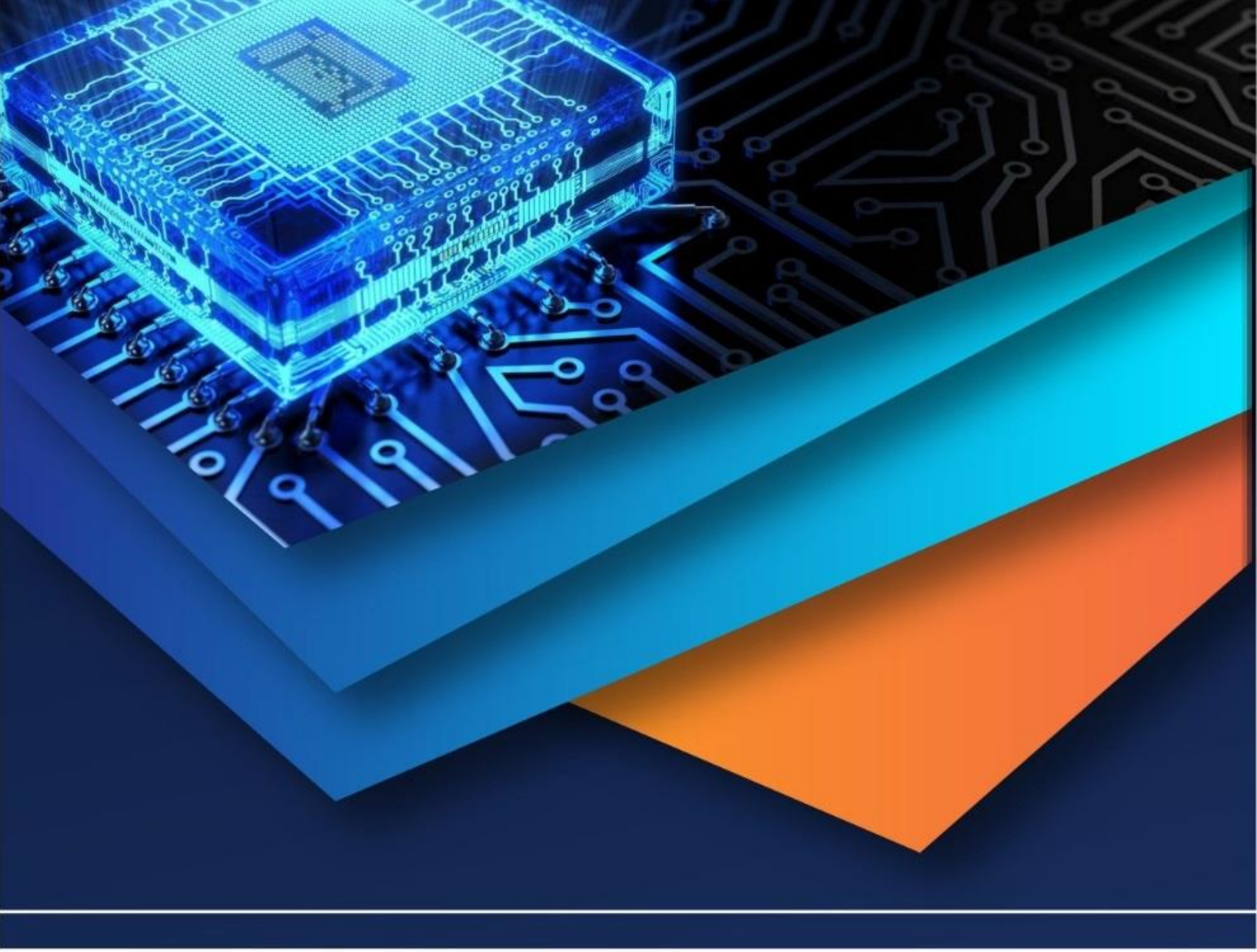
VI. CONCLUSION

In schools and colleges, installing an automated time-based bell system with a voice module improves punctuality, lessens administrative burden, and promotes effective communication. Because of the system's flexibility, different schedules can be accommodated, which eventually saves money over time. By streamlining operations and enhancing the educational experience overall, this technology improves the learning environment, involves parents and the community, and is a valuable addition to educational institutions.

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