DEPARTMENT OF HIGHER NATIONAL DIPLOMA IN INFORMATION TECHNOLOGY

SRI LANKA INSTITUTE OF ADVANCED TECHNOLOGICAL EDUCATION

(SLIATE)

INDIVIDUAL PROJECT PROPOSAL

IOT BASED AUTOMATIC BELL SYSTEM WITH MOBILE APPLICATION

SUPERVISED BY

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(DEVELOPER TRACK)

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1. INTRODUCTION

The ringing of a school bell is a signal that tells a school's students when it is time to go to class in the morning or afternoon and when it is time to change classes during the day as well as when students are dismissed from school. Typically the first bell tells the students that it is time to report to class, and the bell that occurs shortly after that means that the students are late. There may also be a warning bell between the first bell and the late bell.

In some schools it may take the form of a physical bell, usually electrically operated. In other schools it may be a tone, siren, electronic bell sound, a series of chimes, or music played over an intercom.

School bell device or system of alarm devices gives an audible, visual or other form of a signal about a condition. Bell devices include alarm clocks, distributed control systems, bells in an operation and maintenance monitoring system etc. In most schools and colleges across the world, especially in Sri Lanka, bells act as alarm devices, which are rung in accordance to the daily schedule implemented by the school authorities. The bells, in most cases, are rung manually, to indicate the start or end of periods, with the help of a person. While this helps to get the job done, but it also raises several questions. Firstly, the looming questions of accuracy remain persistent. For the purposes of maintaining the daily schedule and maintaining the bell, an individual needs to be tasked with the job, which raises the question of necessity of manpower and the increased costs, as per of his monthly wages, that comes with it.

The design of an easily configurable bell system will help to eliminate all of the above shortcomings. While such designs are currently available today, a Mobile application has been added in the system to eliminate the hassle faced by users. The bell system can be set and configured with the greatest of use through the application of a user friendly and simple interface. The system is also economically and technologically feasible, making it an affordable and long-term substitute.

The project is being developed on the open sourced Arduino Platform. The Internet of Things (IoT) function is being enabled by an Arduino. The hardware circuit provide Wi-Fi signal to communicate mobile devices and detects the supported host to set bell ringing times via mobile phone.

2. BACKGROUND AND MOTIVATION

SKH Bell is a smart, affordable device that helps you manage school bells via smartphone. It also saves your time, effort, and maintains excellent accurate timing and provides security as well. You'll receive notifications when bells are added to your school physical electric bell, and you'll be able to keep track of your school bell. In order to improve the belling system of BT/Kannankudah Maha Vidyalaya, the implementation phase is highly expected to fulfill the need of the school in a successful manner.

3. PROBLEM IN BRIEF

Once there had been a bell system in schools, which was to be rung manually using hands. As time progressed, there came an electric bell system. Then, most of the schools adapted this electric bell system. Even though this system is quite better than the conventional method, it also needs a dedicated manpower for pressing the button of the bell manually time to time.

Therefore, the introduction of a fully automated and user-friendly bell systems that can be operated through PCs or via smartphones can be of immense benefits for schools.

4. OBJECTIVES

The real-time bell system is an effective and efficient method whereby immediate new time changing and disable bells will be delivered via notification. we defined the following objectives in order to fulfill the need of the intended users.

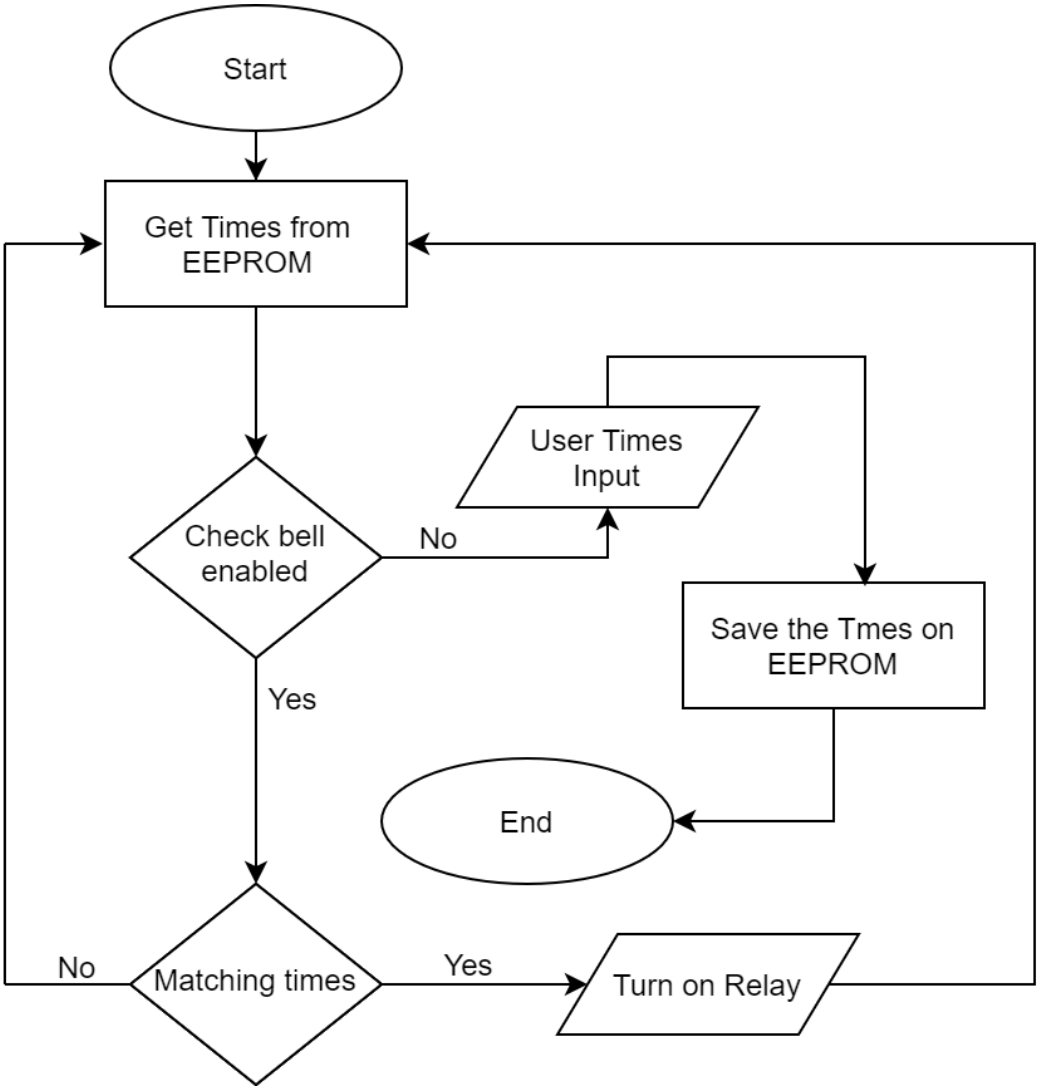
- To create a fully automated and user-friendly bell systems that can be operated through PCs or via smartphones at schools
- To maintain an effective time management through the punctual bell system
- To access every function of the bell system through smartphone effectively

5. PROPOSED SOLUTION

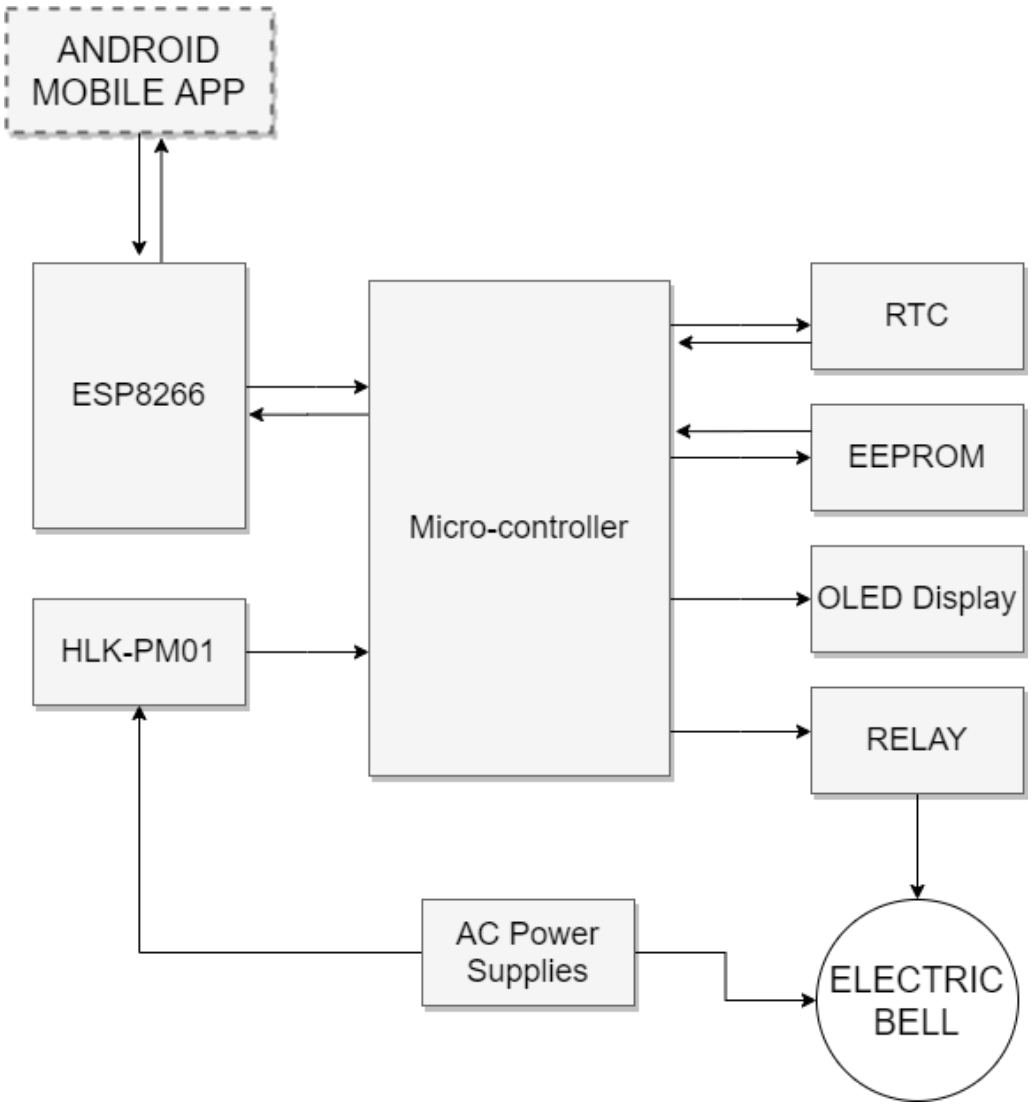
My project takes over the task of Ringing of the Bell in Schools. It replaces the Manual Switching of the Bell in the School. It has an Inbuilt Real Time Clock (DS3231) which tracks over the Real Time. When this time equals to the Bell Ringing time, then the Relay for the Bell is switched on. The Bell Ringing time can be edited at any Time, so that it can be used at Normal Class Timings as well as Exam Times.

5.1. PROJECT DIAGRAM

System flowchart



Hardware design Model



5.2. PROJECT PLAN

WEEK 1	Select project and title
WEEK 2	Finalize the project idea
WEEK 2-3	Analyzing the project requirements
WEEK 4-5	Project management
WEEK 5-7	System design
WEEK 7-13	Implementation of the system and testing
WEEK 15	Submit Final project report and do the Presentation

5.3.GANT CHART

Progress (weeks)	W1	W2	W3	W4	W5	W6	W7	W8	W9	W 10	W 11	W 12	W 13	W 14
Select project and title														
Finalize the project idea														
Analyzing the Project requirements														
project management														
System Design and Testing														
Implementation of the project														
Submit Final project report and viva														

6. RESOURCE REQUIREMENTS

To develop this system I found some several types of requirements first of all.

6.1. HARDWARE REQUIREMENTS

- This project requires common electrical tools
  - NodeMCU 12E Board
  - RTC3231 Module (Real Time Clock)
  - Relay Module (High voltage Switch)
  - OLED Display
  - Power Supply (HLK-PM01)
  - Custom PCB
  - LED's, Resisters, Diodes, BC547 Transistor

6.2. SOFTWARE REQUIREMENTS

- ARDUINO development IDE
- Android Studio IDE
- Postman
- Documentation :Microsoft Word 2013

7. REFERENCES

"*Arduino* Developers," *Arduino*. [Online]. Available: https://www.arduino.cc/. [Accessed: 20-Feb-2020].

"Android Developers," *Android Developers*. [Online]. Available: https://developer.android.com/. [Accessed: 20-Feb-2020].

"An open-source firmware based on ESP8266 wifi-soc.," *NodeMcu*. [Online]. Available: https://www.nodemcu.com/index_en.html. [Accessed: 20-Feb-2020].

"The Collaboration Platform for API Development," *Postman*. [Online]. Available: https://www.postman.com/. [Accessed: 20-Feb-2020].

"Real time clock using NodeMCU, DS3231 and SSD1306 OLED," *Simple Projects*, 27-Aug-2018. [Online]. Available: https://simple-circuit.com/nodemcu-ds3231-ssd1306-rtc/. [Accessed: 20-Feb-2020].