Smart Alarm Clock with Home Automation:A Novel Approach.

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Abstract - We all struggle with the problem of waking up in the morning and getting late for our school, college, work. So, to avoid this, we are developing a Smart alarm system which will help us wake up on time so that you are never late. The alarm clock can be set with the regular time but the user can provide an additional time which one can take to be prepared before leaving. It operates the appliance of the house if the person does not wake up. The goal is to have flexibility and Control of the alarm clock via a mobile phone app. The proposed system controls the electronics appliances like fan/AC and light onces the timer expires of the set alarm .

Index Terms: Alarm clock, IOT, Mobile App, Home Automation.

1. INTRODUCTION

The Internet of Things(IoT), is a system of interrelated objects, animals or people that are provided with unique identifiers and the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction. Fig. 1 shows the architecture of IOT and the communication between various Components. Alarm clocks have been in use for centuries because they solve a real problem ensuring we wake up on time. There are 2 type of people one who can wake up before the alarm goes off or before the time and one who need at-least 2 to 3 alarms to wake up at a particular time[2][4].
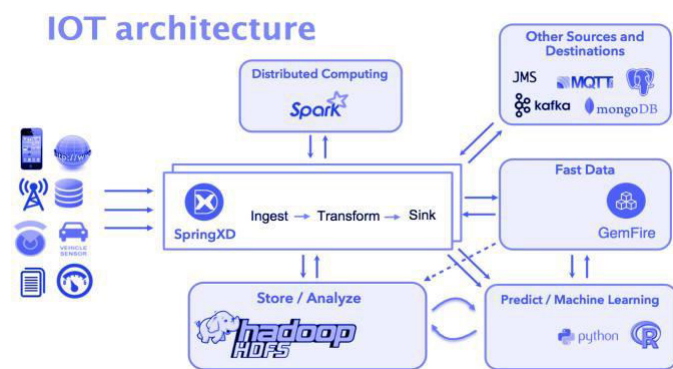

Fig- 1. Architecture of IOT

Aim of the proposed system is to provide a product that helps the person who needs two or three alarms to wake up using IOT technology. IoT expands the Internet into our everyday lives by wirelessly connecting various smart objects and will bring significant hangs in the way we live and interact with smart devices. By using this technology, we can wake the user by the selected time. This process first starts by setting an alarm through selecting flexible and adapting alarm times by tapping into the application and adjust the alarm based upon a user requirement, after setting up the alarm, the clock reaches its set time and then buzzer starts to ring, LED lights glow, and the fans stop automatically. The existing techniques only uses sound to as a medium to wake up the user. But in most cases this approach is not very effective specifically to those kinds of people who use more than one alarm to wake up.

2. ARCHITECTURE OF THE SYSTEM

IOT has been in the picture for a long time and hence making something as simple as an alarm clock into an intelligent and interactive device is also possible with the help of IOT hence making the device more effective, user friendly and advanced. To overcome some disadvantages of the existing alarm clocks, an IOT based alarm clock is introduced that connects to your room appliances and helps one to wake up and remind something important. This clock has been developed keeping waking up problems as primary concern and hence is integrated to such appliances that makes waking up easier.
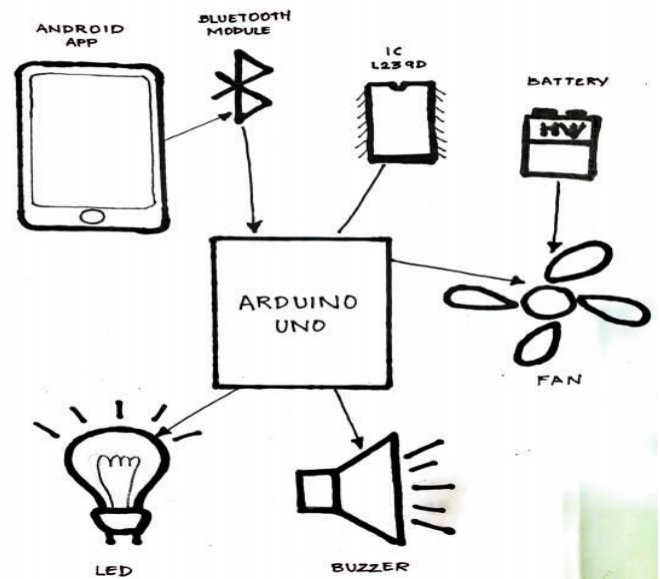

Fig- 2 Block diagram of proposed system

The proposed system consists of a micro-controller and an interface that helps the person to use this system to set alarm time. This system controls functions of the tube lights and fans of the room to which it is integrated. Once the alarm goes off, the speaker starts and the system switches on the tube lights and switches off the fans. This increases the temperature of the room which in turn creates an environment that is unsuitable for sleeping. If the person tries to snooze or switch off the system, the appliances integrated with it would stay in the same state as they are and hence makes the person to reset the system. the micro-controller controls all the room appliances, so to allow that all the room appliances like fan, light. Integrating these appliances not only makes the clock fully automated but it is also very effective to the user. The user will be given an interface through which the user can control all the function of the alarm clocks like snooze the alarm & reset the alarm. When the alarm time is set, and the

alarm starts to ring, it triggers the switches to turn on and make the fan to switch off and also increases the volume of the speaker. This type of system is very helpful to those who do not follow a schedule or routine. Not waking up at time can make the man loose big opportunities in life and can make him very much unorganized which directly adds up to his life.
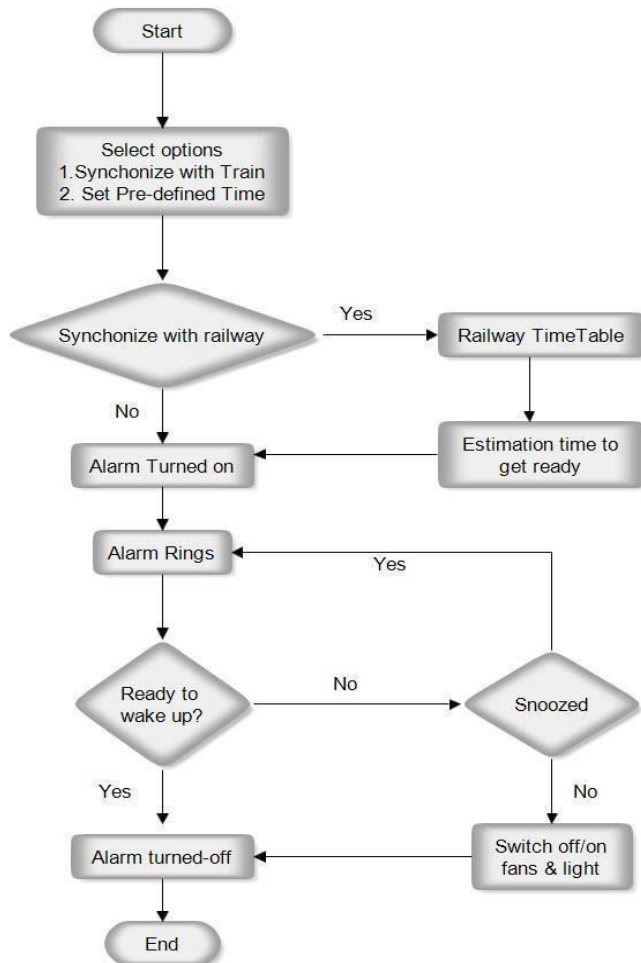

Fig 3- Flowchart for system.

The flowchart shows how the user can select the options available in the application to whether set the alarm using the synchronized time with train or any pre-defined time. Once the alarm starts beeping if the user gets up and turns it off then alarm will be off and system reset, if they fail to wake up the alarm will snooze and still the user doesn't wake up the lights will be turned on and fans will be turned off and system will reset.

Table -1: Hardware and Software used

Hardware	Software
Arduino IDE	MIT app inventor
Motor	Arduino IDE
Fan	
Bluetooth Module	

3. RESULTS AND IMPLEMENTATION

The interface consist of various functionality but before accessing any one has to be connected to the Bluetooth module to make the most of the application. User can have direct access to home appliance, so apart from the fans and lights being automated according to the alarm the user can control the appliance via the application which when turned on the appliance will turn on and If turned off the appliance will turn off as shown below.
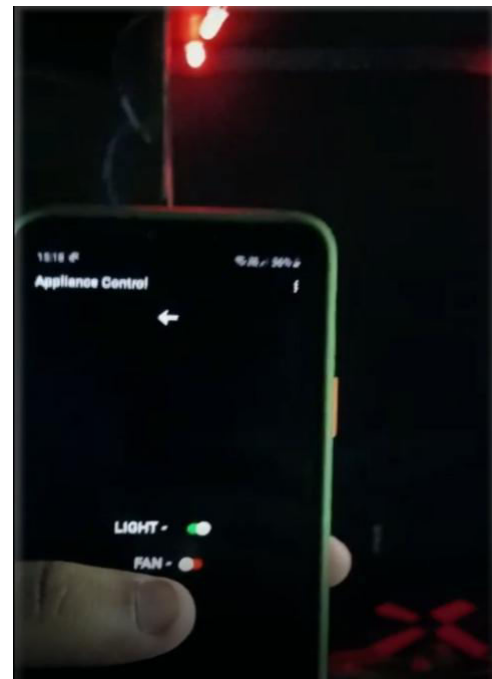

Fig 4- Appliance access

User has to set the alarm according to the train timing and the total time they will require to get ready and the user can also manage a to do list to keep a track of important things.
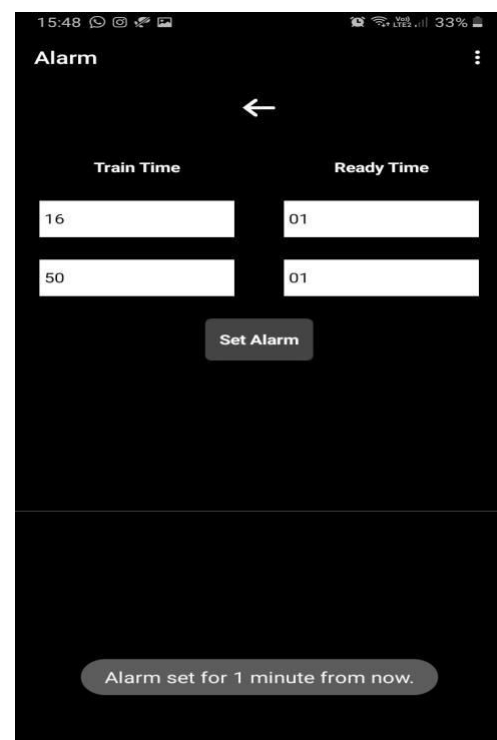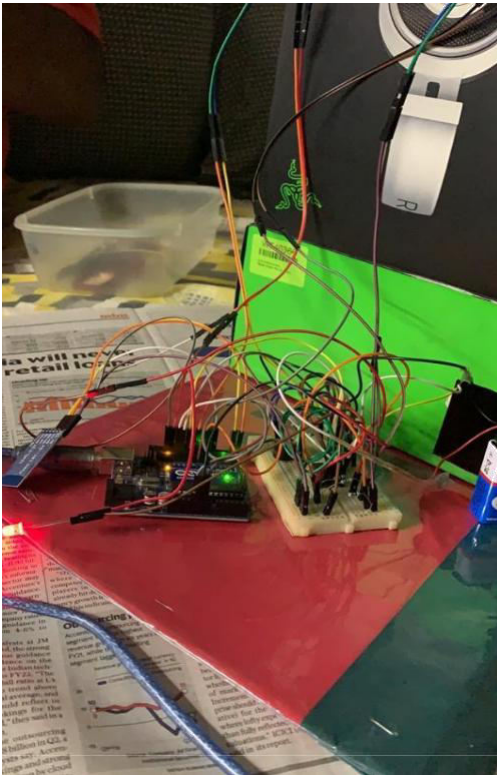

Fig 5- Alarm UI
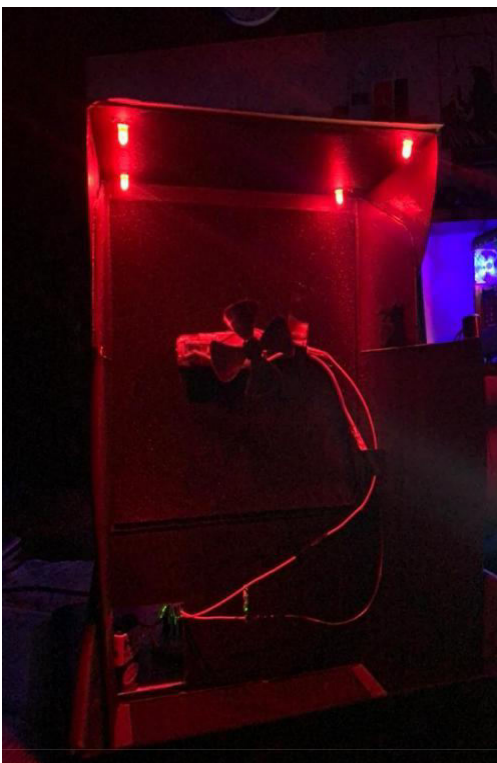
Fig 6- IOT components

Fig 7- Model of the System

Output on the Arduino will be shown as:

When Arduino receives char 2 from android app, it will turn on the fan i.e motor, When Arduino receives char 3 from android app, it will turn off the fan ie. Motor, When Arduino receives char 4 from android app, it will turn on the Lights i.e LEDs, When Arduino receives char 5 from android app, it will turn off the Lights i.e LEDs.

4.CONCLUSION

In this paper, we have presented an IOT based smart alarm clock which gives a modern twist to the alarm clock available in our phone. We have implemented software as Arduino IDE, MIT app inventor and hardware components both in the project. The application is the interaction for user to perform functionalities such as setting alarm, controlling electronics of house and create a to do list, the hardware does the part of turning on and off lights and fans according to the alarm. The future scope we are planning to implement is to have a home surveillance system in our application and an API which will directly take alarm input from the train timetable.

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