



REMOTE CONTROL ACCESSES FOR ELECTRONIC GADGETS

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ABSTRACT - In this busy life while away from home we may tend to forget to switch off the electronic appliances which cause wastage of energy. Misuse of power energy can be curtailed by automating the devices and appliances. In automation electronic appliances are controlled automatically or semi - automatically. Some of the currently available systems provide a view of the from a web application; but this can cause trouble to the user. Because user must access the web each time he/she wishes to view the status of the home appliances. In this paper a home automation system that uses IR remote, wifi and CLOUD to control electronic appliances using android app is introduced that is easy to use over the traditional method of the switch. Therefore, the motivation behind the development of this system is to let people know about these technologies, and make the system as simple as possible for an ordinary person to understand. The result of this research is the implementation of automation system which involves control and automation of electronic appliances through mobile application from remote locations.

KEYWORDS – JSP (Java Servlet Pages), XML (Extensible Markup Language), Arduino UNO, Node MCU Relay.

I. INTRODUCTION

Automation and android phone plays a major role to live smartly and securely. Automation is a remotely controllable network to which lights, appliances, electrical outlets heating and cooling systems are connected. Today, automation system requires to control the AC appliances and get the current status back of appliances i.e. ON/OFF wirelessly on an android application over long distance. automation is also known as demotics. It involves the control and automation of lighting, heating, ventilation, air conditioning, security. It also includes control and automation of appliances such as lights fans. Automation is a modern technology that transforms living place to an extent that it can perform different sets of tasks automatically. Technology is constantly upgrading its versatility by integrating modernized features to fulfil the increasing demands of people. Main purpose of automation system is to save electricity. Smart automation facilitates user comfortable living and energy management features as well as added benefits for disabled individuals. automation systems have varying degree of intelligence and automation. It can range from simple remote control of lighting to complex microcontroller based networks. The main characteristic of Automation system is remote monitoring and access of home appliances and systems. Use of Automation systems causes home appliances to communicate in an integrated manner. It helps to obtain several factors such as convenience, energy efficiency and safety benefits. Most of the present systems are not reasonable for many people due to their high costs and exhausting maintenance. Some systems provide solutions that are not very useful for household applications.

In the project Wi-Fi module, Arduino Uno and node MCU are used for automation. Automation system is use of information technologies and control system to reduce the human labor. The rapid growth of technologies influences us to use smartphones to remotely control the home appliances, to remote access electronic devices, to build a mobile app to control devices remotely.

II. METHODOLOGY

Automation system uses Arduino Uno, Wi-Fi, Relay and Android App to control appliances. Electrical appliances are controlled with clicks on Android application. Instructions are sent to Arduino through CLOUD module, Wi-Fi module we will be developing a mobile application to control blue tube light, fan and projectors in real time. These devices will be controlled by cloud. Cloud control is used when a user wants to access or control the appliance from a far place remotely module and user module.

A. Arduino UNO Module

The Arduino Uno is an Atmega328 based microcontroller board. This microcontroller board has 14 digital I/O pins out of which 8 pins we have used for interfacing home appliances. It also has a USB connection, power jack and a reset button. It is used to decode the signals sent by CLOUD and accordingly send the control signal to relay module. CLOUD module NodeMCU are serially interfaced with Arduino. IR receiver TSOP 1738 is interfaced to digital input pin of Arduino Uno

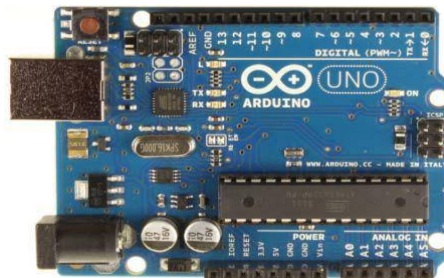


Figure 1: Arduino uno module

B. Relay module

A relay module is used to turn on or turn off appliances using voltage and/or current much more than Arduino could handle. This is also used for providing isolation between the low voltage circuit on Arduino side and the high voltage circuit side controlling home appliances. Relay module is activated by using external 5V power supply, which in turn, controls electrical appliances like fans, lights, ovens etc. In this project 8-channel DC 5V relay module is used. It is equipped with high current relay, AC250V 10A and DC 30V 10 A. In it each relay needs 15-20mA driver current.



Figure 2: Relay module

C. NODE MCU Module

Node MCU is an open source Lua based firmware for the ESP8266 WiFi SOC from Espressif which acts as a wifi connecting device to connect for the external devices which uses an on-module flash-based SPIFFS file system. Node MCU is implemented in C and is layered on the Espressif NON-OS SDK. The firmware was initially developed as a companion project to the popular ESP8266-based Node MCU development modules, but the project is now community-supported, and the firmware can now be run on any ESP module

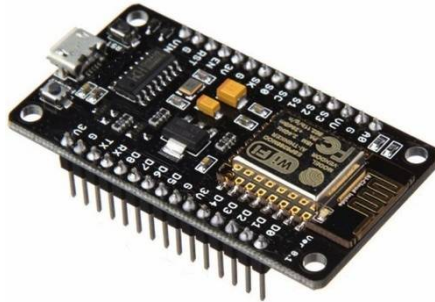


Figure 3: Node MCU module

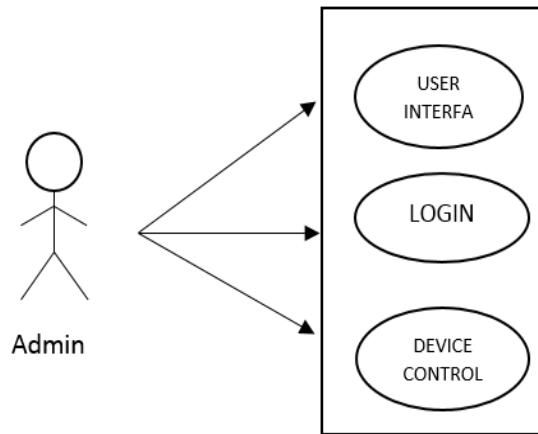


Figure 4: Representing the usecase flow diagram

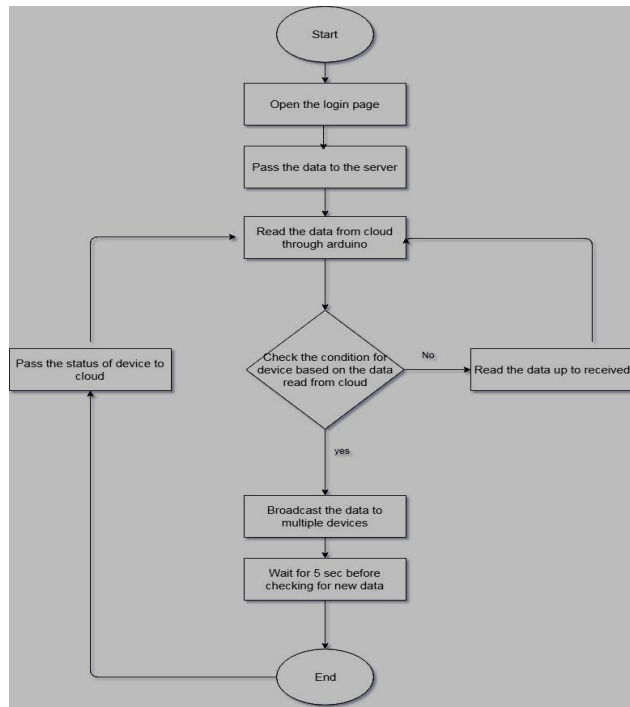


Figure 5: Representing the Data flow diagram

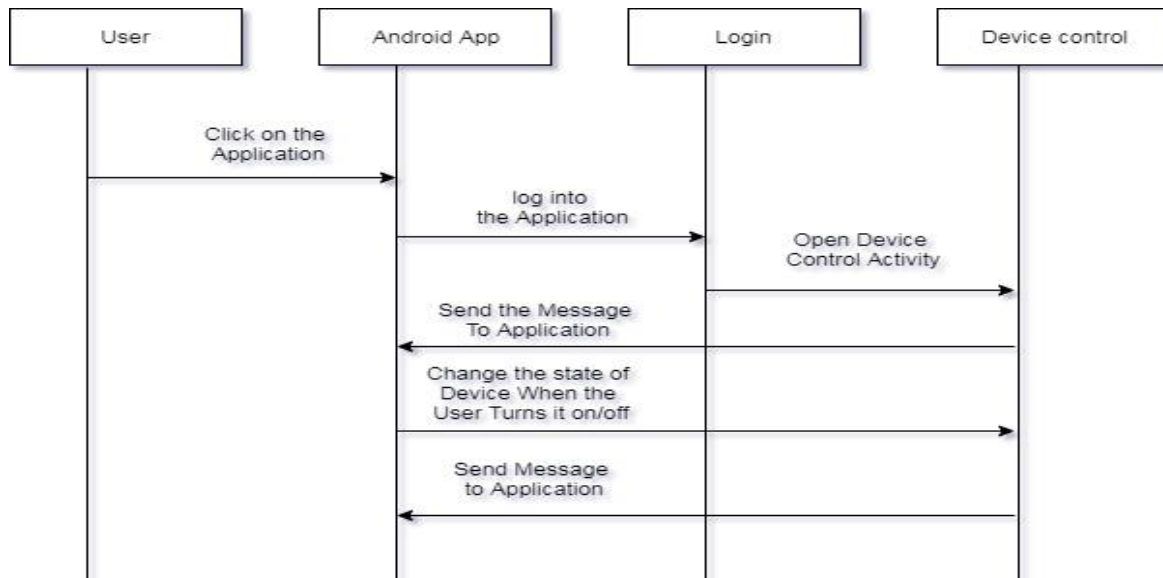


Figure6 : Representing the sequence flow diagram

III. SYSTEM ARCHITECTURE

In this section we describe how the connection take place between three modules this mainly composed of

- i) Arduino module which is connected to relay module and admin can directly be in contact with teacher
- ii) The relay module is connected to electronic appliances and web-based app.
- iii) The Node mcu module is connected to application.

The figure 7 represents the system architecture of the connected modules, where it represents the power supply will enable the activation of the entire system and the activation of Arduino board happens, the connected node mcu provides the information of the data which is in turn connected with the relay modules through an application .

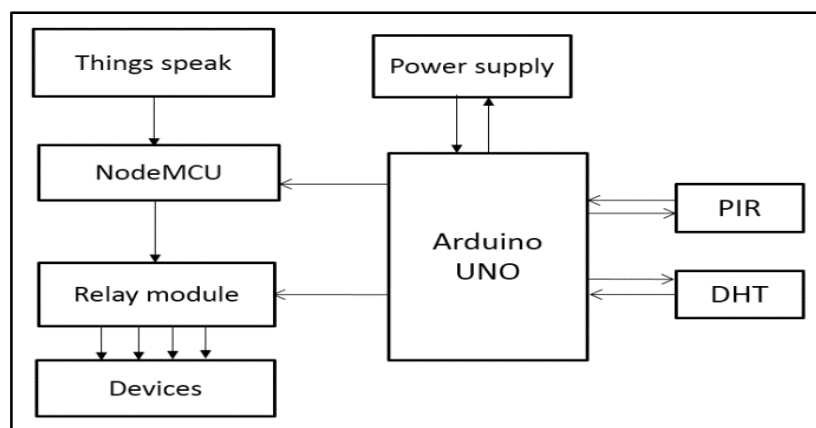


Figure 7: System architecture

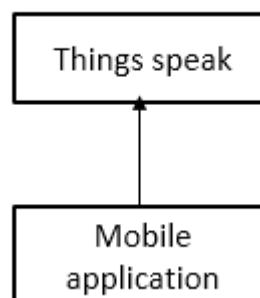


Figure 8: Interaction with application

The relays that are connected to the electronic appliances will provide the virtual information to the node mcu through the node mcu the data is send to the application and the control operation is done by the user through and application and the figure 8 which provides the information of the activities that are happening between the application and the electronic appliances.

IV. IMPLEMENTATION

Implementation is one of the most important stage of system development life cycle. The stage of implementation includes converting the design phase into a real system using various programming languages and scripting languages. The idea of implementation and the idea of the system will be deigned in the designed phase. We will be implementing the flow of each module into a real system. The real systems are to be implemented in this phase and will be tested for validation in the next phase after successful implementation. The systemsare been implemented such a way that they are flexible for future developments and adding different functionalities for future enhancement. There are two types of computer languages are used one is programming language in our case will be java, and the other is scripting language in our case we use XML/HTML along with JSP pages, where JSP allows the java code to be inserted into HTML/XML.

The pseudo code for application is as follows:

1. START LOGIN
2. Enter wifi Id and password
3. Id and password are verified with the database.
4. IF (id, password valid)
 - i. login into the HOME page
 1. reset
 2. If(on)
Turn off the appliances
 3. viewing the events.
 - ii. Set the threshold limit for lights
 - iii. Set the limits for temperature
 - iv. If temperature limits exceeds turn on the fan
5. Add a user by giving wifi Id
 - i. IF (id exists)
 - ii. Provide the access to other devices
 - iii. ELSE
 - iv. url not matching
6. Display url not identified
7. END

The pseudo code for Router is given as follows:

1. RUN THE PROGRAM
2. Connect the router using home wifi and password.
 - The new IP is generated.
 - Share the IP for the trusted user for operation
3. IF (IP matches)
 - Connect to the users
4. Else
 - Invalid IP
5. END CONNECTION

V. RESULTS

Automation systems have varying degree of intelligence and automation. It can range from simple remote control of lightingto complex microcontroller based networks. The main characteristic of automation system is remote monitoring and access of appliances and systems. Use of automation systems causes home appliances to communicate in an integrated manner. It helps to obtain several factors such as convenience, energy efficiency and safety benefits. Some of the snapshots for the working of the module are shown in the following figures

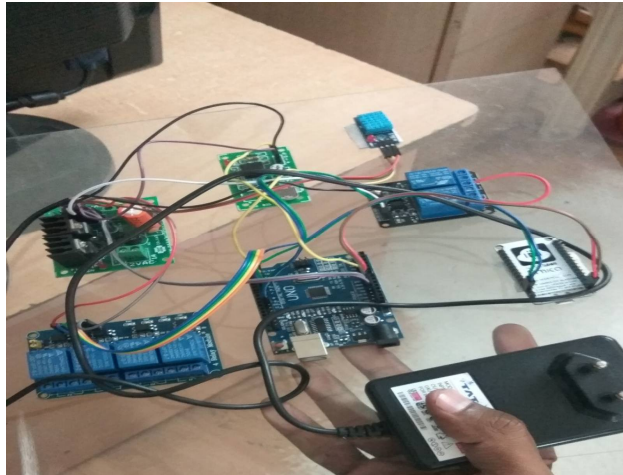


Figure 10 :Model representation.

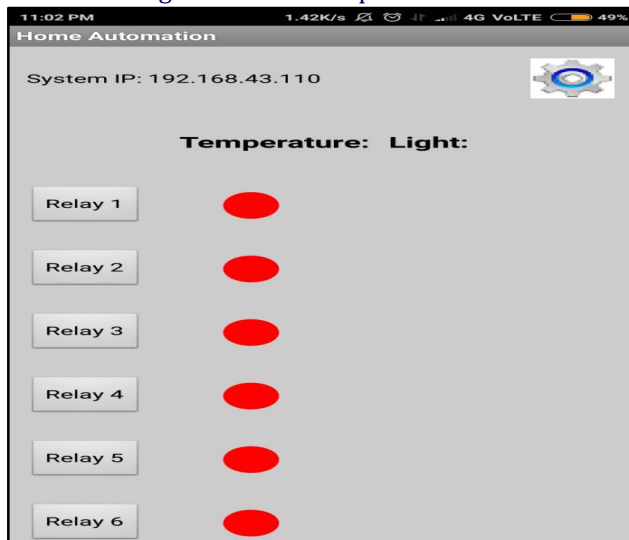


Figure 9: Home page

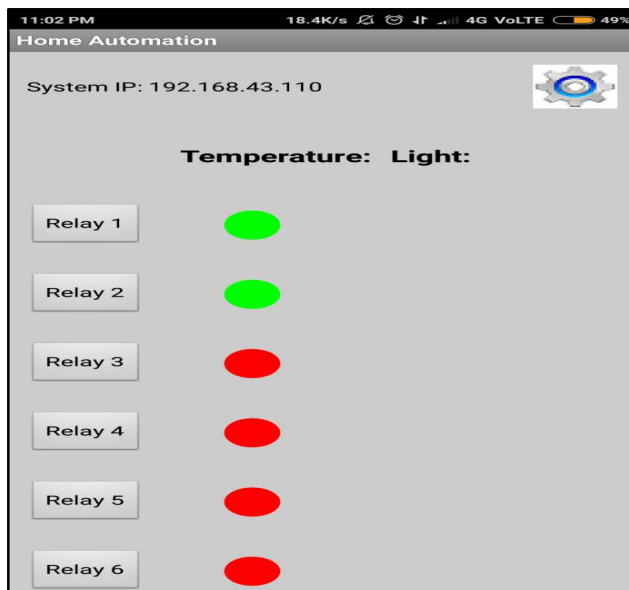


Figure 11:Display of an appliances which are "ON"

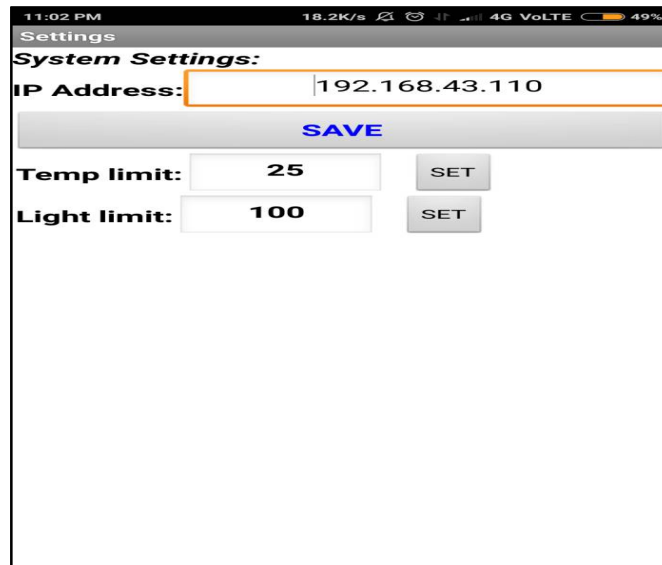


Figure 12: Threshold limits setting

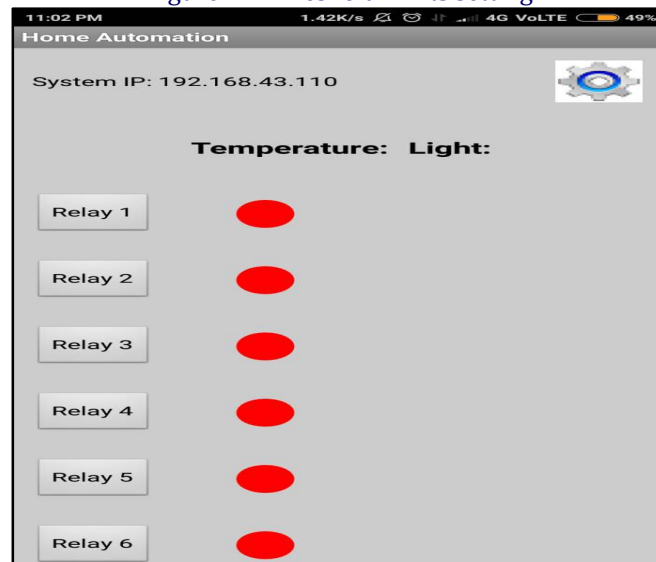


Figure 13: Reset the Application

VI. CONCLUSION

Automation market is very auspicious sector which is developing rapidly. It requires extensive range of developments that can be made in the idea of smart Appliances. Modelling and execution of Automation system using Wi-fi module, Arduino Uno CLOUD through android application has been discussed in this paper. The proposed system is practical, economical and simple. As the range of CLOUD is worldwide people can use the Automation system from any part of the world. The key advantage of system is if control circuit fails then manual switching option of traditional system method is available.

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