IoT BASED HOME APPLIANCES CONTROL

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Abstract— **In the IoT, Things are expected to become active participants where they are able to interact and communicate among themselves by exchanging data and information sensed about the environment. For that they react autonomously to the real world events and provide services with or without direct human intervention. In this paper we use IoT for energy efficient Environment conditions are sensing and controlling in Home. In this paper we will see how to provide fully smart environment condition monitoring by various sensors (Temperature, Humidity, Light and Level) for providing necessary data to automatically adjust the comfort leveling homes by optimizes use of energy. We also use prediction here for automatically detection and resolution of any problem in the devices. For that we are using Naive Bayes classifier algorithm for data mining. It will send email or SMS to required technician for service and it will also notify the owner. This gives a huge advantage on the smart home systems using IoT.**

Keywords: **Internet of Things, Controller, Home Automation, Arduino, Mobile Application**

I. INTRODUCTION

IoT means internet of things. It is one of the promising technologies which can be used for connecting, controlling and managing intelligent objects which are connected to Internet through an IP address. The user here will move directly with system through a web-based interface over the web, whereas home appliances like lights, fan and door lock are remotely controlled through easy website. The communication with server allows the user to select the appropriate device. By this we provide a climbable and price effective Home Automation system.

Today, technology has become an integrated part of people's lives. The Internet might even be utilized in home automation that offers several decisions from economical use of energy to additional console, protection and safety. Even over great distances the user can monitor and manage their home gate, various appliances and turn on/off the T.V without any human intervention. Despite these advantages, home automation has however received extensive approval and an attention owing to its high significance and complexness [2]. This paper will describe an approach in which we implement a controlling and continuous monitoring system to control various home appliances with Android smart phone.

II. INTERNET OF THINGS

The Internet of things (IoTs) can be defined as connecting the various types of objects like smart phones, personal computer and Tablets to internet, which brings in very newfangled type of communication between things and people and also between things.

With the introduction of IoTs, the research and development of home automation are becoming popular in the recent days. Many of the devices are controlled and monitored for helps the human being. Additionally various wireless technologies help in connecting from remote places to improve the intelligence of home environment. An advanced network of IoT is being formed when a human being is in need of connecting with other things. IoTs technology is used to come in with innovative idea and great growth for smart homes to improve the living standards of life.

III. MOTIVATION

In early days people were using bluetooth technologies for controlling the home appliances, but they have to be in a certain range for controlling the appliances remotely. The IoT helps people to control the appliances remotely from anywhere around the world by using the smart phones, only they have to connected with the internet. IoT overcomes the issue of range which is faced in bluetooth technology. The system will capable of controlling and automating the home appliances through an easy manageable web interface.

IV. PROBLEM STATEMENT

Use of IoT technology to reduce energy consumption at home is one of the challenging task for the smart home engineer. It becomes more hectic in his/her busy life if user fails to turn off the home appliances, which may create the problem of loss of electricity. To achieve effective solution to this problem one such home automation system is required which allows the user to manage home appliances remotely without their physical presence. Also there are problems with home automation as it faces the main problems of costing, manageability, security. In this paper we introduced a smart phone application that gives the pop-up messages to the user in our defined case, so user can able to switch them off. This application has a great flexibility as it is using IoT technology.

V. EXISTING SYSTEM

The IOT(Internet of Things) is used for the connecting everyday devices like smart phones, TV sensor and actuator to the Internet where the devices are connecting to each other and communicating between things and people.[8]By using IoT, things to get connected anyplace with anything, anytime and anyone using Internet and network connecting any services. IoT is the revolution of the Internet.[13] With the IoT technology require for connecting household items with benefits like cheaper in cost with almost every posing day, one does not have to look too far in the future to imagine a smart home that is connected to the network and able to ease the life of the inhabitants. IoT developing technology will provide people personal and commercial goods with unimaginable work. As much as home automation still seems to be part of the future, there are

actually a number of applications that exist in the present that allow for varying degrees of home connectivity. A home automation system allows user to control electric the appliance. Various existing well establish home automation system based on wired communication. [13]But the problem can be occurred during the physical construction of the building, for already existing building the cost goes very high for sorting out this problem wireless system. Example for wireless technology such as WI-FI cloud networks in the recent past. Now a day's peoples are using it in every day and everywhere.

VI. PROPOSED SOLUTION

Here, this paper is contributory of knowledge to the development and implementation of home automation systems in Nigeria using low cost, locally available components like microcontroller, free voice dial service (popularly referred to as 'flashing') and very cheap short message service (SMS) text.
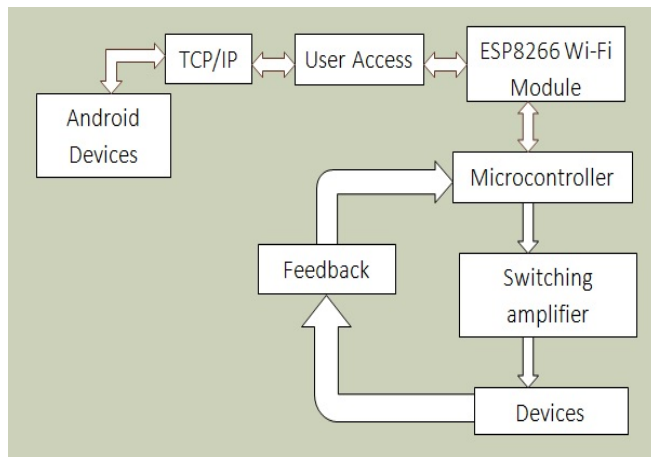

Fig 1:Home Appliances Control Diagram

A. Device:

Device consists of microcontroller or any controlling unit which can communicate with esp8266 using UART (rx/tx) communication as well as control home appliance.

B. ESP8266:

The ESP8266 is a low cost Serial-to-Wi-Fi module that interfaces nicely to any microcontroller.

C. Serial Configuration:

Communicating with Wi-Fi Module via internet Using TCP/IP Protocol and Using Static ip for module.

D. User access:

User can access the Module Via internet by Authenticate Username and password as well as can change Ip Address and get full control.

E. Web Software/Android app:

User can access their home appliance using android app or Web software using internet provided that Wi-Fi module should be connected through internet. Software or android app sends command using tcp /ip packets over internet.

F. Level Shifter:

Level shifters are used in multi web design because in multi web design different blocks are working on different voltages. So when a signal passes from one voltage domain to another voltage domain the level shifter is needed particularly when a signal passes from low voltage domain to high voltage domain. The level shifter will convert one voltage level from to another voltage.

G. Power Supply:

A power supply is a hardware component that supplies power to an electrical device. It receives power from an electrical outlet and converts the current from AC (alternating current) to DC (direct current), which is what the computer requires. It also regulates the voltage to an adequate amount, which allows the computer to run smoothly without overheating. The power supply an integral part of any computer and must function correctly for the rest of the components to work.

H. Relay:

Relay is a small electrical switch consisting of an electromagnet (coil), a switch and a spring, that opens and closes under the control of another electrical circuit. The spring holds the switch in one position, until a current is passed through the coil; the coil generates a magnetic field which moves the switch. Because the relay is able to control an output circuit of higher power than the input circuit, it is often used to automatically switch large electrical power devices.

I. Home Appliance:

The home appliances must be connected to the main power supply at all times. This is a precondition for the system. The various aspects of the system which can be controlled are:

a. The appliances status (ON/OFF)

b. The output power of the appliance

c. The time for which the appliance is running

VII.IMPLEMENTATION DETAILS

In this paper, the concept of home automation using IoT is realised using 10w cost micro-controller based Arduino board and an Android mobile phone. Arduino is a open source platform that can be used for prototyping any hardware and software. Arduino can be programmed to receive keyboard input or sensor data and control various electrical appliances connected to output peripherals. Since mobile phone is a wire1ess communication device, connectivity between Arduino and smart phone is established using IoT, one of the short range wireless communication technologies that can be used for communication in an indoor environment.
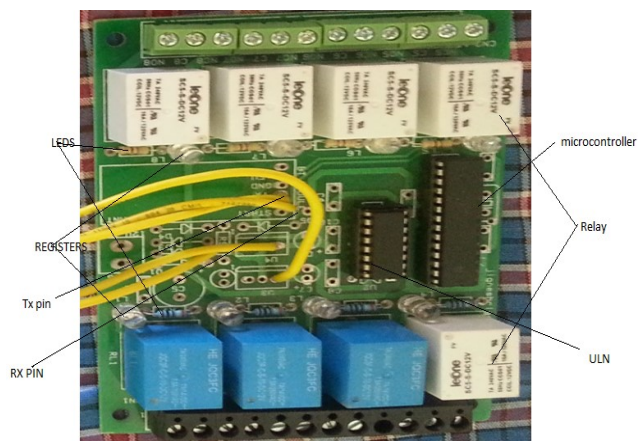
Fig 2:Home Automation Circuit Board

Here fig.2 consist Home Automation circuit board. There are many components attech with this board. this is the main circuit of home automation.Atmegha 8 microcontroller through we control whole system.here Eight relay control eight devices.
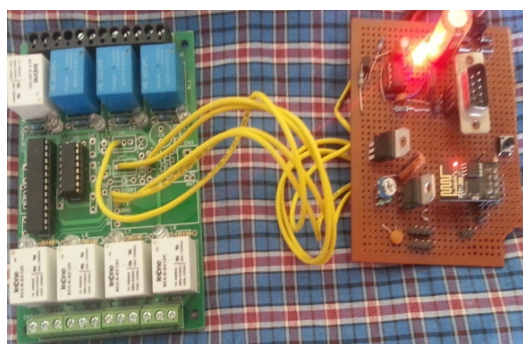

Fig 3:Implementation Circuit Board

A Power supply module is connect with home automation circuit board. In power supply board ESP8266 WI-FI module is configure. This WI-FI module program loaded by android studio software.here arduino board is also used for loading the home automation circuit. Fig3. Through we easily know pawer supply module serially communicate with automation circuit. This project is operate by cell phone, laptop, tablets etc. but here we use mobile application.mobile aplication through I can easily device on or off due to the using of IoT. Here internet is very important. In fig.4 we can show automation circuit and mobile aplication wireless connection.
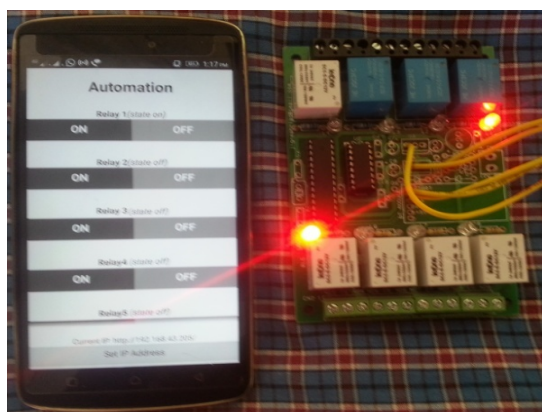

Fig 4: Working of automation circuit

Here first ESP8266 WI-FI module is connect with mobile. Mobile hostpot through module is connect. After then here I can use automation application this app. Is open and set this Ip address. Ip address will set then dives is active. Automation board eight leds are configure when I touch relay 1 ON then automation board one led is blink and I touch OFF it is not blink.same way all leds control by mobile application. The relays are control all devices.microcontroller is controlling whole divece. This automation board configure with devices and we easily ON or OFF device.

After getting logged into home automation system by means of user name and password, the various rooms are visible with various devices. We can view status of all lights and fans in each of the room whether they are turned ON/OFF. The same can be implemented in a mobile\home for continuous monitoring. We can view all the rooms in the home with various devices, where we can select the rooms which we want to control.

VIII. RESULT

The system allows the user to control appliances and lights in their home from a smart phones and PC from anywhere in the world through an internet connection. It also allows the user to control their units within their home from a wireless remote. In these papers we proposed a Novel technique that will give us best result. Which include prediction by providing Notifications to the user if problem occurs in any device. First of all we collect different sensor values and analyse it with the help of microcontroller. We can monitor and control it with pc or any android device connected to it. If problem found in any device we notify owner and the related technician about the problem. We use Naive Bayes classifier algorithm for data mining which is a simple probabilistic classifier based on applying Baye's theorem with strong (naive) independence assumptions.

IX. CONCLUSION FUTURE WORK

A smart home system integrates electrical devices in house with each other. The techniques which are going to use in home automation include those in building automation as well as the control of domestic activities, such as TV, fan, electric tubes, refrigerator and washing machine. After studying and understanding literature survey and other existing works, we proposed a novel technique that will gives us better understanding of the environmental conditions in home. Our system not only just monitors environmental conditions but it acts according to inhabitant requirement. We also provide notification to the user about any error occurs in the devices and send mail or SMS to the service provider about the problem. In this paper we are planning to eliminate most of the human interaction by providing intelligent system. Development of such actually manage to make low cost, flexible smart homes to adjust its environmental conditions and resolved its errors with energy saving.

X. FUTURE WORK

In future our system we have SMS and email notifications to the user. This system can be expanded to include various other options which could include home security feature such as open door and motion detection, energy monitoring.

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