IOT-Based Home Automation Appliances

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***Abstract*--Internet of Things(IoT) is a next generation of Internet. The IoT providing an easy way of life with comforts to human being by managing and interacting remotely control of home appliances. The Home Automation System is a new technology for control remotely by IoT technology infrastructure(sensors, communication devices, microcontroller, without interacting of human being.**

Keywords–IoT, Home automation system, home appliances, Internet, Microcontroller, NodeMCU.

I. INTRODUCTION

Home automation refers to the automatic way to control of house hold appliances, there are various systems used for home automation that is based on different microcontrollers and take different parameters to monitor and control the home appliances. The system providing facility to control of home appliances by IoT sensor and other communication devices efficiently. We can control home appliances by mobile device or laptops or over web anywhere in the world. The system is used for controlling various tube lights, fans, home appliances, electrical motors, air conditioner, air heating systems etc are easily controlled by web or internet enabled devices, All these types of systems becoming more popular due to its less cost of implementation and provides flexible functionality that can be easily configurable by every one according to their need that's why all the IoT system are in great demand and have a lot of value because helping peoples like the people having disabilities, as they can't walk more much then this system is very useful to them and also for the patient or for the old aged person that remains mostly on the bed or also beneficial for the persons that live alone in their houses.[3,4].

In this system architecture consists of proposed system model which connect, communication and co-ordination of various communication devices through Internet for takes important of home automation system. This proposed system contains two Arduino. The Arduino (ATmega Micro Controller Unit) is a open source contains software and hardware that built-up very less expensive system designed on chip known as ESP8266.

II. LITERATURE REVIEW

[1]. "Smart Energy Efficient Home Automation System using IOT", by Satyendra K. Vishwakarma, Prashant Upadhyaya, Babita Kumari, Arun Kumar Mishra**.**

This paper presents a step-by-step procedure of a smart home automation controller. It uses IOT to convert home appliances to smart and intelligent devices, with the help of design control. An energy efficient system is designed that accesses the smart home remotely using IOT connectivity. The proposed system mainly requires, Arduino as the microcontroller unit, IFTTT to interpret voice commands, Adafruit a library that supports MQTT acts as an MQTT broker and Arduino IDE to code the microcontroller. This multimodal system uses Google Assistant along with a web based application to control the smart home. The smart home is implemented with main controller unit that is connected with the 24-hour available Wi-Fi network. To ensure, that the Wi-Fi connection do not turn off, the main controller is programmed to establish automatic connection with the available network and connected to the auto power backup.

[2]. "A Low Cost Home Automation System Using Wi-Fi based Wireless Sensor Network Incorporating internet of Things", by Vikram. N, Harish K.S, Nihaal M.S, Raksha Umesh, Shetty Aashik Ashok Kumar.

This paper illustrates a methodology to provide a low cost Home Automation System (HAS) using Wireless Fidelity (Wi-Fi).This crystallizes the concept of internetworking of smart devices. A WiFi based Wireless Sensor Network (WSN) is designed for the purpose of monitoring and controlling environmental, safety and electrical parameters of a smart interconnected home. The different 11 | P a g e sections of the HAS are; temperature and humidity sensor, gas leakage warning system, fire alarm system, burglar alarm system, rain sensing, switching and regulation of load & voltage and current sensing. The primary requirement of HAS to monitor and control of devices is accomplished using a Smartphone application. The application is developed using Android Studio based on JAVA platform and User Interface of those are exemplified. The primary focus of the paper is to develop a solution cost effective flexible in control of devices and implementing a wide range of sensors to to capture various parameters.

[3]. Enhance Smart Home Automation System based on Internet of Things", by Tushar Churasia and Prashant Kumar Jain.

This paper proposes a system that develops a model to reduce the computation overhead in existing smart home solutions that uses various encryption technologies like AES, ECHD, hybrid, etc. these solutions use intermediate gateway for connecting various sensor devices. The proposed model provides a method for automation with sensor based learning. The system uses temperature sensor for development but other sensors can also be used as per requirement. These smart home devices with sensors can configure themselves autonomously

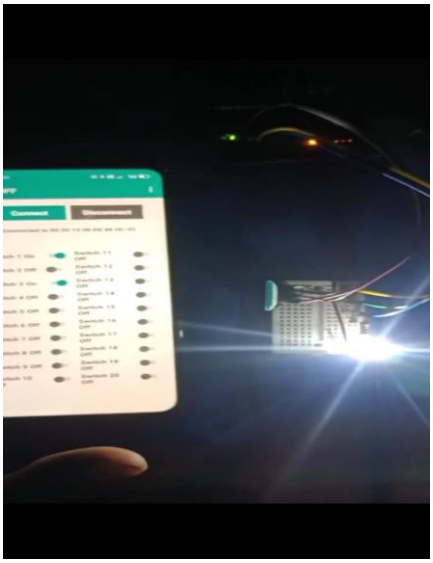
and can operate without human intervention. This work minimizes encryption decryption and focuses on authentication and automation of smart home devices with learning. The system bypasses local gateway mentioned in existing system to provide better security for smart home devices and sensor data and save computation overhead. The real time broker cloud is directly connected with smart home and manages all incoming and outgoing request between users and devices. The main purpose to use real time broker cloud is save time of cryptographic operations.

III.PROBLEM STATEMENT

Nowadays, people with the hectic daily life routine sometimes makes them forgetful to switch off the devices at home. As a human being we can't run from the clumsiness attitude plus with our packed daily routine life that sometimes makes ourself such in hurry situation that sometimes makes us forgot to switch off the lamps. It will causes the electricity bill rose sharply. Besides, it is one of the electricity wastage that will lead the earth to became an unhealthy ones. Besides, the elderly and the handicapped user faced problem to manually access control of light and fan instead of automation process.

IV.IMPLEMENTATION

A.Methodoloy



- A smartphone which should have the android app install in it.
- Bluetooth Receiver module-Our project will be connected to the smart phone using web technology.
- Controller or the main processing circuit- In this project, Arduino Uno is a main controlling/processing unit. Also, this project can be develop using PIC18F4550,AVR ATmega32.
- Relays to control devices-We have used 12V single push single throw relays.
- Output devices- For the demo purpose we connected DC devices to relay(12V DC bulbs).

B.Project Components

1.Arduino Microcontroller

The Arduino Uno is an open-source microcontroller board based on the Microchip ATmega328P microcontroller and developed by Arduino.cc. The board is equipped with sets of digital and analog input/output (I/O) pins that may be interfaced to various expansion boards (shields) and other circuits. The board has 14 digital I/O pins (six capable of PWM output), 6 analog I/O pins, and is programmable with the Arduino IDE (Integrated Development Environment), via a type B USB cable. It can be powered by the USB cable or by an external 9-volt battery, though it accepts voltages between 7 and 20 volts. It is similar to the Arduino Nano and Leonardo.

2.Bluetooth Module

i. HC-05 is a Bluetooth device use for wireless communication with bluetooth enables device (like smartphone).It communicate with microcontroller using serial communication (USART)..

ii. Default setting of HC-05 bluetooth module can be changr using certain at commands.

iii. As HC-05 bluetooth module has 3.3 level for Rx/Tx and microcontroller Decaet.

iv. Volt level , so there is no need shift the transmit voltage level from microcontroller to RX of HC-05 module.

3.Bread Board

Breadboard, solderless breadboard, or protoboard is a construction base used to build semipermanent prototypes of electronic circuits. Unlike a perfboard or stripboard, breadboards do not require soldering or destruction of tracks and are hence reusable. For this reason, breadboards are also popular with students and in technological education.

V.CONCLUSION

This paper proposes a low cost, secure, ubiquitously accessible, auto-configurable, remotely controlled solution. Hence we can conclude that the required goals and objectives of home automation system have been achieved. The system design and architecture were discussed, and prototype presents the basic level of home appliance control and remote monitoring has been implemented. Finally, the proposed system is better from the scalability and flexibility point of view than the commercially available home automation systems.

VI.FUTURE SCOPE

Using this system as framework, the system can be expanded to include various other options which could include home security feature like capturing the photo of a person moving around the house and storing it onto the cloud. This will reduce the data storage than using the CCTV camera which will record all the time and stores it. The system can be expanded for energy monitoring, or weather stations. This kind of a system with respective changes can be implemented in the hospitals for disable people or in industries where human invasion is impossible or dangerous, and it can also be implemented for environmental monitoring.

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