

IOT Based Smart Home Automation and Security System

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Abstract—Automation the process of controlling or operating various Equipment, machine Industrial process and other applications using various Control systems and also with less or no human intervention is framed as automation. Home Automation in the process of controlling home appliances automatically using various control Systems Techniques. The electrical and electronics appliance such as fan, light, alarm echo can be controlled using various controlling techniques. The project proposes an efficient implementation for IOT (Internet of Things) used for monitoring and controlling the home appliances via World Wide Web. Home automation system uses the portable devices as a user interface. They can communicate with home automation network through an Internet gateway, by means of low power communication protocols like, Wi-Fi etc. This project aims at controlling home appliances via Smartphone using Wi-Fi as communication protocol and BLYNK as server system. he user here will move directly with the system through a web-based interface over the web, whereas home appliances like lights, fan and door lock are remotely controlled through easy website. An extra feature that enhances the facet of protection from fireplace accidents is its capability of sleuthing the smoke in order that within the event of any fireplace, associates an alerting message and an image is sent to Smartphone. Communicates with the corresponding relays.

Index Terms— IR, DHT, TSOP, IOT, MCU

I. INTRODUCTION

The Internet of Things (IoT) describes the network of physical objects “things”—that are embedded with sensors, software, and other technologies for the purpose of connecting and exchanging data with other devices and systems over the internet. These devices range from ordinary household objects to sophisticated industrial tools. With more than 7 billion connected IoT devices today, experts are expecting

this number to grow to 10 billion by 2020 and 22 billion by 2025. Over the past few years, IoT has become one of the most important technologies of the 21st century. Now that we can connect everyday objects—kitchen appliances, cars, thermostats, baby monitors—to the internet via embedded devices, seamless communication is possible between people, processes, and things. By means of low-cost computing, the cloud, big data, analytics, and mobile technologies, physical things can share and collect data with minimal human intervention. In this hyper connected world, digital systems can record, monitor, and adjust each interaction between connected things. The physical world meets the digital world—and they cooperate. The internet of things helps people live and work smarter, as well as gain complete control over their lives. In addition to offering smart devices to automate homes, IoT is essential to business. IoT provides businesses with a real-time look into how their systems really work, delivering insights into everything from the performance of machines to supply chain and logistics operations. IoT enables companies to automate processes and reduce labor costs. It also cuts down on waste and improves service delivery, making it less expensive to manufacture and deliver goods, as well as offering transparency into customer transaction. As such, IoT is one of the most important technologies of everyday life, and it will continue to pick up steam as more businesses realize the potential of connected devices to keep them competitive. In enterprise settings, IoT can bring the same efficiencies to manufacturing processes and distribution systems that the internet has long delivered to knowledge work. Billions of embedded internet-enabled sensors worldwide provide an incredibly rich set of data that companies can use to

improve the safety of their operations, track assets and reduce manual processes. Data from machines can be used to predict whether equipment will break down, giving manufacturers advance warning to prevent long stretches of downtime.

II. EXPERIMENTAL METHODOLOGY

A. Methodology

This IOT based controlled home appliances project mainly depends upon the advanced technology by evolving digital world day by day through the way like change of way seeing daily needs to do and utilizing the technology to surviving professionally and in home applications as well. This project mainly consists of two parts. They are the hardware and software. The hardware mainly comprises of node MCU (microcontroller), relay, exhaust fan led, relay and bulb. The software part is only an android BLYNK app and server. The load can be controlled and monitoring using a web page BLYNK app) with user configurable front end. The user can send commands through the allowed IP address and these commands are fed to Wi-Fi module of node MCU micro controller of the circuit. The Wi-Fi module is configured to access the internet using any wireless modem. The commands received by a Wi-Fi module are executed by a program with in a Wi-Fi module. To achieve the home control using smart phone, initially the mobile unit should be connected to any network and the Wi-Fi module ESP8266 which is on ESP32 should be connected to local network. By touching the specified location of widgets in the BLYNK app, this BLYNK app sends ON/OFF commands to ESP32 via BLYNK server. Then the relays connected to ESP32 perform switching operation corresponding to the input. So that the loads connected to relays will be switched ON/OFF. Similarly, we can also control our home appliances using manual switches. This can be obtained by connecting the relays outputs to manual switches and manual switches to the AC loads. Whenever the relay corresponding to manual ON or OFF is switched ON then the AC loads corresponding to that switches will perform switching operation.

B. Analysis

Home automation is a network of hardware, communication, and electronic interfaces that work to integrate everyday devices with one another via the

internet. Each device has sensors and is connected through Wi-Fi, so you can manage them from your smartphone or tablet whether you're at home, or miles away. This allows you to turn on the lights, lock the front door, weather monitoring, fire detection, window control, remote control. Home automation works on three levels: Monitoring: monitoring means that users can check in on devices remotely through an app. For example, someone could view their live feed from a smart security camera. Control: control means that the user can control these devices remotely, like panning a security camera to see more a living space. Automation: finally, automation means setting up devices to trigger one another, like having a smart siren go off whenever an armed security camera detects motion.

III. MODELLING ANALYSIS

Sensors can monitor changes in daylight, temperature, or motion detection. Home automation systems can then adjust those settings (and more) to your preferences. Controllers refer to the devices—personal computers, tablets or smartphones—used to send and receive messages about the status of automated features in your home. Actuators may be light switches, motors, or motorized valves that control the actual mechanism, or function, of a home automation system. They are programmed to be activated by a remote command from a controller. In this project we are using different sensors for smart home automation, monitoring and alerting system which detects different applications the sensors are: MQ2 sensor, Ultrasonic sensor, DHT22 sensor, LM393 LDR Sensor, TSOP sensor, and MC38 sensor. MQ2 sensor which is used to detect the smoke. DHT22 sensor which is a temperature sensor. By using this we can control fan based on temperature. LM393 LDR sensor which is used for automatic light control. MC38 sensor is a door and window control sensor. There are two CPU cores that can be individually controlled, and the clock frequency is adjustable from 80 MHz to 240 MHz. The user may also power off the CPU and make use of the low-power co-processor to constantly monitor the peripherals for changes or crossing of thresholds.

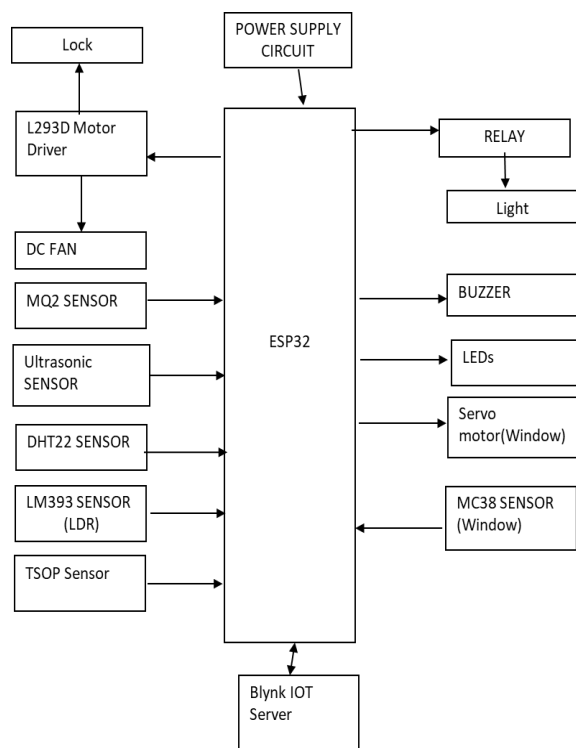


Figure 1: Block Diagram

IV. RESULTS AND DISCUSSION

The project “IOT Based Smart Home Automation and Security System” has been Successfully designed and tested. Integrating features of all the hardware components used have developed it. Presence of every module has been reasoned out and placed carefully thus contributing to the best working of the unit. Secondly, using highly advanced IC’s and with the help of growing technology the project has been successfully implemented. Hence, we concluded the project.

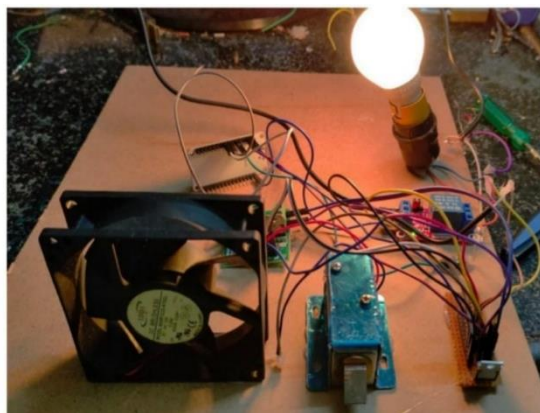


Figure 2: LED Light Turns On

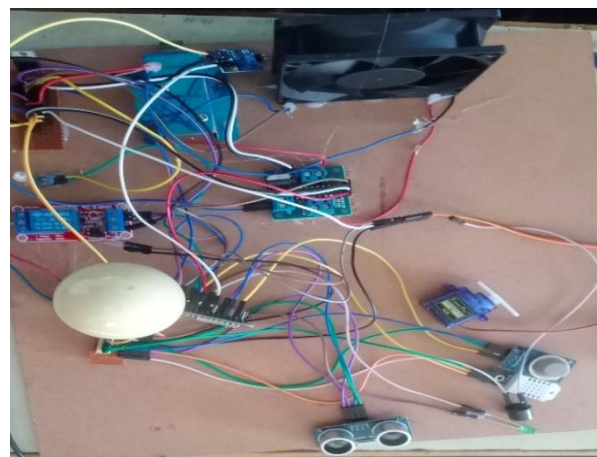


Figure 3: Sensors Connected

VII. CONCLUSION

This System can be enhanced by adding camera for love monitoring. Adding water sprinkler to this system can prevent the fire accidents in the house. The home automation using Internet of Things has been experimentally proven to work satisfactorily by connecting simple appliances to it and the appliances were successfully controlled remotely through internet. This will help the user to analyze the condition of various parameters in the home anytime anywhere.

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