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IoT BASED SMART HOUSE & SHORT CIRCUIT PROTECTION & DETECTION SYSTEM

Sarang Malusare[1], Moin Kazi[2], Mohammad Abrar[3] ,Shaikh Shahrukh[4]

Manish Mahale[5]

[1]*Department of Electrical Engineering, GHRIBM Jalgaon*
[2]*Department of Electrical Engineering, GHRIBM Jalgaon*
[3]*Department of Electrical Engineering, GHRIBM Jalgaon*
[4]*Department of Electrical Engineering, GHRIBM Jalgaon*
[5]*Assistant Professor, Dept. of Electrical Engineering, GHRIBM Jalgaon, Maharashtra, India*

Abstract -*As the world becomes increasingly connected, digitalization is a key differentiator that will enable. By using IoT smart devices which generate huge volumes of digitalized data, which promises lower costs, improved production quality, enhance flexibility, increase efficiency, shorter response time as per market demands, and also opens up new innovative opportunities. IoT is Internet of things which interconnect the computing devices through the internet which encompassed both sending and receiving. When such concept is added in house application it aptly incorporated to make smarter and automated.*
Our Project is focused on to build a smart automated home system which is secured from short circuit conditions and raised alarm optionally. Beside from that our new innovative system also consists of Wi-Fi Connected Controller which can gives alert and status of the IoT based System.

Key Words: (digitalization, IoT, smart, Wi-Fi, Controller)

1. INTRODUCTION

IOT or Internet of things is an innovative technology which permits to control hardware appliances by using web. In this paper we tend to propose to use IOT so as to handle home appliances, and automate the home system through the internet and as well as the system also protect the appliances under short circuit conditions. This system uses the loads to demonstrate as house lighting and cooling appliances. Our system interface allows a user to ease in control the home appliances by using internet. For this system we use a microcontroller which is interfaced with a Wi-Fi modem to get user commands through internet. The system consists of LCD display which displays the system status. Relays which are used to switch loads. When the signal or command is received to microcontroller through internet, microcontroller operates the load according to instruction and display the system status on LCD display. Thus the new innovative system allows for efficient home automation over the internet.

1.1 What is IoT?

Internet of Things is an interconnected and interrelated system of computing device, which has ability to transfer the data over the network by using internet. It describes a corporeal objects or things that are fixed with sensors software and other technologies for the purpose of connecting and transferring a data with the other devices with less human interference. The exchange of data can be done by using internet.

In recent years, Internet of things has one of the important technologies in 21stcentury.By using the IoT our daily life become so easy. By using smart IoT devices we can connect our daily appliances – kitchen equipment, cars, baby monitors, through the internet , and communication is also possible between person, devices etc.

Using IoT devices, low-cost computing, the cloud, big data, analytics, and mobile technologies, physical things can share and collect data with less human effort. In this fast growing world, digital working system can control, record, and adjust each interaction between connected devices. The physical world meets the digital world—and they work efficiently.

2. IoT BASED HOME AUTOMATION SYSTEM (HAS)

Home Automation is a technology to automate or remotely controlled various household functions. For example the operation of lighting, heating and entertainment device. The main purpose of home automation is to make home simpler, better and accessible. The IoT based Home Automation system aims to bring the control & monitor your every day home electrical devices, thus giving user

affordable lighting system, better optimum use of energy. Apart from this, the innovative concept also further extends to possess a overall control over your home security also as build a centralized home entertainment system and far more. The Internet of Things based Home Automation system, as the name suggests aims to control all the devices of your smart home through internet protocols or cloud based computing. The IoT based Home Automation system offer tons of flexibility over the wired systems s it comes with various advantages like ease-of-use, ease-of-installation, avoid complexity of running through wires or loose electrical connections, easy fault detection and triggering and above and everyone it even offers easy mobility.The main objectives of IoT based Home Automation System are as follows:1) Control Home Appliances by using Application.2) Real Time Video Streaming from Web Camera.3) Controlled by any device capable of Wi-Fi (Android, IOS, and PC).4) Extensible platform for future enhancement.

3. SYSTEM DESIGN

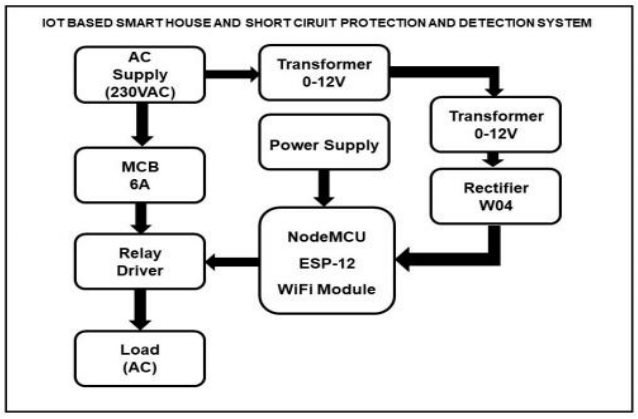

Fig -1: Blocked diagram of IoT Based Smart House & Short Circuit Protection and Detection System

3.1 Arduino Uno

It is an open-source microcontroller board based on the Microchip ATmega328P microcontroller and which is developed by Arduino.cc. The board consist of sets of digital and analog input/output (I/O) pins that may be interfaced to various expansion boards and other circuits It 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), with a type B USB cable. It can be powered by using external 9-volt battery, though it accepts voltages in between 7 and 20 volts.

The word "uno" stands for "one" which is Italian word and was chosen to mark the initial release of Arduino Software

Fig -2: Aurduino Uno

3.2. ESP8266 (Wi-Fi Module)

The ESP8266 is a Wi-Fi microchip, with a full TCP/IP stack and microcontroller capability.

Features:

1. Processor: L106 32-bit RISC microprocessor core based
2. Memory:
    a. 32 KB instruction RAM
    b. 32 KB instruction cache RAM
    c. 80 KB user-data RAM
    d. 16 KB ETS system-data RAM
3. IEEE 802.11 b/g/n Wi-Fi
4. 16 I/O pins

3.3 LCD

It is a flat-panel display or electronic visual display which uses the light regulating properties of liquid crystals. Liquid crystal does not emit light directly. LCDs are used in many applications including computer monitors, televisions, instrument panels, aircraft cockpit displays. They are also used in consumer devices such as DVD players, gaming devices, clocks, watches, calculators, and telephones, and have replaced cathode ray tube (CRT) displays in early all applications.

3.4 MCB

A miniature circuit breaker or MCB is an electromagnetic device which consists of molded insulating material. The primary function of MCB is to switching the circuit. It means to automatically open the circuit which has been connected to it when the current passing through the circuit goes beyond a set value or limit. The device can be manually switched ON or OFF just like normal switches whenever necessary.

5. ADVANTAGES

1. Manage all the home appliances from one place
2. The system is flexible in nature
3. Increase in Home security
4. Remotely control all appliances
5. Energy efficient system

6. CONCLUSION

The smart home automation using Internet of Things has been experimentally proven to work satisfactorily by connecting home appliances to it and the appliances were successfully controlled remotely through internet and application. The new innovative system not only analyzed the sensor data, but also controlled the various applications & also operates process according to the requirement, for example switching on the fan only when person is in room. It also protects the system and home appliances from short circuit conditions.

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