IoT based home automation system using NodeMCU ESP8266 module

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ABSTRACT

In this project, we are going to make an IOT based home automation system using NODEMCU ESP8266 Wi-Fi module and. Using this we will be able to control home appliances through a web browser using your PC or mobile. These AC mains appliances will be connected to relays which are controlled by the NodeMCU ESP8266 and NodeMCU acts as a Web Server and we will send control commands through a Web Browser like Google Chrome etc. ESP8266 is the one of the most popular and low-cost Wi-Fi module available in the market today. The goal of this project is to develop a home automation system that gives the user complete control over all remotely controllable aspects of his/her home.

Keywords: NodeMCU ESP8266, IoT, Web Server.

1. INTRODUCTION

The project aims at designing an advanced home automation system using NodeMCU ESP8266 module. The devices can be switched ON/OFF and read using mobile through Wi-Fi. The hunger for automation brought many revolutions in the existing technologies. These had greater importance than any other technologies due to its user-friendly nature.

Wi-Fi:- is wireless technology that uses radio frequency to transmit data through the air. Wi-Fi transmit data in the frequency Band of 2.4 GHz. The range of Wi-Fi technology is 40-300 feet.

Controlling devices for the automation of the project is NodeMCU. The data sent from mobile over Wi-Fi will receive by Wi-Fi module connected to NodeMCU. NodeMCU reads the data and decides the switching action of electrical devices connected to it through Relays.

2. LITERATURE REVIEW

In this paper S.Anusha, M.Madhavi, R.Hemalatha has developed an IoT based home automation system, using a microcontroller and android application. The micro-controller used is ATmega328. They have used GSM module which helps the system to be used remotely [1].

In this paper, Rajeev Piyare presents a home control and monitoring system using an embedded micro-web server, with IP connectivity for accessing and controlling appliances remotely using Android based Smart phone app. To demonstrate the feasibility and effectiveness of this system, devices such as light switches, power plug, temperature sensor and current sensor have been integrated with the proposed home control system [2].

In this paper Ahmed ElShafee, Karim AlaaHamed presents a design and prototype implementation of a new home automation system that uses WiFi technology as a network infrastructure connecting its parts. Their system consists of two main components; the first part is the server (web server), which presents system core that manages, controls, and monitors users’ home. Users and the system administrator can locally (LAN) or remotely (internets) manage and control system code. The second part is hardware interface module, which provides an appropriate interface to sensors and actuator of home automation system [3].

R.Piyare has introduced design and implementation of a low cost, flexible and wireless solution to the home automation. [4]

Jitendra R implemented a system with the ZigBee network and showed how to eliminate the complication of wiring in case of wired automation. [5]
3. OBJECTIVE

This project aims to develop a home automation system that gives the user complete control over all remotely controllable devices of his/her home using IOT.

4. PROPOSED SYSTEM

The system has two parts, namely; hardware and software. The hardware system consists of NodeMCU board, Relay driver, and home appliances. The software consists of the Web page. HTML language is used to configure the NodeMCU board. In this system, the components used are NodeMCU board, the relay driver. These hardware components are used in order to control the home appliances. NodeMCU board will help to develop an interface between the hardware and the software application. The NodeMCU Wi-Fi will help in transmitting and receiving the input given by the user.

Fig -1: Proposed System

Part1- The main path of the appliance is controlling basic power using webpage which is made by us. The main part of NodeMCU is that it acts as an interface between hardware component and software (Application).

Part 2- Project will be compiled. Compilation of all the modules will be done. The whole system will be executed and will be able to run perfectly.

4. NODEMCU

NodeMCU is an open source IoT platform. The term "NodeMCU" by default refers to the firmware rather than the dev kits. It includes firmware which runs on the ESP8266 Wi-Fi SoC and hardware which is based on the ESP-12 module. The firmware uses the Lua, C, C++ scripting language. It is built on the Espressif Non-OS SDK for ESP8266.

5. WHY NODEMCU?

- NodeMCU is open source IoT platform.
- Low cost.
- Integrated support for the WIFI network.
- Reduced size of the board.
- Low energy consumption.

6. CONCLUSIONS

A Smart Home system integrates electrical devices in a house with each other. The techniques which are going to use in the home is 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. In this paper, we are planning to eliminate most of the human interaction by providing the intelligent system. Development of such Smart Home achieve by using the Internet of Things technologies. By using this system we can actually manage to make low cost, flexible smart homes to adjust its environmental conditions and resolve its errors with energy saving.
7. REFERENCES


