



“IOT Based Home Automation System”

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Abstract: This project presents the overall design of Home Automation System (HAS) with low cost and wireless system. It specifically focuses on the development of an IOT based home automation system that is able to control various components via internet or be automatically programmed to operate from ambient conditions. In this project, we design the development of a firmware for smart control which can successfully be automated minimizing human interaction to preserve the integrity within whole electrical devices in the home.

A smart home will take advantage of its environment and allow seamless control whether the user is present or away. With a home that has this advantage, you can know that your home is performing at its best in energy performance. Implementing this system will allow you to explore a variety of engineering tasks, including software programming, circuit board design, Wi-Fi, TCP/IP protocols, web server logic design, and other aspects. This automation system allows you to better understand the challenges of software and hardware development.

INTRODUCTION

The concept of "home automation" has been around for several years. "Smart Home", "Smart Home" are terms used to refer to the concept of network devices in the home. Home automation systems include centralized control and remote monitoring of the health of lighting, security systems, and other appliances and systems in your home. Home automation systems provide energy efficiency, improve security systems and, of course, increase user comfort and convenience. Currently, in emerging markets, HAS is gaining popularity and interest from many users. Home automation systems face unique challenges. Basically, current end users, especially the elderly and people with disabilities, have benefited enormously, but complexity and cost factors are preventing the system from being embraced.

PROBLEM STATEMENT

People with busy lives these days often forget to turn off their devices at home. As humans, we cannot escape from our clumsy and busy lives. Sometimes I make it so rushed that I sometimes forget to turn off the lights. This causes electricity prices to skyrocket. Also, this is one of the electricity losses that makes the planet unhealthy. Additionally, the elderly and people with disabilities were challenged with manual access to lighting and fan controls instead of automated processes.

PROJECT OBJECTIVES

4.1 To formulate the design of an interconnected network of home appliance to be integrated into the Home Automation System . The objective to account for every appliance and its control to be automated and integrated into the network further formulated into the Home Automation System .

4.2 To develop the application that would include features of switch and/or voice modes to control the applications.

4.3 Being able to view the status of home appliances on the application, in order have a better Home Automation System

4.4 Controlled by any device capable of WiFi (Android, iOS, PC) To achieve flexibility in control of the home appliances, and device capable of WiFi connectivity will be able to obtain a secure control on the Home Automation System.

4.5 Given the existing ability to add and integrate additional functions and devices into the system, the developed system should inherently be highly scalable.

SCOPE

The goal is to develop a prototype that provides wireless remote control of a home appliance network. The app is designed to run on Android devices and offers features such as toggle mode control, voice command control and the ability to view device status from within the app itself. Considering the wide range of applications, the scope of this prototype is as follows: This system can be implemented in homes, small offices, and shopping centers responsible for managing consumer electronics. For remote access to devices on the Internet or intranet. Devices in the above environment can be managed on an intranet or accessed via the Internet. Development of a technology-friendly environment. These systems include the use of technology and the creation of home automation systems. By using our everyday gadgets, we can use them from a different perspective.



LITERATURE SURVEY

“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, Node MCU 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.

“IOT Based Smart Security and Home Automation”, by Shardha Somani, Parikshit Solunke, Shaunak Oke, Parth Medhi, Prof. P. P. Laturkar.

This paper focuses on a system that provides features of Home Automation relying on IOT to operate easily, in addition to that it includes a camera module and provides home security. The android application basically converts Smartphone into a remote for all home appliances. Security is achieved with motion sensors if movement is sensed at the entrance of the house; a notification is sent that contains a photo of house entrance in real time. This notification will be received by the owner of the house via internet such that app can trigger a notification. So owner can raise an alarm in case of any intrusion or he/she can toggle the appliances like opening the door if the person is a guest. The system uses Raspberry Pi, a small sized computer which acts as server for the system. The smart home consist two modules. Home automation that consists; fan light and door controller, and security module that consists; smoke sensor motion sensor and camera module.

HARDWARE AND SOFTWARE REQUIREMENT SPECIFICATION

Software Components :-

- Arduino IDE
- Server

Hardware Components :

- Arduino UNO R3
- Bluetooth Module HC 05
- Relay Module
- Printed Circuit Board
- Wires
- Power Supply
- WiFi

PROPOSED SYSTEM :

The Android OS gives you the flexibility to use open source code. Easy access to built-in sensors. Applications used for system administration have the following features: Android Phone acts as a client and data is sent via socket programming. The application accepts user commands in two different modes.

Switch Mode: Switch Mode uses switches used to control household appliances. A radio button sends the state of the radio button.

Voice Mode: Voice mode is used to control household appliances using voice commands. The app uses the smartphone's built-in microphone to generate an intent to get voice data to Google's servers, which respond as string data. String data is further parsed and then processed.

The developed prototype features:

A wireless remote switching system for home appliances is installed on the prototype.

Prototype set up radio control using Wi-Fi, providing an indoor range of approximately 150 feet.

You can use the switch in the application on your smartphone to give a command to turn the device on and off.

Provisions have also been made to remotely switch household appliances using voice commands from a smartphone.

You can control the prototype using any device that has a WiFi connection.

Control of household appliances is carried out over a secure connection over SSL over TCP, SSH.

Simple design, easy to graft and expandable to various home appliances.



Displays the status of each device in the smartphone's application.
Economical.

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