A Synopsis on

Home Automation at a Click Using IoT

Submitted in partial fulfillment of the requirements
of the degree of

Bachelor of Engineering

in

Information Technology

by

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CERTIFICATE

This is to certify that the project Synopsis entitled ***"Home Automation at a Click Using IoT"*** Submitted by ***"Akhil Jain (18204005),Sagar Gabre (18204011),Saunvid Ganbavale (17104052)"*** for the partial fulfillment of the requirement for award of a degree ***Bachelor of Engineering*** in ***Information Technology*** to the University of Mumbai,is a bonafide work carried out during academic year 2020-2021

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Declaration

I declare that this written submission represents my ideas in my own words and where others' ideas or words have been included, I have adequately cited and referenced the original sources. I also declare that I have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in my submission. I understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

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Abstract

With advancement of Automation technology, life is getting simpler and easier in all aspects. In today's world Automatic systems are being preferred over manual system. With the rapid increase in the number of users of internet over the past decade has made Internet a part and parcel of life, and IoT is the latest and emerging internet technology. Internet of things is a growing network of everyday object-from industrial machine to consumer goods that can share information and complete tasks while you are busy with other activities. Wireless Home Automation system(WHAS) using IoT is a system that uses computers or mobile devices to control basic home functions and features automatically through internet from anywhere around the world, an automated home is sometimes called a smart home. It is meant to save the electric power and human energy. The home automation system differs from other system by allowing the user to operate the system from anywhere around the world through internet connection.

In this paper we present a Home Automation system(HAS) that employs the integration of networking, wireless communication, to provide the user with remote control of variouslights, fans, and appliances within their home.This system is designed to be low cost and expandable allowing a variety of devicesto be controlled.

Introduction

Homes of the 21st century will become more and more selfcontrolled and automated due to the comfort it provides, especially when employed in a private home. A home automation system is a means that allow users to control electric appliances of varying kind. Many existing, well-established home automation systems are based on wired communication.

This does not pose a problem until the system is planned well in advance and installed during the physical construction of the building. But for already existing buildings the implementation cost goes very high.

In contrast, Wireless systems can be of great help for automation systems. With the advancement of wireless technologies such as Wi-Fi, cloud networks in the recent past, wireless systems are used every day and everywhere.

Objectives

The main objective of this project is to build a smart home device which can be used to control the home appliances via internet. The home automation device that you build can be integrated with almost all the home appliances.

To facilitate the wireless connectivity with the system, the Arduino Uno will be embedded with a WiFi module. This establishes the internet connection to the system and all the home appliances can in turn be connected and controlled by internet.

Literature Review

Wi-Fi based home automation system mainly consist three modules, the server, the hardware interface module, and the software package. The figure shows the system model layout. Wi-Fi technology is used by server, and hardware Interface module to communicate with each other. The same technology uses to login to the server web based application. The server is connected to the internet, so remote users can access server web based application through the internet using compatible web browser. Software of the latest home automation system is split to server application software, and Microcontroller (Arduino) firmware. The Arduino software, built using C language, using IDE comes with the microcontroller itself. Arduino software is culpable for gathering events from connected sensors, then applies action to actuators and preprogramed in the server. Another job is to report the and record the history in the server DB. The server application software package for the proposed home automation system, is a web based application built using asp.net. The server application software can be accessed from internal network or from internet if the server has real IP on the internet using any internet navigator supports asp.net technology. Server application software is culpable of, maintain the whole home automation system, setup, configuration. Server use database to keep log of home automation system components, we choose to use XML files to save system log.

Problem Definition

Home automation refers to control the home appliances by using computer technology. Computer Systems enables from remote control of lighting through to complex micro-controller or computer based networks with various degrees of intelligence and automation. Home automation provides security, energy efficiency and ease of use hence, it is adopted more. It also provides remote interface to home appliances to provide control and monitoring on a web browser.

Figure 1: The proposed home automation system layout

Proposed System Architecture/Working

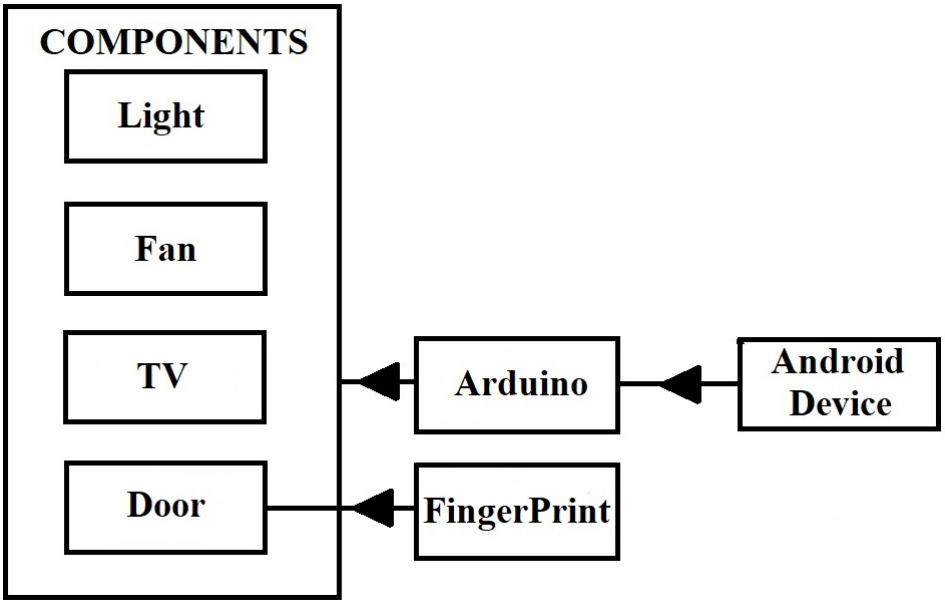

Figure 2: The Proposed System Architecture

In this system android application is used to send signal to Arduino board and Bluetooth module connected to Arduino send this signal to Arduino for controlling appliances using relay board. Android application in mobile sends the signal to the Bluetooth module which is connected to same network. Android application has all the GUI buttons for each appliances. Bluetooth module receive the signal from the mobile application and give this signal to the Arduino board for processing. We're using Arduino board as controller to control all the appliances. Relay board and Bluetooth module is connected to Arduino board. Each command is processed by Arduino board and control the relay board for switching on/off the appliances. Relay boards are used as electrical switches, for performing on/off operation. Power supply is provided through the relay board to the appliances. Finally user can access the android application in mobile and give command to Bluetooth module which is connected to Arduino which can control the all appliances.

Design and Implementation

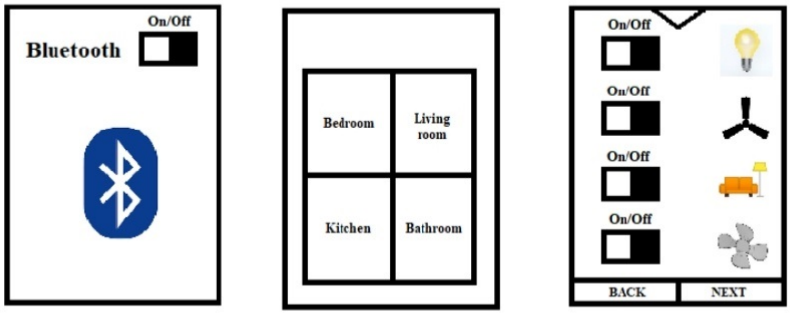

Figure 3: Design and Implementation

Smart Home is an application that makes it easy to connect WiFi devices to your phone or tablet so you can control your appliances or sensors anywhere in the world, or only from your local network.

In this way you can control the house lights, TV, air conditioners and so on, and set different parameters, for any of them.

The application does not use a web server to connect to, so you do not have to pay a monthly fee, or be addicted to a particular site.

Summary

What really would compel someone to actually develop a product which is a complete IoT-based home automation system? Could it be the need to improve the safety of your home, could it be the desire to live a Jetson-like life that millennials always dreamt of. It is difficult to say, often, it is even more difficult to visualize the technology that is required to build a home automation platform. Due to the complexity introduced by software, hardware and networking ecosystems, it becomes extremely important to learn, understand and utilize the right home automation technology for your smart home product.

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1 Publication

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