

1.1 Overview

Nowadays technology can enhance human life. Technology is evolving decade by decade and automation was a science fiction earlier but not today. By combining latest technology with home, it is possible to build an awesome home. With the Raspberry Pi , a home automation system that is capable of operating home devices automatically can be built.

Manual control of buildings and using traditional ways of observing consumes a lot of time, effort and cost. Building a developed technology to observe and control allow the government/public services the opportunity to reduce energy and maintenance costs and also improve the comfort conditions and productivity levels.

This project will develop a control system with android mobile application to remotely control any electric equipment in the building through the internet. The technology is going to be very possible to apply and develop with advance of soft computing combined with hardware manipulation.

1.2 Problem Statement

There are different types of large public buildings, such as commercial buildings, factories, etc. The electrical equipments in those buildings are manually controlled for power switching. The usage of such control method is tedious, time consuming and costly.

1.3 Proposed Solution

To develop a system that enables users to automatically remote access and automatically controls home equipments.

1.4 Aim

The aim of this work is to develop smart system for home control.

1.5 Objectives

The main objectives of this thesis are:-

1. Designing an embedded control system based on raspberry pi for remotely observing and controlling the devices through the internet
2. Developing a mobile application to control the devices using the smart phone.
3. Testing the whole system to examine its performance.

1.6 Methodology

The methodology of the system design can be divided into two phases; hardware implementation and software development. The hardware implementation includes building the main controller, sensor networks and the smart home while the software development focuses on the programming of the Raspberry pi and the arduino controller.

A communication between a client and a server is to be developed to control and observe the electrical equipments located in a building as

shown in Figure 1. The client is to be an android mobile phone. Android software that can communicate through the internet with the server will be developed so that the user can access the building through his mobile phone.

The server is a raspberry pi 3 computer. Software will be written that receives commands from the client and transfer it to arduino which is responsible of controlling the electrical appliance. Electrical equipments such as fan, lamp ... etc. will be connected through the control pins of arduino, so the user can access them for the off/on process.

1.7 Thesis Organization

Chapter One: introduces the problem and the proposed solution .

Chapter Two: about previous work.

Chapter Three: gives an overview of the component used to implement the system

Chapter Four: describes the system design and the process in details and discuss results .

Chapter Five: concludes the thesis.