Smart Home Automation using IOT

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Abstract: Smart Building not only refers to reduce human efforts but also energy efficiency and time saving. In this ASP.NET is used in which appliances are connected to sensors and sensors give status of appliances to the web. Here electric appliances are operated by the website. The main objective of home automation and security is to help handicapped and aged people that will enable them to control home appliances and alert them in critical situations.

Keywords: smart, automation, sensors.

I. INTRODUCTION

Home automation refers to handling and controlling home appliances by using micro-controller or computer technology. Automation is popular now days because it provides ease, security and efficiency. In this, a sensor senses the status of appliances and updates to web server. If user is far away from home, he can access and change status of appliances i.e. switches it on/off. User can use local PC. This paper will describe approach of controlling home appliances by using web server.

A. Problem statement

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.

II. LITERATURE SURVEY

N. Sriskanthan [8] has implemented the model for home automation using Bluetooth via PC. But, Bluetooth has range limitation.

Hasan [9] has developed a telephone and PIC remote controlled device for controlling the devices.pin check algorithm was used to implement the system where it was with cable network but not wireless communication.

Figure 1.Home automation system block diagram
by R. Piyare

Amul Jadhav [10] has used universal XML format to design automation system which can be easily ported to any other mobile devices.

R.Piyare [12] has introduced design and implementation of a low cost, flexible and wireless solution to the home automation.

Jitendra R. [11] implemented a system with the ZigBee network and showed how to eliminate the complication of wiring in case of wired automation.

III. IMPLEMENTATION

A. ASP.net

ASP.NET is a server-side web application framework used for designing dynamic web pages. It was developed by Microsoft. We can build dynamic web services, web pages and web applications by asp.net. We are using this to build web server which handle status of appliances. User will access devices by using web site. He will check and change status of devices.

B. Software Design

As discussed earlier, we are developing a website. The application consist functions like light, fan, humidity and temperature control. When website opens, user is authenticated

Moved to main screen which displays home appliances. User has to select one to access it. Then he can check and change its status if he wishes. The proposed system is a distributed automation system which consists of server and sensors. Server controls and monitors the various sensors. It can be configured to handle more hardware and sensors.

The Intel Galileo development board, with built in Wi-Fi card port to which the card is inserted, acts as web server. This system can be accessed from the web browser from any PC in the same LAN using server IP, or it can be accessed remotely through real IP or mobile handheld device connected to the internet with appropriate web browser through server internet IP. Wi-Fi technology connects server and the sensors. Wi-Fi is chosen to improve system security and to increase system mobility and scalability.
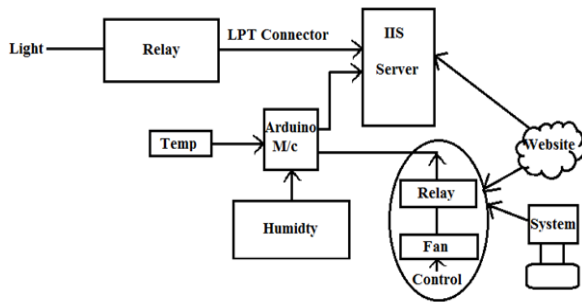
figure 2 block diagram of smart building architecture

C. Arduino

We are using Arduino microcontroller board based on the ATmega2560.Sensors are attached to it and updating will be done on web server. We have chosen C++ platform for development. The coding will be done in C++.It can performs specific functions.

figure 3 Arduino micro-controller
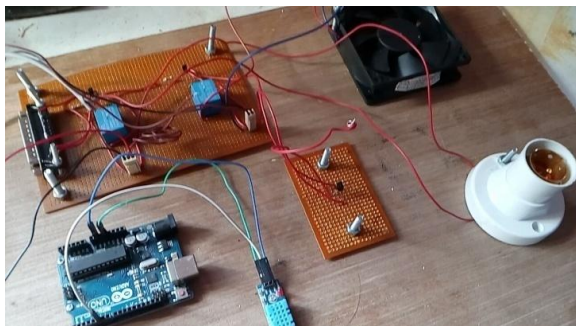
D. Hardware Design

Fig 4 hardware connection

System hardware is divided into three parts i.e. PCB, humidity sensor, and Arduino controller. Relay, LPT port, transistor, diode resister are integrated on PCB. We have connected two devices to the PCB i.e. fan and light. Humidity sensor is connected to Arduino .It will sense humidity and temperature as well. Arduino and PCB are connected to PC..Arduino and PCB will interact with each other through PC.

IV. PERFORMANCE ELEMENT

We have measured temperature and humidity. We have set time by which it continuously senses temperature and humidity. In the screenshot given below, it continuously senses temperature and humidity after every 5 seconds.

Table I: performance reading

Sr no	Parameter	Reading
1	Temperature	21
2	Humidity	27

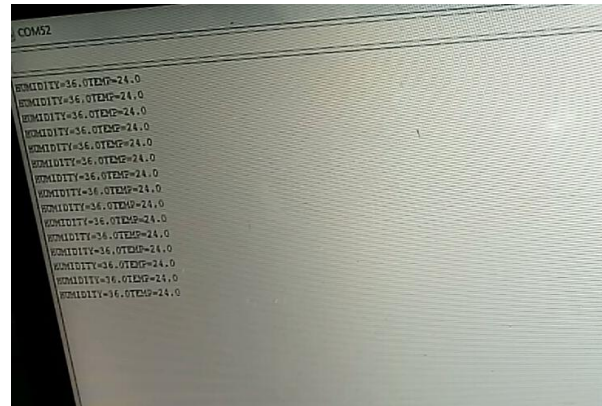

Fig 5 Displaying current temperature and humidity

V. APPLICATION

(a) Lighting Control: Leaving the Dark Ages and Stepping Into the Light
(b) HVAC Regulation: No Longer Burned by Your Heating Bill
(c) To help Handicapped people
(d) Where less energy consumption is major factor

VI. ADVANTAGES

(a) Adds Safety Through Appliance and Lighting Control
(b) Secures Home Through web control Increases Convenience through Temperature Adjustment
(c) Save time
(d) Save money and increase convenience
(e) Allow to appliances control when out of town

VII. CONCLUSION

This paper gives basic idea how we can control home appliances by computer technology. The main objective of this project is to help handicapped people. It provides security and saves energy. As we are accessing devices by website, we can access it even if we are far away from home where the Wi-Fi is available.

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