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Smart Home Automation using Sensors

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Abstract

Home automation is controlling and automation of lighting, heating, ventilating, air conditioning and security of home appliances. For monitoring and controlling the appliances, automation is the topmost technology. The home appliances maybe light, door, fan, AC etc….Our paper represent a smart home automation based on sensors where the appliances are itself connected to sensors. The sensors gives the status of appliances to the website ASP.NET. The main moto of the smart home appliances is to help handicapped and aged people.

Introduction

Home automation or smart home which is also known as Domotics, is nothing but building for the home. Home automation based on sensors takes input from the physical environment and uses built-in compute resources to perform pre-defined functions upon detection of specific input and then process data before passing it on.

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.

LITERATURE SURVEY

N. Sriskanthan [01] has implemented the model for home automation using Bluetooth via PC. But, Bluetooth has range limitation. In Present situation all the people are familiar with smartphones .They are using every time it makes them to use these to control home appliances by using the android app. So that we can use to control the electrical appliances either with text or voice commands. These commands which send through Bluetooth to Arduino Uno. So the people no need to switch off or on the devices while doing some work like watching T.V. or Reading

The circuit which consists of Arduino Uno Board, Bluetooth model HC-05 and a 3-channel relay board.

The controlling capacity is based on the number of channels which depends on number of appliance.

The power capacity of Arduino Uno is 12V DC. By using the board power supply of Arduino Uno the relay module and Bluetooth model will turn on.

Hasan [02] 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.

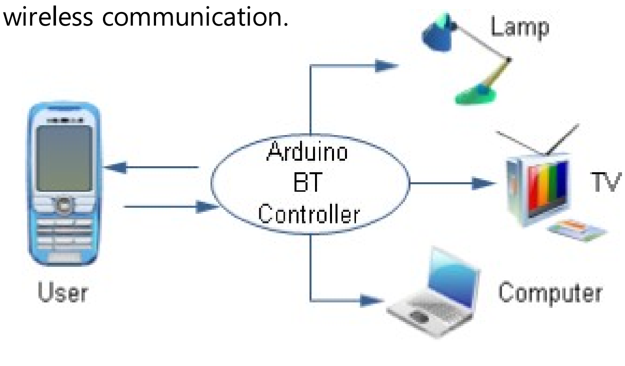

Figure1.Home automation system block diagram.

Amul Jadhav[03] has used universal XML format to design automation system which can be easily ported to any other mobile devices.

R.Piyare [05] has introduced design and implementation of a low cost, flexible and wireless solution to the home automation.

Jitendra R. [04] implemented a system with the ZigBee network and showed how to eliminate the complication of wiring in case of wired automation.

PROPOSED SYSTEM

ASP.NET:

ASP.NET is a open source server-side technology that enables computer code to be executed by an internet server. When a browser request an ASP or ASP.NET file, the ASP engine reads the file, executes the code in the file, and returns the result to the browser. 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.

Software Design

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

The screen of the application displays the menu of the appliances to the user. The appliances maybe light, fan, AC etc.. He can choose or change the status as he wishes. Our system consists of sensors and servers. The sensors are controlled by server. The server handles many hardware and sensors.

To operate the website, the user need WI-FI card port. The user can use the sensor only when WI-FI card port is inserted, which acts as webserver. WI-FI technology connects the sensors and server. The user can also access the web browser using server internet IP. The Intel Galileo as developed this board. The Galileo board is also software compatible with the Arduino software development (IDE) .

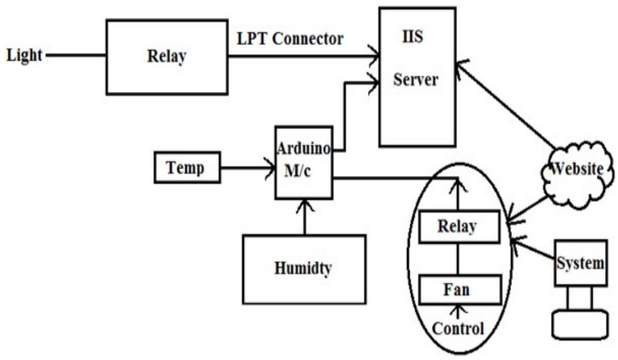

figure2: block diagram of smart building architecture

Arduino

Arduino is an open source computer hardware. It can sends and control objects in the physical world. We are using Arduino microcontroller board based on the ATmega2560.The board is equipped with sets of digital and analog input/output. The microcontrollers are programmed in C/C++.

figure3: Arduino micro-controller

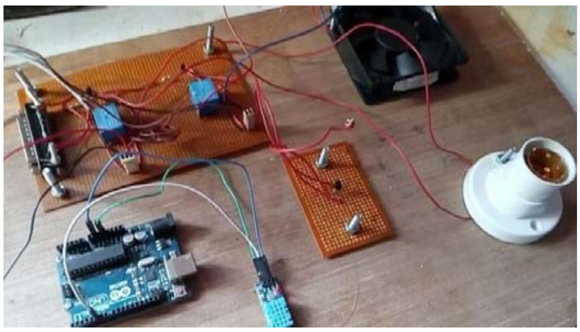

Fig 4 hardware connection

Hardware design

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.

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 the temperature and humidity after every 5seconds.

Table I: performance reading

sl	Parameter	Reading
1	Temperature	21
2	Humidity	27

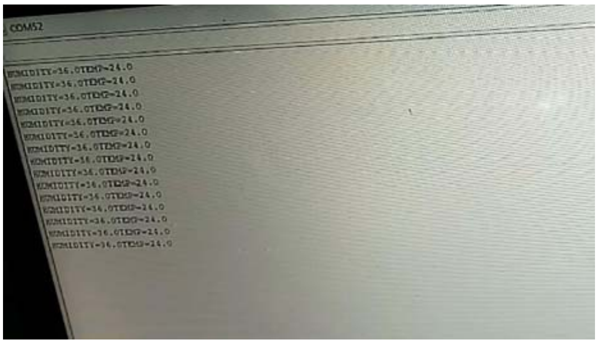

Fig 5 Displaying current temperature and humidity

ADVANTAGES

Adds Safety Through Appliance and Lighting Control Secures Home Through web control Increases ,Convenience through Temperature Adjustment, Save time, Save money and increase convenience ,allow to control appliances when out of town.

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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References

[1]N.Sriskanthan "Bluetooth based home automation system" Journal of Microprocessor and microsystem, vol-26, 2002.

[2]E.Yavly, B.Hassan and K.Duggur Safe and secure PIC. Board Remote Control application for intelligent Home. International Journal of computer science and network security, (2007).

[3]Amul Jaahav, S.Anand, Nilesh Dhaugara, K.S.Wagh "Universal Mobile Application Development (UMAD) on home automation", (2012).

[4]Kana, Rajendra & Pawar, Sunil N "Zigbee Based Home Automation", (2010).

[5]K.Pivare, M.Lazi "Bluetooth Based Home Automation System Using Cellphone", (2011 IEEE).

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