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Controlling the Home Appliances Remotely Through Web Application Using ZIGBEE

Dr. K.Karuppasamy M.E., PhD[1], S.Gowtham[2], S.A.Athira[3], M.Ajitha[4]
[1] Head Of Department, Department of Information Technology, RVS College of Engineering and Technology, Tamil Nadu, India
[2,3,4] Student, Department of Information Technology, RVS College of Engineering and Technology, Tamil Nadu, India

Abstract*—In today's world Automatic system is ubiquitous communication over manual system. The IoT can assist in integration of communications, control, and information processing across various systems. The Internet of Things allows objects to be sensed and controlled remotely. 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. Here we present a home automation system using ZigBee that make use of Wireless Sensor between the controller and user section.
Keywords*—Home Automation Systems (HAS), Internet of Things (IoT), ZigBee, PIC microcontroller.

I. INTRODUCTION

Home automation has become a one of upcoming field that introduces various technologies for making the things easy to access and with good performance. Home automation system that allow user to control the electrical and electronic devices. Nowadays home automation plays a wide range of task accessed by internet to reduce the physical work. In the existing system well developed home automation is controlled using Wired Communication. Here we are using a Wireless Communication to control home automation to be convenient with the advanced wireless technologies such as ZigBee, PIC microcontroller in the recent past, Wireless system are used everywhere. In recent years, wireless systems like ZigBee have become more and more common in home networking. The Wireless Home Automation System (WHAS) is an integrated system to make easier for elderly and disabled people with an easy-to-use home automation system that can be fully operated based on web application. The system is constructed in a way that is easy to install, configure, run, and maintain. In addition, a strong reason why of HASs are becoming popular is because they are plenty of attractive features for the disabled people to control devices easier. In this paper the home automation system is mainly used for the disabled people to control the electrical and Electronic devices. The devices in the house may be connected to a mobile network to gain the access of those devices and may also allow remote access through internet. The users can easily access the android application by sampling tapping the buttons present on the touch screen of android device. This method is very much useful for the persons who are physically disabled and can't move on their own to the switches to turn on the appliances.

II. PROBLEM DEFINITION

Home automation system using mobile application accesses the smart things which have the electronic devices equipped with Bluetooth. The distance between the devices and the application range is small. The development cost will be higher while the same application is implemented and maintained on mobile platform. The main objective of this paper is to implement a home automation system using IoT that is used to controlling home appliances through an easy manageable web interface. The proposed system is a home automation system that interconnects the wireless sensor between the controller and user section using ZigBee. Either keypad control or IR remote control is present to control the home appliance.

III. EXISTING SYSTEM

In the web application, a specific language consisting of a group of BT communication action XML tags that define the required Bluetooth communication actions. . In existing system, the home appliance is control only keypad or IR remote. In the web application a specific language consisting of a group of BT communication action XML tags that define the required Bluetooth communication actions. The Smartphone communicates with the smart object using the procedure of the processed Bluetooth communication action XML tags.

IV. PROPOSED SYSTEM

A. Overview

The proposed system specifies a home automation system using ZigBee. Automation system can be accessed from the web browser

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of any local pc or mobile device which connected to the internet with suitable web browser. Using ZigBee transmission and receiving process occur for the automation system. The transmission process begins the input from the mobile or pc through web application and the receiver section ZigBee RX receives the information process the required output.

In this paper microcontroller is implemented in wireless home automation system (HAS). After creating a wireless connection the system implemented a transmitter and receiver for establishing ZigBee connection. As wireless technology is developing day by day, so several different connections are introduced such as Bluetooth, WIFI, ZIGBEE and GSM in this connections have their unique specifications. Among the above mentioned technologies, ZigBee is chosen for home automation system.

B. System Overview

The overall structure of home automation system can be divided into two parts wireless terminal and appliances control terminal parts which consists of various components for communicating with each other. Then system is directly connected to the electrical and electronic devices present in the home such as fan, light. The device consists of the microcontroller unit which is connected to the ZigBee module using the RS232 communication protocol. This input command is sent to controller and sent out via ZigBee transmitter to control purpose. The control unit contains the receiver part that receives the command from the ZigBee transmitter and the microcontroller is used to control the homes appliances via relay unit.

C. Hardware Design of the System

The central processing unit for the system is emerged using the PIC 16F877A for both transmission and receiver. This controller has better performance and efficiency with serial ports. It is programmed using the embedded c program for control and giving commands through the ZigBee communication.PIC microcontroller contains two serial communications ports that enable us to connect the two peripherals that can communicate through the RS 232 communication. At the receiver unit connect the ZigBee receiver (RX) module for controlling and communication purposes. Hence the overall system integrates all the modules via wireless communication like ZigBee technology.

1) *ZigBee Protocol:* ZigBee protocol is one of the communication protocols that are proposed in this system. This protocol provide 250 kbps as maximum baud rate but we can use up to 115200 bps was used for sending and receiving as this was the highest speed. It is a radio frequency (RF) communications standard based on 802.15.4. Installation overhead is eliminated in this proposed system as we use the wireless communication for control the appliances. The ZigBee standard can communicate with 250kbps data rate, but 40 kbps can meet the requirements of most control systems, it is sufficient for controlling most home automation devices .

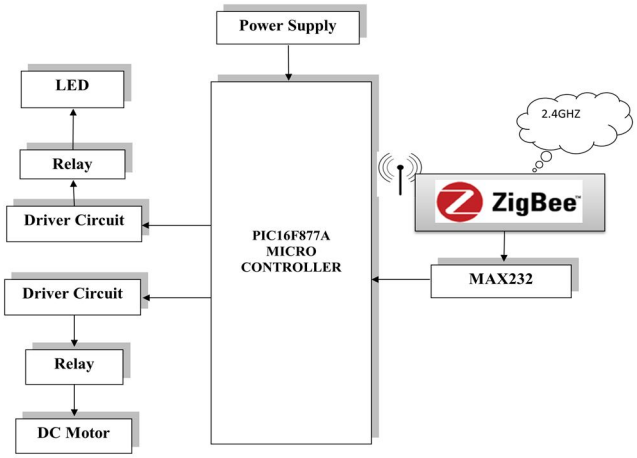

Fig. 1.Block Diagram of receiver unit

2) *ZigBee Key Features:*

Low Power
Robust
Mesh Networking

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Interoperability

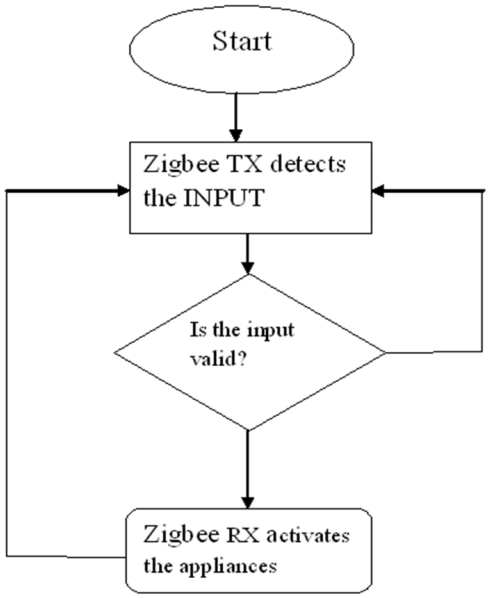
D. Software Design Of The System

HTML is a format that tells a computer how to display a web page. The documents themselves are plain text files with special "tags" or codes that a web browser uses to interpret and display information on your computer screen. HTML stands for Hyper Text Markup Language; an HTML file is a text file containing small markup tags. The markup tags tell the Web browser how to display the page. An HTML files must have an html or html file extension.

As the PIC microcontroller is used as the central processing unit of the system, we can write the program for the IC in embedded C programming language. The various software tools for development are the following:

1) *Mplab IDE:* Microchip IDE is called MPLAB IDE; Mplab ide is a software program that runs on your pc to provide a development environment for your embedded system design.
2) *Proteus simulation software:* Proteus 8 is best simulation software for various designs with microcontroller. It is mainly popular because of availability of almost all microcontrollers in it. The main theme of the proteus 8 release is integration. Development has therefore been focused on taking the various discrete parts of an electronic design and coupling them together to achieve a better workflow The software is developed in modules and integrated for over all implementation of the system.
3) *ZigBee Communication*
   a) Serial communication registers are initialized
   b) Transmit the data serially through the ZigBee module by placing the data in TXREG register.
   c) At the receiver side, received the data through RCREG register and store in a separate memory location.
   d) Turn ON/OFF the relay depending on the received data.

Below diagram illustrates the sequence of activities in the wireless home automation system. Using web application the device sent the command to ZigBee Tx .It transmit the signal to ZigBee Rx and receiver section detects the signal, process the command which activate the appliances.



V. RESULT AND DISCUSSION

In this paper we present a result of experimental to control the home appliances using web application. In web application, we have to control the home appliances by clicking the respective button in the web page, then it sent the signal to ZigBee Tx and ZigBee transmit the signal to receiver section. The receiver section validates the system and enables the home appliances respectively. Then it process the command to controller its enable the connection to the respective driver circuit and it process the relay to start/on the home appliances

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After establishing the connection the corresponding appliances will response to the appropriate process and it get controlled whether if it is ON the ZigBee Rx section sent the signal to ZigBee transceiver section and it process to the web application dynamically performed respectively.

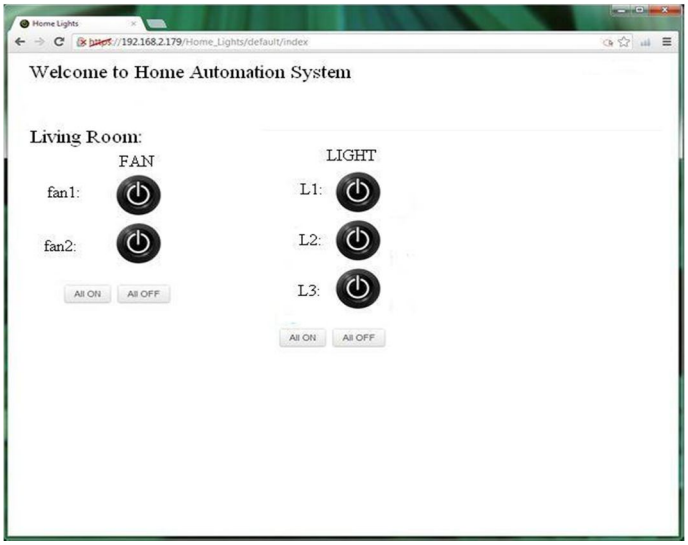

Fig.2. User interface of the web page

In this graph, the CPU time spent and the memory which is used is referred to analyze the application. It does not include the ZigBee transceiver. In the existing system the OS user service called Bluetooth share. By using this Bluetooth share their cause some problem.

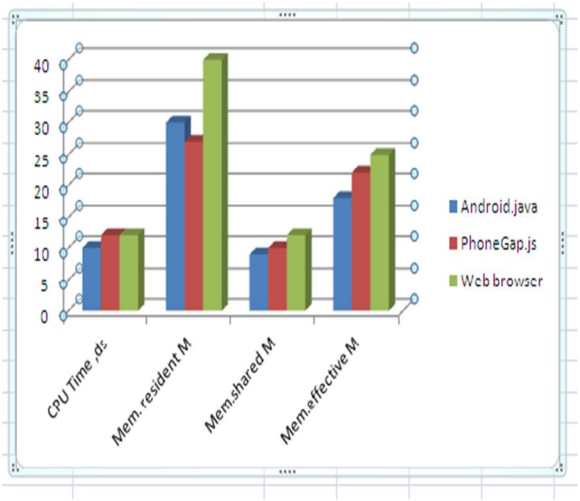

Fig.3. Performance evaluation with ZigBee communication.

Fig.3. Shows the web browser will be easy for controlling the home appliances. In this graph the comparison of existing and proposed system for the web browser is easy for communication rather than the other application oriented devices.

VI. CONCLUSIONS

The home automation using Internet of Things has been done to reduce physical work by connecting home appliances to it and the appliances were successfully controlled remotely through internet by web application. A home automation system based on web application was built and implemented. The system focus on elderly and disabled people. The prototype developed can control electrical devices in a home or office. The system implements the wireless network using ZigBee modules for their efficiency and low power consumption. These processes were designed by MPLAB compiler and Proteus for preliminary test results.

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REFERENCES

[1] Jordan Pascual Espada, Vicente Garcia Diaz, Ruben Gonzalez Crespo, Oscar Sanjuan Martinez, B. Cristina Pelayo G-Bustelo, Juan Manuel Cueva Lovelle, Using extended web technologies to develop Bluetooth multi-platform mobile applications for interact with smart things, Information Fusion 21 (2013), pp.30–41.

[2] V. Sathya Narayanan, S. Gayathri, Design of Wireless Home automation and security system using PIC Microcontroller, International Journal of Computer Applications in Engineering Sciences in: National Conference on Information and Communication (NCIC'13), Volume III, Special Issue, August 2013.

[3] S.Benjamin Arul, Wireless Home Automation System Using ZigBee, International Journal of Scientific & Engineering Research, Volume 5, Issue 12, December-2014 ISSN 2229-5518.

[4] Kallakunta. Ravi Kumar, Shaik Akbar, Android Application Based Real Time Home Automation, Indian Journal Of Applied Research,(Volume: 4 | Issue: 7 | July 2014 | ISSN - 2249-555X).

[5] Vinay sagar K.N, Kusuma S.M, Home Automation Using Internet of Things, International Research Journal of Engineering and Technology (IRJET), Volume: 02 Issue: 03 | June-2015 www.irjet.net, **(**e-ISSN: 2395 -0056 p-ISSN: 2395-0072).

[6] Armando Roy Delgado, Rich Picking and Vic Grout, Remote-Controlled Home Automation Systems with Different Network Technologies, Centre for Applied Internet Research (CAIR), University of Wales, NEWI, Wrexham, UK. {a.delgado|r.picking||v.grout}@newi.ac.uk.

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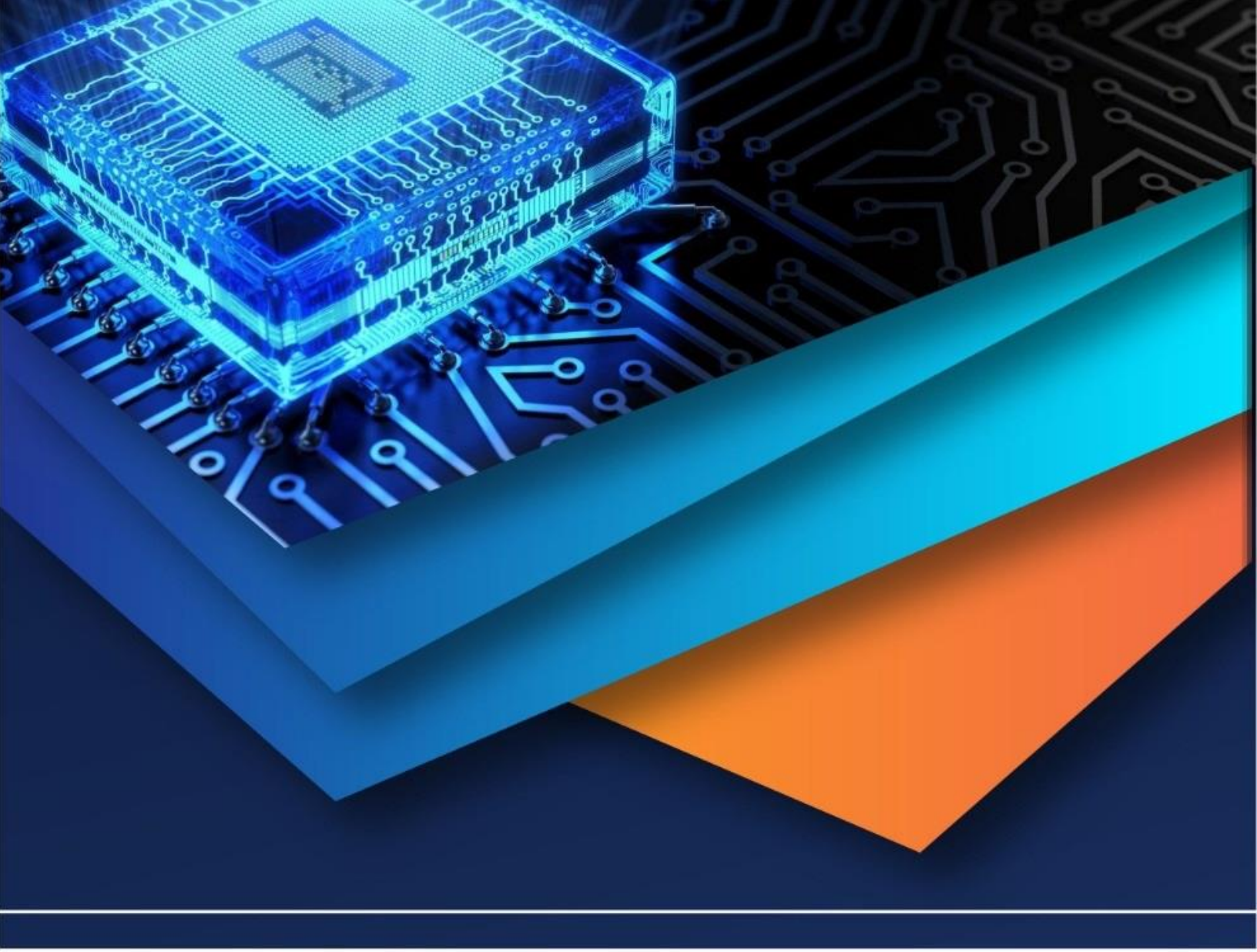

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