SMART HOME AUTOMATION SYSTEM USING IOT

Prof. Sonal Wasekar

#**Pratiksha Indurkar 1,*Karishma Sakhare2,*Sahil Dhone3,**
*Suchika Awachat4 ,*Pallavi Dongre5#

Department Of Computer Science And Engineering ,Nagpur Institute
Of Technology ,RTMNU Nagpur, Maharashtra, India

Keywords: ZigBee, Smart Home, Home Automation.

Abstract- This provides an effective and flexible home control and monitoring system with the aid of an integrated micro-web server with IP connectivity for access to and control of equipment and devices remotely using. The proposed system does not require a dedicated server PC with respect to similar systems and offers a new communication protocol for monitoring and controlling the home environment with more than just switching functionality. Smart home interfaces and device definitions to ensure interoperability between ZigBee devices from various manufacturers of electrical equipment, meters and Smart Energy enables products to allow manufactured. We introduced the proposed home energy control systems design intelligent services for users

1. Introduction

Intelligent management of the power system, facilitate the joint use the current and minimizes power loss during transmission and power consumption is highlighted by the global community, academic institutions, and State administration. To gain full utility and customer protection dimensions, the idea of a smart grid enabling technologies used in In recent years, attracting a great deal of attention in the energy industry and academia Such studies. With continued growth in popularity and functionality of mobile devices, demand advanced mobile applications widespread human life continue to grow. The use of Web Services is an open and interoperable method for providing remote access service or applications can communicate with each other. An attractive market for home.

2. Automation and network of busy families and individuals will be physical Limitations. electronics prototyping platform based on Flexible, easy-to-use hardware and software. The microcontroller Board of Based on the AT megha16. The Low-voltage

switching relays were used to integrate Devices with Controller is to show switching functionality. The LM35 temperature Sensor is used to control a smart home environment.

3. A supervisory control system Intranet, low cost and high performance can react The ZigBee technology. An end node, the node sends data to the coordinator, and the coordinator Hub sends the data back to the terminal end of the loop. Since all devices have their own IP Address based on IPv6, they can be directly connected to an external network. So, all smart devices It can not only through the handheld remote control device to the central and local home, but can also be controlled remote computer control through the introduction of home Internet Gateway machine.

1. LITERATURE SURVEY

Smart Home is applied in order to provide comfort, energy efficiency and better security. Smart Home System is still rarely used in Indonesia because of the cost and the difficulty of getting the device. The objective of this paper is to offer a Small Smart Home System designed and created by utilizing WLAN network based on microcontroller. The system is able to monitor and control lights, room temperature, alarms and other household appliances. Results from testing the system show proper control and control monitoring functions can be performed from a device connected to a network that supports HTML5.

[1] Smart home network excite new possibilities. We proposed a new smart home energy management system based on ZigBee sensor networks to make home networks more intelligent and automatic . The role of the SHEMS for managing energy usage is a crucial factor in addressing the home's growing energy concerns. The Smart Energy initiative serves these needs by providing an adoptable and sustainable experience by linking new and useful digital technologies to the needs of consumers. By empowering consumers with near real-time information of their energy usage through an array of products and services, the intent is to help consumers use energy more efficiently and also to minimize their personal impact on the environment.

We implement the proposed system and develop related hardware and software. We suggest new SHEMS based on the proposed system. We expect that our work contributes towards the development of ubiquitous home networks. As a part of future work, we will apply IEEE 802.15.4 standard technology in our home.

[2] Wireless sensor networks (WSNs) and power line communications (PLCs) are used in this work to implement a smart home control network.

Internal Communication Every data transmit between ZigBee networks can be communicated by each other, so people in any room can control the other room's devices. The query flow-work of home appliance is shown as follows: Appliance receives information from home gateway by ZigBee module and detects the household appliance's status, and then corresponding status will be transmitted to the home gateway by ZigBee module. If all appliances work properly, home gateway stores appliances' status. If not, home gateway reports an error message to supplier.

Hardware Implementation and Home Automation Devices

The Atlength 16 and Zigbee were used to implement the micro server for the Home gateway in figure

[3] Home gateway connects to the Internet a. The microcontroller that uses ATMEGA 16, an Atmel AVR processor which can be programmed by the computer in C language via USB port.

LM35 temperature sensor was used for temperature monitoring while a non-invasive 30A current sensor was utilized for power monitoring. Used to successfully integrate the current sensor with the Atmegha 16. The hardware architecture presented is flexible and allows other home appliances and devices to be seamlessly integrated with minimal changes.

Energy Management

Consumer-side energy management is a part of the smart grid program. The customer can control the power consumption according to the power line's load, Smart-grid enabled smart homes with time-of-use metering and energy management devices and tools help consumers monitor, manage and control energy usage, while helping them optimize performance and reduce energy losses from major appliances, heating, cooling and lighting. With a smart home energy management system, consumers can manage energy usage and costs throughout the day, without compromising their lifestyles. The network architecture of SHEM system.

2. SYSTEM DESIGN
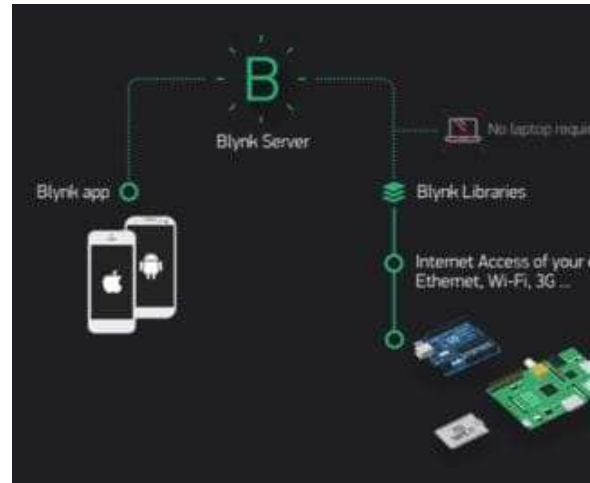
In the proposed design, a low cost smart home system for remotely controlling and monitoring the smart home environment is presented. An overview of the proposed system architecture is shown The sensors and actuators/relays are directly interfaced to the main controller.

.XBEE ZIGBEE

ZigBee is an open global standard built on the IEEE 802.15.4 MAC/PHY. ZigBee defines a network layer above the 802.15.4 layers to support advanced mesh routing capabilities. The ZigBee specification is developed by a growing consortium of companies that make up the ZigBee Alliance. The Alliance is made up of over 300 members, including semiconductor, module, stack, andsoftware developers in figure. XBee Series 2The difference between Series 1 (S1) and Series 2 (S2) isthat the latter enhances the power output of the antenna to 2mW. S2 also enhances the data protocol of the XBee module.S2 is similar to S1 in enabling simple and easy communication between microcontrollers and supporting point-to-point and point-to-multipoint communication.

3. SOFTWARE DESIGN

Today in the headway of Automation innovation, life is getting simpler and less demanding in all spheres. Home automation is a modern technology that modifies your home to perform different sets of task automatically. Today Automatic frameworks are being favored over manual frameworks. No wonders, home automation in India is already the buzz word, especially as the wave of second generation home owners grows, they want more than shelter, water, and electricity. The first and most obvious advantage of Smart Homes is comfort and convenience, as more gadgets can deal with more operations (lighting, temperature, and so on) which in turn frees up the resident to perform other tasks. Smart homes filled with connected products are loaded with possibilities to make our lives easier, more convenient, and more comfortable. There is no shortage of possibilities for smart home IoT devices as home automation seems to be the wave of the future. The requirement for Office and Home automation arises due to the advent of IoT, in a big way in homes and office space. The smart home/office gadgets interact, seamlessly and securely; control, monitor and improve accessibility, from anywhere across the globe. These smart automation devices happen to have an interface with IoT. IT automation will be the key to bridging the gap between human limitations and technology's capabilities. With automation, data can be instantly collected and seamlessly passed between devices as it's simultaneously analyzed. Home automation is an appealing context for the Internet of Things (IoT), by connecting the IP gateway directly to the Internet or through a home/residential gateway; this system can be managed remotely using a PC, Smart phone, Tablet or other devices

The IoT based Home Automation will enable the user to use a Home Automation System based on Internet of Things (IoT). The modern homes are automated through the internet and the home appliances are controlled. The user commands over the internet will be obtained by the Wi-Fi modems. The Microcontroller has an interface with this modem. The system status is displayed through the LCD display, along with the system data. This is a typical IoT based Home Automation system, for controlling all your home appliances. The smart home market is taking off as IoT device prices come down and the general public comes to understand the benefits of these products. And from smart homes, the next logical step is smart cities, which would take the IoT to the next level. And yet, smart homes are just one small part of our daily lives that the Internet of Things will transform in the coming years.

We have already witnessed some early commercial success in the IoT industry where today, everyone is talking about Internet of Things which is the "next big" thing in the world of technology. The prospect of 30 billion objects connected to the Internet by the year 2020 is staggering, as the opportunities for new lines of service and new business models grow out of this realm. IoT is based on the inclusion of devices in the world of connected environments. The devices are embedded and connected, based on a unique identity. The IoT devices in Home Automation have the maximum applications in energy. The home heating devices are able to control the temperature with the devices like laptops, tablets or smart phones and all of these appliances, systems, and

devices contain sensors that connect them to a network. This is where IoT comes into place, and makes it such an integral part of the home automation. With the help of IoT technology, you can control devices as and when you want.

4. WORKING

1. The function of the relay module as normal switch "ON" and "OFF" will turn a lamp. An infrared detection system consists of infrared sensor as an input, while the relay module as starting Atmegh 16. The XBee is a feature-rich RF module for use on a wireless sensor network. The IEEE 802.15.4 protocol greatly reduces the work of the programming f ensuring data communications. The XBee has many other features for use in a WSN beyond its networking ability. Now that you have a better understanding about the XBee's features and uses, we will look at means of interfacing the RF Zigbee to your microcontroller and showing examples of use.

2. The access point consists of that can connect to the Internet and transmission of data to hosting server . website. This smart switch device, the lamp in a house controlled manually with the infrared switches detection system or wirelessly with C# App. You might be wondering why you should go through the trouble of building a native client when the web application we wrote can be accessed by the web browser. Well, if all you wanted to do was toggle light switches on and off, then I would say you don't need a native client.

Building the Solution

In order for X10-managed lights and appliances to be remotely controlled, we are going to assemble a variety of separate technologies and use them in a unified way. We will do the following:

1. Test the X10 computer interface and modules with the application.

2. Create a s application that provides a C#- based front end.

3. Create an Server application that will communicate with the Rails application, turning the light on and off via a native onscreen toggle switch control.

Figure 4.3 Hardware Implementaion

6. CONCLUSION

In this paper we propose a new architecture for the monitoring and control system that uses a flexible home-based at a reasonable price and implemented by XBee wireless transceiver The proposed architecture is used in a quiet based web services in an interoperable application layer for communication between the remote user and the home device. All , the Wi-Fi

connection is the support built, the home access device to control.

7.SCOPE OF FUTURE ENCHANCEMENT

This application can be further developed into system with the following enhancements:

1. Bill functionality can be added to the home automation system which can predict bill of any selected period.

2.Gas leakage and light dimming functionality can also be added in near future.

ACKNOWLEDGEMENT

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