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HOME AUTOMATION USING ZIGBEE

B. Sai Prasanna[1], Thota Ravi Theja[2]
Assistant Professor[1,2]
Department of ECE
MREC

***Abstract*-**In recent years, the home environment has seen a rapid introduction of network enabled digital technology. This technology offers new and exciting opportunities to increase the connectivity of devices within the home for the purpose of home automation. Moreover, with the rapid expansion of the Internet, there is the added potential for the remote control and monitoring of such network enabled devices. However, the adoption of home automation systems has been slow. This paper identifies the reasons for this slow adoption and evaluates the potential of ZigBee for addressing these problems through the design and implementation of a flexible home automation architecture.

***Index Terms*-**Home automation,Zigbee,Internet,Remotemonitoring,Switches.

I. INTRODUCTION

In recent years, the home environment has seen a rapid introduction of network enabled digital technology. This technology offers new and exciting opportunities to increase the connectivity of devices within the home for the purpose of home automation. Moreover, with the rapid expansion of the Internet, there is the added potential for the remote control and monitoring of such network enabled devices. However, the adoption of home automation systems has been slow. This paper identifies the reasons for this slow adoption and evaluates the potential of ZigBee for addressing these problems through the design and implementation of a flexible home automation architecture. A ZigBee based home automation system and Wi-Fi network are integrated through a common home gateway.In recent years, the home environment has seen a rapid introduction of network enabled digital technology. This technology offers new and exciting opportunities to increase the connectivity of devices within the home for the purpose of home automation. Moreover, with the rapid expansion of the Internet, there is the added potential for the remote control and monitoring of such network enabled devices. However, the adoption of home automation systems has been slow. This paper identifies the reasons for this slow adoption and evaluates the potential of ZigBee for addressing these problems through the design and implementation of a flexible home automation architecture. A ZigBee based home automation system and Wi-Fi network are integrated through a common home gateway.

The adoption of home automation technology by consumers has been limited. We propose that, from the home automation domain analysis, the problems limiting wide spread consumer adoption can be grouped into five general categories. Firstly, complex and expensive architecture: the existing systems architectures generally incorporate a personal computer for the purposes of network management and provision of remote access. This adds additional complexity to the system, hence increasing the overall fiscal expense.

II.EXISTING WORK OR LITERATURE SURVE

A ZigBee-Based Home Automation System 425 Zigbee Home Automation Architecture. The use of Wi-Fi offers several advantages over alternative technologies. The Wi-Fi standard is more established in homes in the UK than alternatives such as Bluetooth as a wireless home networking technology. The result is less equipment expense for the consumer, and the use of a technology users are familiar with. Network Coexistence Heterogeneous and homogenous home networks may coexist with each other in the same environment. The problem of interference between these networks increases as more and more standards emerge which use the same communication mediums. The interference problems between the possible standards have been investigated,researched the coexistence of Zigbee, Bluetooth and Wi-Fi. The three protocols use the same 2.4 GHz ISM band. It was found that Zigbee interference has an insignificant effect on Wi-Fi throughput. The effect of Wi-Fi on Zigbee throughput is a 10% reduction in throughput, which provides an operational solution. The experiment was repeated using Wi-Fi and Bluetooth. The results showed a significant reduction in Wi-Fi throughput and Bluetooth throughput. It can be concluded that the use

of the unlicensed part of the wireless spectrum by Zigbee causes interference problems. Technologies such as Bluetooth, microwave ovens and cordless telephones can cause interference with Zigbee [11]. However, Zigbee and Wi-Fi can exist together with less interference problems than alternative technologies

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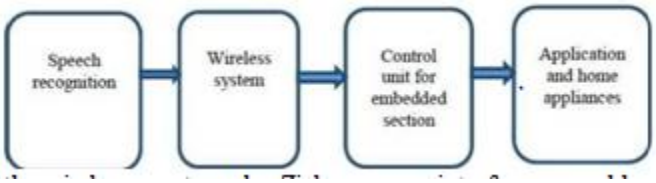
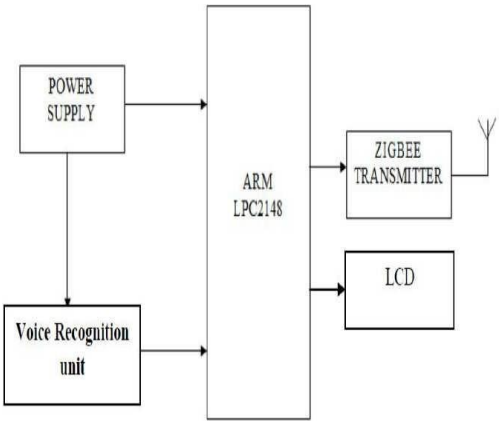
currently available, hence offering the best combination available for use in our purposed architecture.



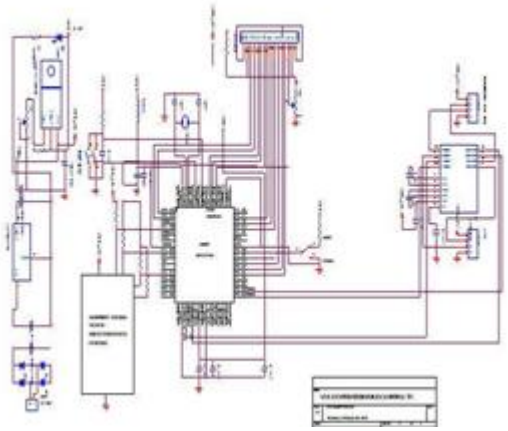
Home Automation Devices To demonstrate the feasibility and effectiveness of the proposed system three devices; a light switch, radiator valve, and safety sensor, were developed. These devices are depicted Radiator Valve: A prototype automatic radiator valve was developed and integrated with a ZigBee microcontroller. The valve can be manually controlled as are conventional valves, but also remotely monitored and controlled. Safety Sensor: The safety sensor has special characteristics of interest. For instance, unlike most devices, the safety sensor has to continuously monitor its environment and provide feedback. This reduces the time the device can operate in sleep mode, hence considerably reducing the battery life.

III. PROPOSED WORK

Thesystemhasbeendesignedconnectingvariouscomponents as generalized in Fig 1) base station 2) remotestation 3) voice control unit 4) ARM 5) ZIGBEE 6) powersupplyregulator



FigstandmostpartinsystemdesignisBaseStation.BSwouldfunction with+5V.Voltagewouldbeusedasoperatingvoltage for all of circuit elements in BS. Microphone in BSwould be gathering up audio in close range. Audio signal frommicrophonewouldbeinputintoHM2007speechrecognitionRSOperatesin+5v.MicrocontrollerinRSreceivescommands through microcontroller using Zigbee protocoland decode them using and update to relay switch. Sensorvaluesare updatedonboard.Voice recognition scheme is a wholly gathered and informaltopracticeprogrammablevoiceidentificationcircuit.Flexibleinsenseusercanaddnew-wordswhicharerequiredtobeidentified.Circuitpanelpermitsusertotrywithnumerousfeaturesofvoiceidentificationtechnology.Takes8bitinformationthatcouldbeinterfacedwithseveralcontrollercircuitsforadditionalexpansion.



Also obtainable in 48-pin PDIP. Keypad and digital displayare used to interconnect with program and HM2007 chip.keypad is make upof 12 generally open fleeting interactionbuttons.74LS3738-bitregistersattribute3-stateoutputsdesignedpreciselyforpouringextremelycapacitiveorcomparatively low-resistance load. High-impedance 3-stateand amplified extraordinary-logic-close effort deliver theserecordswithcompetenceofbeinglinkedstraighttoandpouring busshapesinbus-preparedsystemdeprivedofnecessityfor lineor pull-upmechanisms.

IC7448isBCDto7–segmentsharedcathodeIC.Amicrophone is associated straight with pin 15(MICIN) ofHM2007 that is visible below. On system voice is educatedfirstandacceptedasacommandisspecifiedfrommicrophone. Board permits user to try with many aspects ofvoiceidentificationtechnology.

IV. RESULTS AND DISCUSSION

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Tocontrolhouseholdappliancesvoicecommandsgiventothe system through the microphone which are display on LCDandthisvoicesignalsareprocessedinHM2007andconvertedin toabinarysignalandtransmitsittothemicrocontroller. The microcontroller processes the data andthe voice commands either to on or off circuit house holdapplications

Sr. No.	Command	Result
1.	01	Device1(Light) :ON
2.	02	Device1(Light):OFF

V.CONCLUSION

ZigBee can be considered as the most suitable technology for Home Automation compared to other existing technologies like WiFi, GSM Bluetooth etc. It is low cost, very low power consumption, 868MHz, 915MHz and 2.4GHz frequency range cover etc. There are still some challenges of ZigBee based system like resources constraint- sensors (node) used in system, limited range, interference with other wireless system, technological limitation depend on IEEE 802.15.4 standard.ThisZigBee based system is used for remote controlling and monitoring of various home loads/appliances. The ultimate objective is efficient power utilization through real time power level indicator with the help of a PC-based GUI application.AsuccessfulIEEE802.15.4zigbeeprotocolbasedWHA Ssystem hasbeenimplementedandusedinbettersystemdevelopment. The system has found to be best and can be usedin large scale at college level. The current work has beenimplemented at electronics department and features to beproductwhichisapplicableanduseful

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