Smart Home System Using Appropriate Architecture for IoT Devices

Elizabeth[1] and M V Satyanarayana[2]

[1]M.Tech student, DCN, Dept. of ECE, GSSSIETW, Mysuru.
[2]HOD,Dept. of ECE, GSSSIETW, Mysuru.

*Corresponding Email : elizabeth071024@gmail.com

ABSTRACT

Internet of things heralds a vision of the future internet where connecting physical things, through a system will give them a chance to take a dynamic part in the internet, trading about themselves and their environment. This will give immediate access to data about the physical world and the objects in its prompting creative services and expansion in proficiency and efficiency. Interoperability is one of the major challenges in the realization of IOT. The present system being proposed uses appropriate design which will overcome most of the obstacles in the process of large scale expansion of IOT. It specifically addresses heterogeneity of IOT devices, and enables seamless addition of new devices across applications and also this system provides security and protection

Keywords: Internet, Interoperability, IOT.

INTRODUCTION

In the recent years, Internet has become the most important thing in daily life. Around two billion users around the world use Internet for exchanging emails, using social networking applications, sharing large amount of data, playing games and many other things. As the use of Internet is growing day-by-day, another big area is emerging to use Internet as a global platform for allowing the machines and smart objects to communicate, compute and coordinate, called Internet of things (IoT). Fig1 shows the Evolution of internet in 5 phases and fig2 shows the definition of internet of things.

Distributed network architecture: Distributed Network Architecture is the arrangement of devices in a network that are capable of working in both jointly and independently as required.

The benefits of Distributed Network Architecture are scalability, efficiency, cost and reliability.

Home automation:A Home Automation system connects various electrical devices in the house to a control unit. This permits the person to control them at the touch of a button from inside and outside the home. Home Automation Systems increase the level of comfort, security and energy management. It also has the added advantage of controlling the devices through smart phones to allow full control of any connected component.

Home automation may include control of lighting, heating, ventilation, air conditioning, security locks of gates and doors and other systems, to provide improved convenience, comfort, energy efficiency and security.

LITERATURE SURVEY

1.L.Tan *et al* - The main communication form on the Internet is human-human. But it is foreseeable that in a near soon that any object will have a unique way of identification and can be addressed so that every object can be connected. The Internet will become to the Internet of Things. The communicate forms will expand from human-human to human-human, human-thing and thing-thing (also called M2M).This will bring a new ubiquitous computing and

communication era and change people's life extremely. Radio Frequency Identification techniques (RFID) and related identification technologies will be the cornerstones of the upcoming Internet of Things (IOT).

2.Miao Wu- In this paper different types of architectures are proposed. Three-layer structure has certain significance to understand technical architecture of the Internet of Things at the initial stage of its development, but it cannot completely explain its structure and the connotation. So five-layer architecture can help scholars and developers to better understand the Internet of Things.

3.Rozita T- This paper investigates the potential of 'Full Home Control', which is the aim of the Home Automation Systems in near future. The analysis and implementation of the home automation technology using Global System for Mobile Communication (GSM) modem to control home appliances such as light, conditional system, and security system via Short Message Service (SMS) text messages is presented in this paper.

4.M Zhang- This paper proposes IoT architectural model which introduces a more generic IoT architecture by integrating both the RFID and WSN and Web Service infrastructures.

DESIGN METHODOLOGY

The microcontroller used is 18F46K22. Diverse peripherals are connected with microcontroller using IO line and correspondence port. LCD is connected with microcontroller to display information like, temperature, sensor status etc. Temperature sensor used is DS1820B which is a modernized, one wire sensor. Microcontroller can send "Start" summon to temperature sensor then temperature sensor converts the temperature information. Once the change is done it sends a signal to the microcontroller saying completed. Microcontroller gets the changed over data from the temperature sensor and showcases it on LCD.

Temperature sensor is used for room temperature to control fan as a close circle and another temperature sensor is used to control the peltier. PIR advancement sensor recognizes living things which creates warm infrared radiation and it gives the information to the microcontroller saying some advancement is distinguished.

Microcontroller sends the SOS message to the relating customer by method for GSM.

LPG sensor recognizes spillage of isobutene, propane and liquid petroleum gas to keep any unsafe impact in view of spillage. Right when spillage is recognized it sounds an alert to caution the all inclusive community and sends a SOS message to the relating customer.

FIRE sensor perceives close warm infrared detectable fire and gives the information to the microcontroller. Right when fire is remembered it sounds a caution and sends the message to the customer.

Solid State Relay is a sensitive switch to turn ON and OFF electrical devices like light, fan etc

Max 232 is a voltage converter amidst microcontroller and Wi-Fi or GSM. GSM takes a AT requests which can send and get SMS. SIM900A GSM is a triband module which can work at 3 one of a kind frequencies.

Wi-Fi ESP8266 is a 802.11.b/g/n position Wi-Fi. Here Wi-Fi is used to send a graphical information regarding the sensor status and control information to the user

TEST RESULTS

The webpage for controlling the fan and light according to the status of the temperature sensor is shown in fig4. The webpage is created using html coding.

Lcd used to display the temperature status is shown in fig5. The temperature sensor and lcd is connected to the microcontroller. The status of the sensor is visible on lcd. The coding used for this is mikroC.

CONCLUSIONS

Nowadays due to busy lifestyle people are not able to concentrate on household operations which may lead in damages, theft or wastage of the resources. So it is required to use Internet to switch on and off, several household devices, from wherever we are, to save electrical energy, for convenience and for comfort using specific protocol and architecture.

REFERENCES

[1] C. Perera *et al*.," Context Aware Computing for The Internet of Things: A Survey," ieee communications surveys & tutorials, vol. 16, no. 1, first quarter 2014, pp 414 – 417.

[2] L.Tan *et al.*,"Future Internet: The Internet of Things" 2010 3rd International Conference on Advanced Computer Theory and Engineering(ICACTE), pp 376 – 380.

[3] Miao Wu *et al*.,"Research on the architecture of Internet of things,"2010 3rd International Conference on Advanced Computer Theory and Engineering(ICACTE), pp 484 – 487.

[4] Omar.S *et.al*.," Towards Internet of Things: Survey and Future Vision,"International Journal of Computer Networks (IJCN), Volume (5) : Issue (1) : 2013, pp 1 – 3.

[5] A. P. Castellani *et al.*, "Architecture and protocols for the Internet of Things: A case study," in Proc. 8th IEEE Int. Conf. Pervasive Comput.Commun. Workshops (PERCOM), 2010, pp. 678–683.

[6] M. Zhang *et al*., "Architecture of Internet of Things and its Key Technology Integration Based-on RFID," 2012 Fifth International Symposium on Computational Intelligence and Design, pp 294 - 297.

[7] Rozita. T *et al.,* "Smart GSM Based Home Automation System," 2013 IEEE Conference on Systems, Process & Control (ICSPC2013), December 2013, Kuala Lumpur, Malaysia, pp 306 - 309.

[8] Niksa. S *et al.,* "Smart Home Automation System for Energy Efficient Housing," MIPRO 2014, May 2014, Opatija, Croatia, pp 166 – 170.
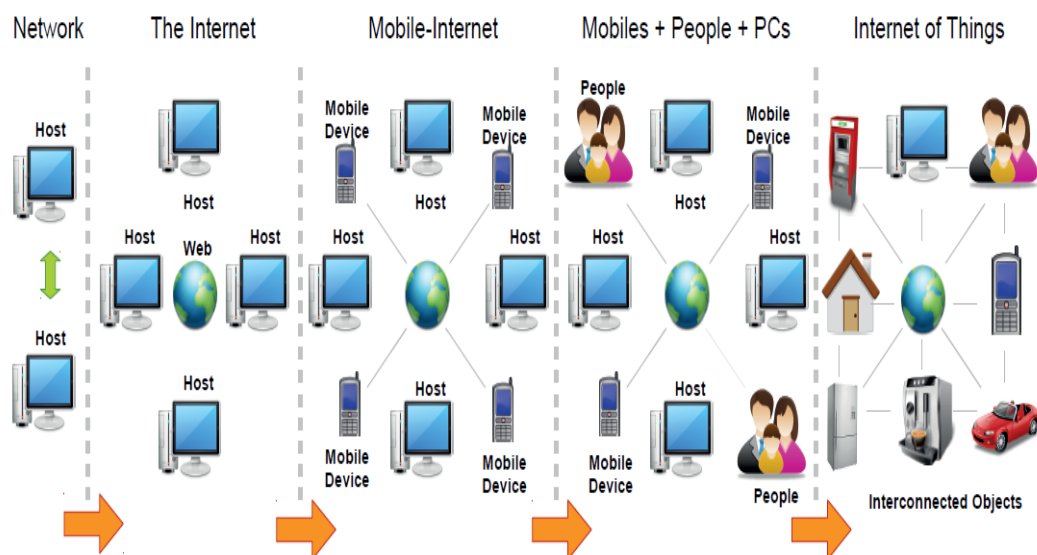
Fig1: Evolution of internet in 5 phases
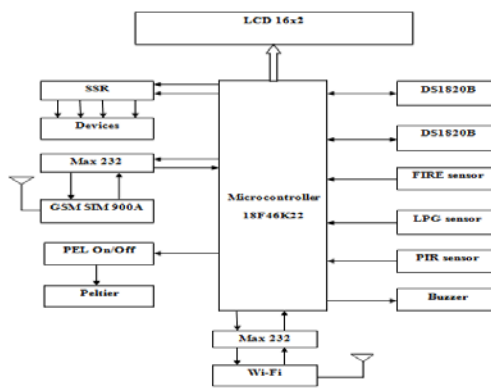
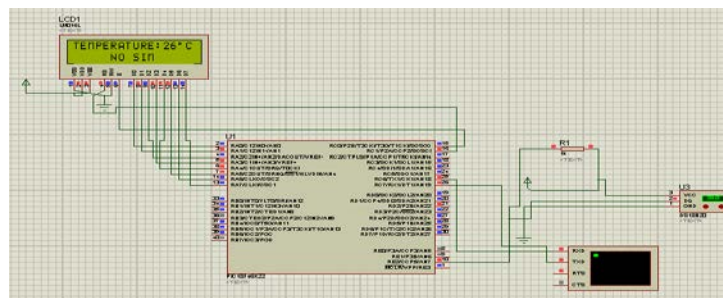**Fig 2 : IOT definition**

Fig3: block diagram

Fig4: web page

Fig5: simulation of temperature sensor