

# The Internet of Thing based Smart Home System

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## Abstract:

In last few years, technology has day by day in a grown at high speed. Also human live have be more attracted to mobile application and electronic devices. Just, it has thus demo operated led to develop a smart home system. This paper created to Smart Home enable to any user operated all electronics device from anywhere. This system are used three hardware component : An Arduino based on microcontroller for connecting the application with help of Ethernet shield and it's control to all electrical devices to connected a Relay, second as Ethernet shield for signal transfer ,it means used to only communication between Arduino and a running Android application. In main propose to design &implantations are based on Arduino AT Mega 328 board and Tocreated newapplication connected to this board using relay. A relay active depends upon an Arduino. It's provides to command then relay actives after operated to electrical device like lamp, fan. etc... the Smart Home interacts with the Arduino via Ethernet cable, Wi-Fi. The main aim of the system develop is to very low cost and flexible, secure for smart home according to requirements. All the process control android application through but it first right access to password then process to ready either wise it not running to this project. But other the paper design &implementation of Automatics for smart home then i will include to some hardware like that different types of sensor, its Automatics control to your smart home. It is design only main purpose of saving time, safety home; it's not manual operated to electrical devices.

## Keywords

WHAS, Android phone, Ethernet or Wi-Fi, Sensors, Relay

## 1. INTRODUCTION

In this modern develop by automation of every movement is the need of the every hour. The basic aim of any designer to implementation based on our life[1]. Smart home as know as Home Automation. A Home Automation aims of live activities of human life. Its mean actives the home application without press to switch or

conventional switch to used smart home is known as Home Automation. It used to more computerized host to control to basic home function like as light on/off, demonstrated to temperature etc...its control to manual by used android app and some time control automatics then used more sensor .An automatic control to home is some time called a Smart Home[2].



Figure 1. Smart Home Technology live Application[3]

In present day worldwide, human using to more wireless Technology. Because, wired networks are really very complicated. These using wireless technologies have effect human life in a positive manner and human day by day develop speed increases.



Figure 2. Internet of Things [4]

The internet of things to connecting to human, animal, any objective connect to same IP address through all software and hardware[5]. In creating opportunities for more direct integration between the physical world and computer-based systems, and resulting in improved efficiency, accuracy and economic benefit. when IoT is augmented

with sensors and actuators, the technology becomes an instance of the more general class of cyber-physical systems, which also encompasses technologies such as smart grids, smart homes, intelligent transportation and smart home[6,7,9].

This paper design to smart home used to both technologies: wired & wireless technology. A wired technology used for Automatics operated to all electrical device in home using by Ethernet cable, other wireless technology used to main purpose for all operated home feature from anywhere by using Wi-Fi, Bluetooth System through operated to globally. In other word, we can say that main wireless technologies used in Smart Home are internet, cloud and Bluetooth. Each technology has it more advantages and disadvantages. I also refer to deal of Bluetooth based smart home system has only devices can be connected to short range of 10m to 100m. These main disadvantages of Wireless Technology. It solves to problem used wired technology to connected device from anywhere. It is there advantages that deal design and implementation a using wireless technology based on smart home system.

### TECHNOLOGY FOR SMART HOMES

The Internet of Things refer of even growing network of physical object the features an address for internet connectivity ,and communication that occurs between these user and other internet enable device and Systems. It's also different things—implanted with hardware, programming, sensors, actuators, and system network that empower these articles to gather and trade information.IOT is connected in the advancements of different protests and additionally correspondence innovations. IOT is gathering of wide-and neighborhood, handling advancements like Bluetooth, Wi-Fi, 3G, 4G LTE and little cells help to convey productivity, security and upheaval of the quickly developing urban situations. In live IoT related advancements of examples in a complying;-

- RF-based control for Set –Top Box and CE, including Internet connectivity

Today, many no. of large operated , number of service provides and utilities has already launched to this application residential used for mange via set top- box and from there view to over Wed page ,allowing these application to subscriber the monitor their homes from globally in world via Android phone.

- Energy Management will latch on ,other application develop simultaneously

In future life, “the real smart home”, this application operated to under the same communication like Zigbee communication and different types sensor are used for

integrated to smart home that saving energy management[8].

The real smart home integrated to all application and hardware and it intelligence under it. For example, the motion sensor detected to human and its operated to all electrical devices turn on around human standing place. it control and saving to light, fan electricity etc. it same sensor used home security for alarm if someone breaks in and is moving throughout the home.

### 2. LITERATURE REVIEW

These used Wi-Fi as a medium for communication between the hardware and software component. Its main disadvantages of Bluetooth, Wi-Fi are communication between hardware and software shot area coverage. Then, its solution to this problem used to An Android based Smart Home System was developing early year.

We are discussing about how secure of Home System.

- Advanced low cost security system using sensors, Arduino and Ethernet through communication:

In This paper represented of important of home security easy measure to used programming sensor like PIR sensors, temperature & humidity sensor .Why are used to sensor for smart home , it some reason for low cost and maintains to all home. A using DSP & reading finger print which add to current installation of Security home system. This client module is communicated with host controller through wireless devices such a Bluetooth, Ethernet etc...Enables mobile phone, in case a smart home using to IoT technology[9-13].

- Home automation using Arduino UNO

In this system required to Arduino, it controller by host (android application through). As developed to new design GUI application using Android application is a communication between processing system and hardware component like response access to Arduino device, then this board again response get to relay, what is active electrical devices at time.

- Design & implementation of home system by Arduino UNO Using Android Application

The Arduino platform has become quite popular because all people are coding to Arduino IDE software using IoT base related control to electronic devices. A compare to simple microcontroller its more different structure and does not separated to hardware allow and its used to arduino IDE Software easy to new code connected in arduino device .you are easy to USB Cable connected to

your PC. It code will easy executed then making a code to C languages. A user used to application to communication Arduino and processing software how to access that using android application

### 3. PROPOSED WORK

We are represented to this paper using Android based home system and without Android, it mean you are design to demo only automatics operated electrical devices in your home then you are operated to without Android application . Android application base electrical home is operated to help of embedded system which integrated Android application. it know as operating system. Arduino base on micro-controller and Ethernet cable, Wi-Fi for the smart home. Any Android device response goes to Arduino device in which write code how to control to all electrical device at time[14].

The user ended used to mobile application control to all home Feature from globally exclusively main purpose for this paper. A unique IP address code for controlling the application is transmitted to Arduino board to get response and it is operated to E-device in home with help of Relay. But Demo consist that used to Central Processing Unit (CPU) instillation in our home, according the application, as demonstrated message of running time to operate the electrical devices. All process based on command from the user (who device are active at time) this signal sent o Arduino get to response after its operated to work like on/off device with help of Relay because relay connected to electrical device.

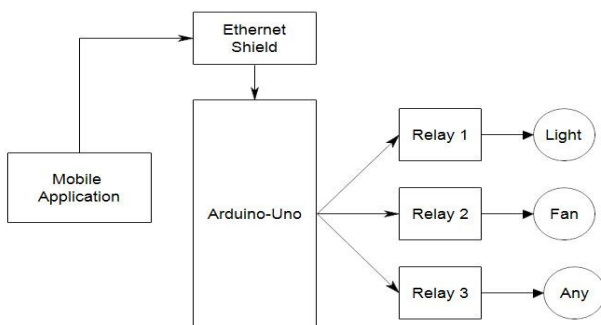


Figure 3. Basic Block diagram

As shows in Figure 3, Basic implementation set up a Consist of main three components as Arduino, Ethernet Shield, and Relay. In this paper main purpose of control to all electrical devices from anywhere using an Android Application. This paper is main goal of concerned with the Smart Home System which uses Ethernet Cable interaction between the mobile Application and Appliances under the control of the System. This paper features explanted to light on the design and implementation of the system[15, 16].

### 4. ARCHITECTURE DESIGN

In this paper how to communication between Android Application and Appliance under control the System. A Reaches to this topic represent by Flow Chart, Let's start to project, first under user name & password in Mobile Application. You are write username & password, but it not success to login Then, again write to password. If successfully to login then, the next process exclusive of view to no. of switch carry set in which chose to switch and press to key only one device then these are response get to Ethernet shield ,it work to only communication between Arduino and appliance under to control of system. The Ethernet to response come on Arduino, its control to all electrical devices with help of Relay. An Arduino again response toward to Relay, Who device active at one time? The Relay to get response of Arduino then it relay active and then, it on device like Light, Fan etc. In which command through Arduino. Finally the electrical devices are operated to successfully and this process continuous runs. As shown in figure 4, the flow chart of how work to this project and it secure to Smart Home.

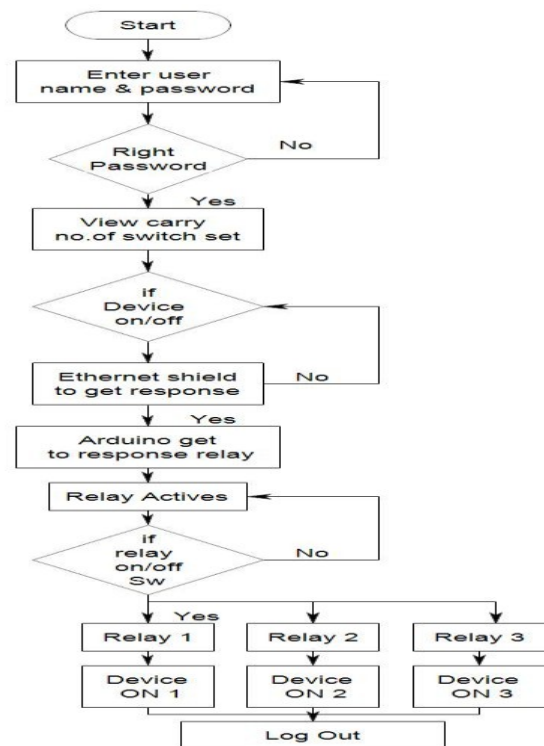


Figure 4. Architecture design

### 5. APPLICATION OF SMART HOME

6.



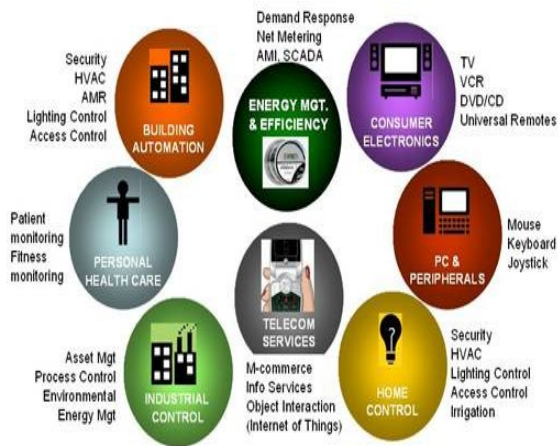


Figure 5. Different Application related to smart home

As show fig of different Application smart home used of IoT Technology , In view of live Application like security HVAC AMR Light control access control , asses process control to Environment Energy, M-commerce info service object interaction internet of things, etc.

## 7. CONCLUSION

In this paper we are studies of relates to IoT based smart home and how to access communication between application and appliance under to this system. This paper objective for secure of home system without human.

In this paper ready after of things to some parameter attaches to this project like CCTV camera for secure you home and it used it used to RF based through control to Set Top –Box .

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## 9. REFERENCE

- [1]. Atzori, hitton on internet of things related : A survey." Computer networks. (2010).
- [2]. Rajesh and moral. "Multiple application through control to all electrical devices" IJIRCCCE (2015).
- [3]. Byeongkwan Kang, Sunghoi Park, Student Member, IEEE, Tacklim Lee, and Sehyun Park. "IoT-based Monitoring System using Trilevel Context Making Model for Smart Home Services." IEEE(ICCE) (2015).
- [4]. Kelly, Sean Dieter Tebje, Nagender Kumar Suryadevara, and Subhas Chandra Mukhopadhyay. "Towards the implementation of IoT for environmental condition monitoring in homes." Sensors Journal, IEEE 13.10 (2013).
- [5]. C. Douligeris, Intelligent Home Systems, IEEE Communications Magazine, Vol. 31, Issue 10, October 1993, pp. 52-61

- [6]. Rana, Jitendra Rajendra and Pawar, Sunil N., Zigbee Based Home Automation (April 10, 2010). Available at SSRN: <http://ssrn.com/abstract=1587245> or <http://dx.doi.org/10.2139/ssrn.1587245>.
- [7]. Amul Jadhav, S. Anand, Nilesh Dhangare, K.S. Wagh "Universal Mobile Application Development (UMAD) On Home Automation" Marathwada Mitra Mandal's Institute of Technology, University of Pune, India Network and Complex Systems ISSN 2224-610X (Paper) ISSN 2225-0603 (Online) Vol 2, No.2, 2012.
- [8]. D. H. Stefanov and Z. Bien, The Smart House for Older Persons and Persons with Physical Disabilities: Structure, Technology Arrangements, and Perspectives, IEEE Transactions On Neural Systems And Rehabilitation Engineering, Vol. 12, No. 2, June 2004, pp. 228-250.
- [9]. E. Yavuz, B. Hasan, I. Serkan and K. Duygu. "Safe and Secure PIC Based Remote Control Application for Intelligent Home". International Journal of Computer Science and Network Security, Vol. 7, No. 5, May 2007.
- [10]. C. Douligeris, Intelligent Home Systems, IEEE Communications Magazine, Vol. 31, Issue 10, October 1993, pp. 52-61
- [11]. Joo, D.Y and Kim, J.K.: Creative & active convergence model of IoT, Korea Institute for Industrial Economics & Trade, Korea (2014).
- [12]. <http://blogs.wsj.com/cio/2015/06/02/internet-of-things-market-to-reach-1-7-trillion-by-2020- idc/>, Jun 2 (2015). 3. Gauer, A.: Smart city Architecture and its applications based on IoT, Procedia computer science, (2015), Vol.52, pp.1089-1094.
- [13]. Bagula, A., Castelli, L and Zennaro, M.: On the design of smart parking networks in the smart cities: An optimal sensor placement model, Sensors, (2015), Vol.15, No.7, pp.15443- 15467.
- [14]. E. Dave, "The internet of things how the next evolution of the internet is changing everything". Technical report, CISCO IBSG, (2011).
- [15]. F. Bonomi, R. Milito, J. Zhu, and S. Addepalli, "Fog computing and its role in the internet of things," Proceedings of the First Edition of the MCC Workshop on Mobile Cloud Computing, ser. MCC'12. ACM (2012), pp. 13–16.
- [16]. M. Armbrust, A. Fox, R. Griffith, A. D. Joseph, R. Katz, A. Konwinski, G. Lee, D. Patterson, A. Rabkin, I. Stoica, and M. Zaharia, "A view of cloud computing," Commun. ACM, vol. 53, no. 4, (2010), pp. 50– 58.