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Home Automation Using Iot: A Survey

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Abstract: *Internet of things is now worldwide usage of any field .Home automation is extension of Internet to provide efficiency and comfort in regular life. Analyzing the current smart phone market, novice mobile users are opting for Android based phones. In the present times, we can find most of the people clinging to their mobile phones and smart devices throughout the day. Hence with the help of his companion – a mobile phone, some daily household tasks can be accomplished by personifying the use of an android application. Home automation gives an ability to control things around the home using the mobile application. A home appliance is a device or instrument designed to perform a specific function, especially an electrical device, such as a light, fan for household use. The worlds appliance and devices are used interchangeably.*

Keywords*: Home automation, Database, Internet, Mobile application, Electrical appliances*

I. Introduction

Home Automation is nothing but automation of the home that is automation of household activity or housework[2]. It can also include centralized lighting control, appliances, ventilation, heating and air conditioning (HVAC), security of doors and gates. It helps to improved comfort, convenience, security and energy efficiency. Home automation is useful for elderly and disabled peoples to increase quality of life so they become less dependent on caregivers. Many of the home automation systems that are commercially available can be separated into two categories: locally controlled systems and remotely controlled systems.

Smart home management has always seemed like a futuristic paradise. Lights that turn on when you enter the room, fans that activate when the temperature is too high, entire rooms changing its ambient at specific hours or when presence is detected. Anyone you tell about these things will think it's a future, unreachable perfect home. But they are all wrong. This kind of devices has been in the market for decades. People have been building their own ideal home over the last years.

1.1 NEED

Many people are always on the move from one place to another due to some reason or work demands. Some of them are away from their people are home leaving their appliances without any kind of monitoring and control all this appliances requires an individual to manually attend to each of the devices independently from time to time. Therefore we propose to design an Internet based home automation system which will enable one to remotely manage the appliances from anywhere, anytime.

1.2 BASIC CONCEPT

Now-a-days Home automation has become important issue. Many types of solutions were developed and implemented. The wireless communication in mobile network has proved to be the best solution among all and has become a fast growing business[4]. With the recent development in the mobile computing devices and the mobile networks new and better solution can be developed to make home automation more convenient and accessible for 24x7 from anywhere and anytime. Our project tries to derive a solution providing a better control on home appliance with the help of cell phone and computer system at home. Also the system comprehends the implications of IT on Administration and functioning of the Home appliances.

II. Literature Survey

- In recent years, home automation popularity has been increasing because of its efficiency and effectiveness through smartphone connectivity and higher affordability. The paper has designed, implemented context awareness from an IoT perspectives and present the necessary background by introducing the IoT paradigm and context aware fundamentals.[1]
- Now anyone can have connectivity with anything for anytime anyplace and possible to create these connections which create advanced dynamic network. In this paper they implemented the solution if any problem occurs in any device connected to the system to achieve this by data mining concept for the best possible solution.[2] Data mining is subfield of computer science which is used to discover pattern in large data sets by using combination of some methods like statistics, machine learning and database system. It

involves analyzing data by applying some conditions converting it into useful information or knowledge.

- The admin can access and control all the appliances connected to each user but a single user can control only the appliances to which the user itself is connected. This whole system using Internet of Things (IoT) will allow mobile devices and computers to remotely control all the functions and features of home appliances from anywhere around the world using the Internet connection.[3]It can also be use for security purposes like gas leakage through smoke sensors where house can be easily monitored and controlled through voice commands like Google Voice, Apple HomeKit and Alexa.[5]
- Applications ranging from smart governance, smart education, smart agriculture, smart health care, smart homes etc can use IoT for effective delivery of services without manual intervention in a more effective manner.[4] This paper discusses about IoT and how it can be used for realizing smart home automation using a micro-controller based Arduino board and Android mobile app. In this paper, two prototypes namely home automation using Bluetooth in an indoor environment and home automation using Ethernet in an outdoor environment are presented.

III. Proposed System

The proposed model of the home automation system is shown in the figure below. In this proposed model, the motion of the electrical appliances in the house is monitored. The data can be analyzed anywhere in the house. This detection of motion is stored in the server. This is done for analysis. If the parameters exceed the threshold level, then any electrical appliances will turn on and off automatically. For example take a cooler if it exceeds the threshold level then it will automatically turn on and off[1]. Another example of lights is that when it is analyzed it will turn on or off by detecting the lights outside the house. The user can monitor other electrical appliances through Internet. This is done through Internet via web server. If any electrical appliances are left on in a hurry it can be seen. This can be turned off remotely through simply typing the IP address of the web server.

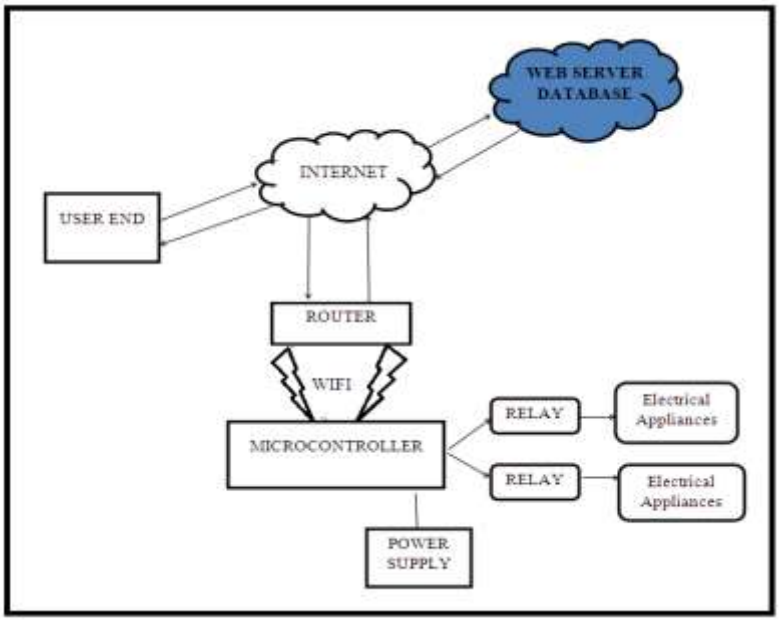

Fig 1: Architecture of Home Automation System

Home Automation system Functions:

The system of home automation that is proposed has capabilities to control and monitor the following components in users home[5].

- Light level: Lights on/off/dim
- Fan on/off
- ON/off different appliance
- We use different sensors to collect the data to understand the environmental conditions and also to detect any fault in devices.
- It is necessary to act devices according to the in habitant requirement. Home PC continuously monitors sensors values and control the devices accordingly.

- If problem found it reports to the web server. Here user can modify some settings and see the devices functionality and working.
- We build one registration application where technicians, supermarket vendors and other service providers will register on it.

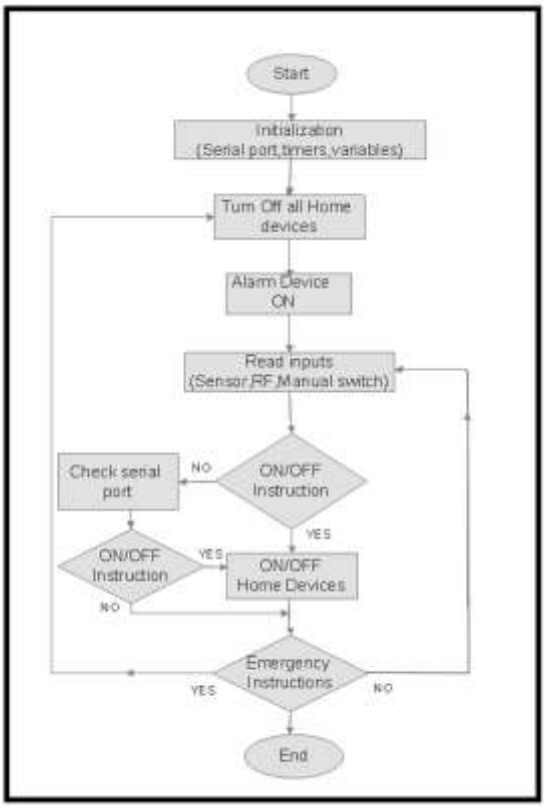

Fig 2: Flowchart of Home Automation System

- It will also mail or SMS Technician and send details to the owner. We can connect to any number of users using web servers and Internet as it supports multi user system characteristics.
- Here we can use only one web server but we can connect many number of users to it via any android devices[2].

IV. Expected Result

Home Automation results in smarter homes and is used to provide a higher and healthier standard of living. The system allows to turn appliances (i.e. light, fan) ON/OFF [2] within their homes from anywhere in the world. The technician database will be saved on the cloud and there will be an android application where the owner can login, view current status, update the status and maintain log. It also detects the fault in the device and if any error occurs while controlling the devices, SMS is sent to the technician automatically and details to the owner. The whole system[3] using IoT will allow mobile devices to control remotely home appliances from anywhere in the world.

V. Conclusion

A smart home system integrates various electrical appliances in a home. It provides monitoring and controlling the home devices automatically according to the user's need. After performing literature survey and studying other existing works, we proposed a technique that gives us better understanding of environmental conditions within the home with less human interaction.[2] In this system we have overcome certain drawbacks like complexity, high competition with vendors, incompatible standards and higher costs. And also providing a user-friendly interface on the host side so that the devices are easily monitored and controlled. Furthermore, the overall system should be swift enough to realize the true power of wireless technology. Our system not only just monitor and control devices but also detects problem in any device automatically. By using these system we can actually manage to make low cost and energy efficient homes. This paper describes the use of various open source hardware such as Arduino, etc. to build smart and secure homes and open source hardware makes the system cost efficient.[5]

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