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AUTOMATION- BEYOND EXTREME

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***Abstract*—(Internet Of Things) IOT is one of the promising technologies which can be used for connecting, controlling, and managing intelligent objects (things) which are connected to internet through an IP address. Number of devices that can be interconnected through IOT is shooting up day by day. IOT conceptualizes the idea of connecting and monitoring real world objects through the internet. This paper depicts the pros and cons of unawareness and negligent usage of conventional home automation system and suggests innovative devices that can make rapid change in the relm of home automation. It envisages the wide spread usage by breaking the hindrances of cost, scientific awareness physical efforts etc.**

Keywords- IOT, IP

I. INTRODUCTION

Technological advancement by its virtue gives its birth to home automation in the early 20th century itself. It made its mark in every walks of human life as its miracle versatile innovation contributes a fingertip solution to many hazardous problem faced by them. The quest and search for more effective automation brings IOT based automation. IOT based automation not only brings advancement but also brings cost reduction.

Home automation or smart homes is described as a technology which is used within the home environment to provide comfort, security, convenience, and energy efficiency to its user or occupants. By inclusion of the Internet of Things (IOTs), the research and development of home automation are going to become more and more popular. Different wireless technologies that support remote data transfer control and sensing such as RFID, Wi-Fi, Bluetooth, and also cellular networks have been evolved to add intelligence at various levels in the home. Internet of Things (IOT) is nothing but physical items talking to each other, machine-to-machine communications and person-to-computer communications will be extended to "things". Extension of the current Internet which providing communication, connection and inter-networking in between the devices and physical objects, or also known as Things, is a growing trend that is often called as the Internet of Things. The Internet of Things (IOT), also referred as the Internet of Objects, that's going to change everything which also include ourselves. IOT is the next evolution or generation of the Internet, it's like taking a huge leap in its ability to collect, analyze, and distribute data which ultimately we can turn into information then knowledge and finally into wisdom

Among many IOT applications, smart homes play an important role in realizing smart cities. It can be attained in two ways (Refer III. Implementation Details) Smart homes can be used for remotely monitoring and controlling electrical appliances fitted inside the home using smart & intelligent physical infrastructure. The present Government of India (GOI) has proposed to develop 100 smart cities across the country which will create a huge demand for smart home automation solutions in near future. In "smart home" the word "smart" means context aware which can be realized using Information and Communication Technology (ICT) and IOT.

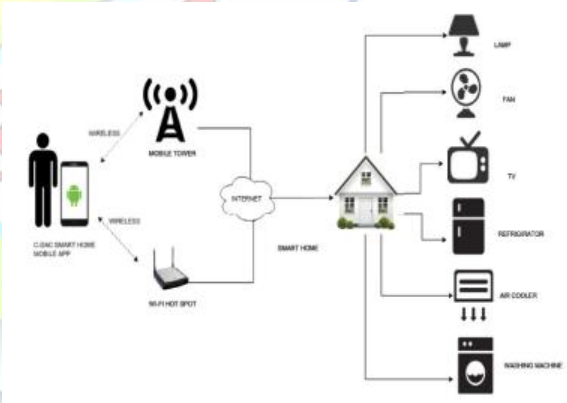

Fig: Base diagram of home automation.

II. MOTIVATION

To improve standard of living it is needed to change home environmental condition according to the mood of the habitants without any interruption. In some cases physically disable or handicapped people are not able move much from one place so for them it is very difficult to access regular domestic appliances. For them it is essential to develop a system which requires less human interaction. We need energy efficient, flexible system which also detect the fault in the devices automatically and notify the related technician and user about the problem automatically. To provide all

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this facilities in developing countries like India we need a much smart system which provides all the above facilities in low price and less energy consumption.

Fig : smart home infrastructure

III. IMPLEMENTATION DETAILS

A. Home Automation System using Bluetooth

In this paper, the concept of home automation using loT is realized using 10w cost micro-controller based Arduino board and an Android mobile phone. Arduino is a open source platform that can be used for prototyping any hardware and software. Arduino can be programmed to receive keyboard input or sensor data and control various electrical appliances connected to output peripherals. Since mobile phone is a Wireless communication device, connectivity between Arduino and smart phone is established using Bluetooth, one of the short range wireless communication technologies that can be used for communication in an indoor environment. Operating at universally available frequency of 2.4 GHz, it can connect digital devices within a range of 10-20 meters (theoretically expandable up to 100m, by increasing transmitter power) at the speed of 256 Kbps to 1 Mbps. Since Arduino micro-controller unit does not have inbuilt Bluetooth radio, an external HC-05 Bluetooth module is used for establishing wireless connectivity as shown in Fig . Once Home appliances are connected to Arduino board, they can be easily controlled using any Bluetooth enabled smart phone inside a smart Home.

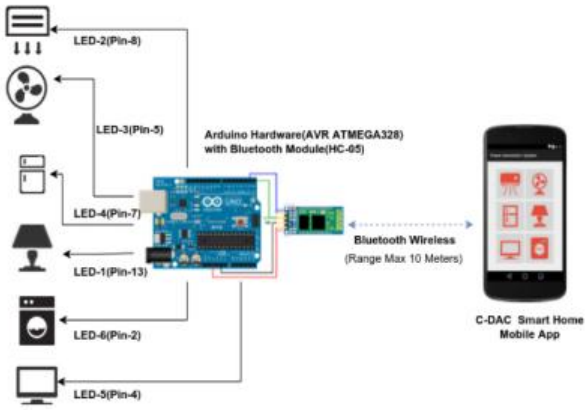

Fig : Implementation of Bluetooth Automation

Android based mobile application is developed using Android studio that provides complete development environment for developing any mobile application including tools for compilation, verification, debugging and packaging. Android application consists of following two activities. A splash screen showing application home page And Second screen consist of 6 icons corresponding to various electrical appliances namely Lamp, AC, Fan, Refrigerator, TV, Washing Machine. Statuses of these appliances are indicated using a Light Emitting Diode (LED). RED color indicates that an appliance is in OFF state and GREEN color indicates that an appliance is in ON state. [3] discussed about a system, GSM based AMR has low infrastructure cost and it reduces man power. The system is fully automatic, hence the probability of error is reduced. The data is highly secured and it not only solve the problem of traditional meter reading system but also provides additional features such as power disconnection, reconnection and the concept of power management. The database stores the current month and also all the previous month data for the future use. Hence the system saves a lot amount of time and energy. Due to the power fluctuations, there might be a damage in the home appliances. Hence to avoid such damages and to protect the appliances, the voltage controlling method can be implemented.

Fig: Andriod app

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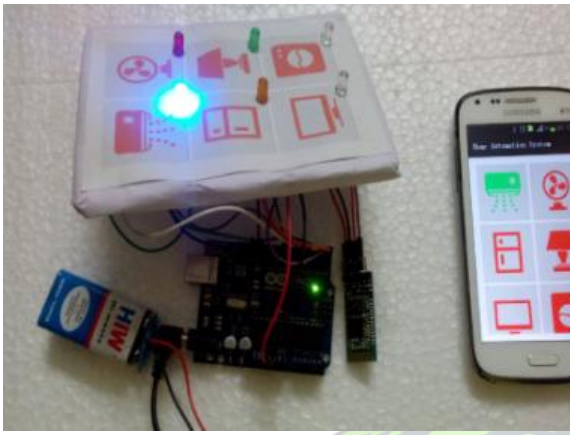

Fig :Prototype

Though a prototype smart home automation system using Bluetooth is realized, there are some practical challenges associated with it. This Bluetooth based solution cannot be used from a distant location, as it uses short range wireless communication technology which can work up to lO-20 meters only. This application can only be used by a person to control and manage appliances in an indoor environment.

B. Home Automation System using Ethernet

The main drawback of Bluetooth based home automation can be overcome using Ethernet technology. In this section, Ethernet module is used for connecting Arduino board from any part of the world. Arduino Ethernet module IP address and Port number can be used to locate remote device connected to the Internet in a smart home environment. Android mobile app can be used to control electrical appliances from a remote location. Ethernet shield is placed just above Arduino board which is connected to RJ-45 for Internet connectivity. In this architecture, Arduino board is configured as a server. Whenever user enters IP address and Port number, request will be sent to Arduino board (server), which in turn serves a HTML web page which is stored in Arduino micro SD card. LED corresponding electrical appliance can be switched ON/OFF using Android mobile app as shown in Fig

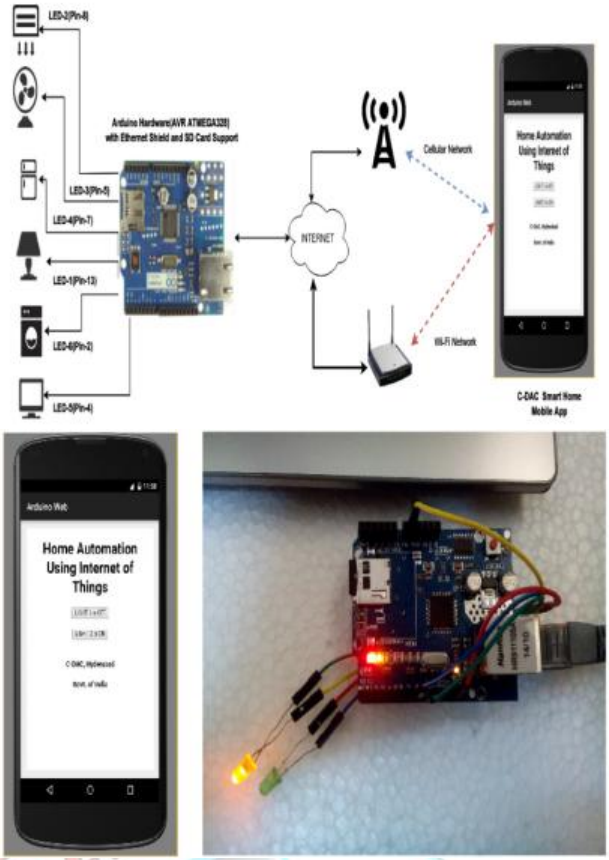

Fig :Implementation of IOT based automation

IV. EFFECTIVE FEATURES OF IOT BASED HOME AUTOMATION

- Energy saving: Home automation system turns on and off lights, music system and other electronic devices automatically and saves energy.
- Remote access: Users can control many functions in their house like electric system, security system, alarm system etc. through a smartphone. Thus, people can monitor the environment of their house through the smartphone from anywhere else.
- Climate controller: This system turns on and off air conditioning system according to the necessity. Thus, this system also saves energy.
- Upgradeability: Developer can provide updated version of software automatically.
- Improve safety and security: Through the automated door locks you can lock your door from different places and can ensure 100% security.
- Free support: Developer will provide costless support and guidance at any instance.

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V. CONCLUSION & FUTURE SCOPE

A prototype smart home automation using Bluetooth and IOT is the subject to matter of this paper. This research work will be carried forward by integrating relays to Arduino board for controlling home appliances from a remote location in a real scenario. This venture is a simple explanation of relevance of IOT and its revolutionary changes in the realm of home automation and in its users.

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