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Home Automation Using IoT (Internet of Things) with Fan Speed Control

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Abstract: IOT or "Internet of Things" is an advanced technology which allows user to control hardware devices through the internet which is very fast and covers a wide coverage area. In this work IOT is used to control home appliances, thus automating modern homes through the internet. This system uses three loads to demonstrate, which are house lights and a speed control of a fan. User friendly interface allows a user to easily control these home appliances through the internet, HTML code is used for creating an UI for the user, and Embedded C is the commanding code for the Microcontroller. Thus the system allows for efficient home automation using internet. The system can be useful to those who need to access their appliances at home while they are away and also can incredibly help to improve the lives of the literate physically disabled and old aged people, earlier Home automation systems which were using technologies like Bluetooth, Zig bee and Z wave, and remotely controlled by using SMS. They have limitation, because they depend upon SMS delivery, which they had a time delay.

Keywords: IOT, AVR Microcontroller ATMega 328, HTML, Embedded C, Relays.

I. INTRODUCTION

From past ample of years home automation was a fantasy for the technical research scholars to implement it in day to day life for the betterment and comfort of mankind. Scientist made it practical in early 20th century, with the aid of upcoming revolutions in the field of Electrical and information science. Home automation or smart home is rather presented as a emerging technology made feasible within the home environment to facilitated enough comfort, convenience, flexibility, security and energy efficient system for the user.

It gained more popularity when "Internet Of Things" ie IOT joined hand in hand with the home automation system. Also various wireless technologies enhanced the beauty& efficiency of the system by making use of technologies like remote data transfer, Bluetooth, RFID sensing and controlling, Android mobile phones, Wireless Fidility (Wi-Fi), Cellular networks and also using internet through PC.

However the term "Internet of Things (IOT)" has come to describe today a number of technologies and research disciplines that enable the Internet to reach out into the real world of physical objects to control their operations. It literally means connecting everyday objects like Internet, TVs, sensors, actuators and the smart phones to the Internet where the equipments and appliances at home are intelligently linked together enabling a new form of communication between objects and people and also between objects themselves.

II. LITERATURE SURVEY

Home automation was a dream in past many years, a vision of excellence in future technology for many brilliant scientists those who are working on practical miracles using the upcoming technologies to make human life more comfortable and beautiful. That took wings in the early 20th century, which introduced the intelligent use of electricity and information technology. The very first remote control devices began to occupy and emerge in late 1800s, to list out few Nikola Tesla, patented an idea for the remote control of vessels and vehicles in year 1899. [1]

Home automation is gaining its popularity in past few years due to its affordable cost, simplicity, and easy connectivity with the smart phones and tablets. A new concept "Internet of Things "has made the home automation system more popularized. This assembles the electrical home appliances and devices with each other. The new concept of integration of home environment with information technologies into a well communicate in an one body manner to conserve the electrical power, ease of use and energy efficient system also at safety perspective benefits.[2]

In recent years the home automation system is gaining its importance because of its simplicity and easy connectivity with upcoming smart phones and gaining importance with its affordability. As known in home automation system various home appliances are connected to each other using information technology to enhance the energy efficiency

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and security system. The problem with such a system is its complexity with user and other devices and adaptability. This results the home automation system more costly and makes accessible to only wealthy crowd.[6]

A. MOTIVATION

Home automation in simple words automation of home appliances using internet of Things & controlling of the various home appliances from anywhere, at any time with the fastest speed and having wide coverage area. It may include centralized lighting system, heating and air conditioning system (HVAC), ventilation and also security system as doors and gates [2]. Hence gives plenty of advantages for literate physically disabled and old aged people to become independent in using the appliance utilities, without taking help from others.

B. OBJECTIVE

Objective of this system is to concentrates mainly on effective use of "Internet Of Things" as to conserve electric energy, provide comfertability, a system faster than the existing technologies , covers wide range of distance ,and an user friendly interface, User can control his home appliances anytime from anywhere easily & comfertablely using wireless communication concept[3]. Hence home automation can be extremely useful to those who need to access their appliances at home while they are away and also can incredibly help to improve the lives of the physically disabled and old aged people. This proposed system which will run on Internet of Things on PCs, which will control the home appliances. Using this system one can control appliances of their home by simply using the web application from anywhere in the world. The application works real time, hence there is negligible delay. As a practical use housing appliances like lights are controlled along with speed of fan. [5]

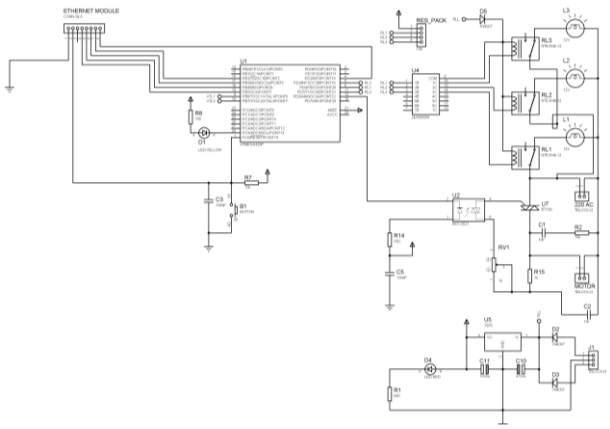
C. LIST OF COMPONENTS USED

Sl No	Component	Rating/IC Number
1	Microcontroller	ATMega 328
2	Ethernet shield	W5100
3	Zero crossing Detector	MOC 3021
4	Traic	Bt 136
5	Relay driver	ULN2003
6	Voltage Regulator	7805
7	Relay	12V
8	Electrolyte Capacitors	2200uf, 1000uf, 100uf.
9	Resistors	10K, 60ohm,
10	Transformer	120-12V
11	Accessories	------

D. PROBLEM DEFINITION

Many existing & well-established home automation systems have been based on wired technologies traditionally, which does not use Internet of Things, which are too slow in speed, and covers very short range of distance. This was not a problem until the system is planned well in advance and installed during the actual construction of the house. However in already existing buildings the implementation cost for the same is very high. In contrast wireless systems are of great help for such things.

III. DESIGN AND IMPLEMETATION



A. Working

Here is a circuit containing Atmega328 micro-controller with its all basic components as shown. For power supply to provide 5V, the circuit consists of step down transformer of 230/12V. This transformer steps down 230V AC from main supply to 12V AC. Then that 12V AC is converted into 12V DC with the help of bridge rectifier. After that a 1000/25V capacitor is used to filter the ripples and then it passes through voltage regulator 7805 which regulates it to 5V.

There is ULN 2003 IC driver is connected to the port D of micro–controller. So all the loads which are individually connected to this ULN 2003 IC driver through a separate relay. There is Fan connected at pin 12 of micro controller through MOC 3021 and Triac BT136 for controlling the speed of Fan.

There is Ethernet shield module with its all basic is connected to the port B of Atmega 328 micro – controller.

The Arduino Atmega328 creates a HTML page on WLAN network through which it is connected for controlling the loads and Fan speed.

Working model Of the Project

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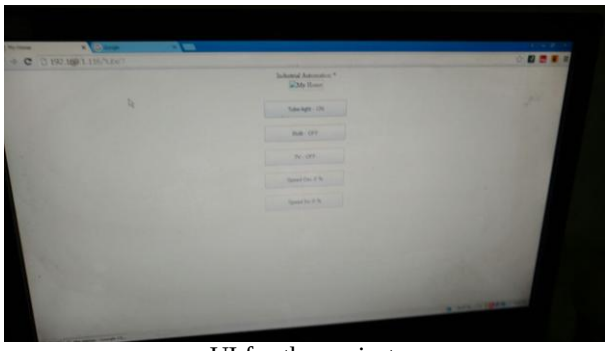
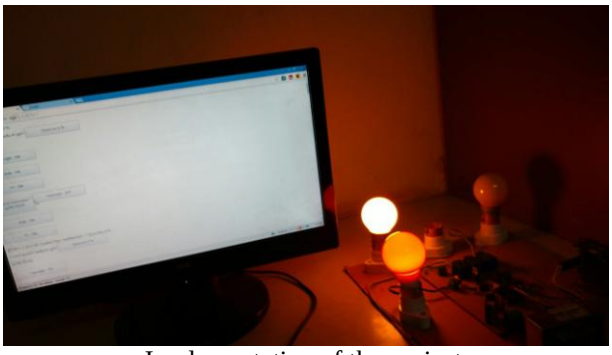


UI for the project



Implementation of the project

IV. CONCLUSION

The aim of this project is to remotely control home devices through Internet of Things. So here developed an application, which is the fast and wide ranged communication media between the two different platforms compared to the previous available technologies like Bluetooth, Zigbee, Zwave etc. Demonstration of switching ON/OFF of three lights and a Fan with its speed regulation is shown.

Technologies	**Standard**	**Frequency**	**Range**	**Data Rates**
Blue tooth	4.2 core	2.4 GHz	50 meters	1Mbps
Zigbee	3 based on IEEE, 802.15.4	2.4 GHz	10 meters	250Kbps
Z-wave	Z-wave zad 2837/ ITU	900 MHz	30 meters	100Kbps
Wi-Fi/ IOT Proposed	**802.11n**	**2.4 GHz - 5GHz**	**More than 50 meters**	**500Mbps -1Gbps**

V. FUTURE SCOPE

By using this project in future a security system can also be built for homes. This project will make homes more secure in future. With the help of this project live pictures of automated homes will be seen in PCs in real time from a remote location. Home temperature control is possible from a remote location by using Internet of things. A solution to transform a normal house to a smart house while reducing the energy consumption is proposed. This application can also be extended to industrial automation applications.

REFERENCES

[1] Vishwajeet Hari Bhide, Dr Sanjeev Wagh "i-Learning IOT: An Intelligent Self Learning System for Home automation Using IOT" International conference on communication and signal processing. April 2-4, 2015

[2] Mamta Khatu, Neetu Kaimal, pratik Jadhav, Syedali Adnan Rizvi " Implementation of Internet of Things for Home Automation" IEEE volume 3, issue 2 February 2015.

[3] Vinay Sagar K N, Kusuma S M " Home automation Using Internet of Things" IRJET volume 2, Issue 3 June 2015

[4] Vishwajeet H Bhide "A Survey on Smart Homes Using Internet of Things" ijarcsms , Volume 2, Issue 12, December 2014.

[5] S.D.T Kelly, N.K Suryadeva, S c Mukhopadhyay, "Towards the Implementation of IOT for Environmental Condition Monitoring in Homes "IEEE, Vol 13, pp 3846- 3853, 2013.

[6] Oladayo Bello, Sherali Zeadally, "Intelligent Device-to-Device communication in the Internet of Things", IEEE, Vol pp, issue 99