

Implementation of Fan ON/OFF Control Using Internet of Things for Home Automation

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ABSTRACT: IoT is one of the platforms of today's Smart City, and Smart Energy Management Systems. Internet of Things (IOT) is a recently emerging advanced technology by which devices can be monitored and controlled through internet. IoT is gradually gaining its importance in building automated industrial system using wireless devices, sensors and controllers. Home automation or smart home is rather presented as an emerging technology made feasible within the home environment to facilitate enough comfort, convenience, flexibility, security and energy efficient system for the user. IoT can also be used in controlling home appliances resulting in automated homes. The system proposed here is to control the speed of Fan.HTML code is used for creating an UI for the user, and Embedded C is the commanding code for the Microcontroller .Thus the system leads to an efficient home automation using internet. The system can be useful to those who need to access their home appliances while they are away and also can incredibly help to improve the lives of the literate physically disabled and old aged people. By the system proposed we are demonstrating a cost effective, user friendly system. The main target for this system is to design and implement a cost efficient system.

KEYWORDS: Home automation, Fan speed control, Internet of Things, Wireless communication

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 an emerging technology made feasible within the home environment to facilitate enough comfort, convenience, flexibility, security and energy efficient system for the user. The Internet of things is the internet working of physical devices, vehicles (also referred to as "connected devices" and "smart devices") buildings and other items embedded with electronics, software, sensors, actuators, and network connectivity that enable these objects to collect and exchange data. 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

When these household devices in smart homes connect with the internet using proper network architecture and standard protocols, the whole system can be called as Smart Home in IoT environment or IoT based Smart Homes. Smart

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Homes ease out the home automation task. This paper presents not only the problems and challenges come in IoT and Smart homes system using IoT but also some solutions that would help to overcome on some problems and challenges. [1] Reference [2] presents an automated irrigation system based on a distributed wireless network of soil moisture and temperature sensors that achieves water savings of 90% compared with traditional implementations Reference [3] we have reported an effective implementation for Internet of Things used for monitoring regular domestic conditions by means of low cost ubiquitous sensing system. The description about the integrated network architecture and the interconnecting mechanisms for the reliable measurement of parameters by smart sensors and transmission of data via internet is being presented. 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 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. [4]

III. BLOCK DIAGRAM

A simplified operational block diagram of the proposed system is shown in Figure 1.

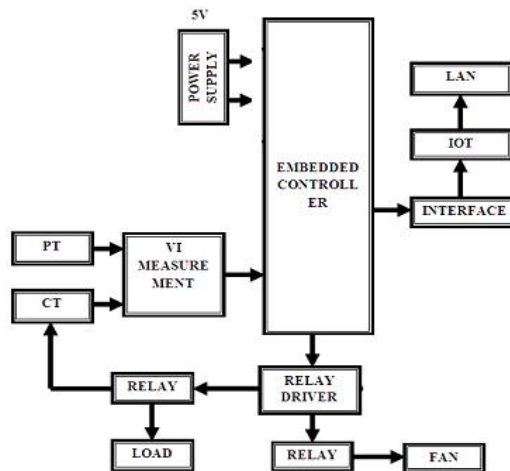


Fig.1: Block diagram of the proposed system

The measured signals are pre-conditioned as described in section 3 before they are transmitted to a remote access point and a control station (personal computer). The system features two-way communication capability which enables synchronized data transfer and acquisition.

IV. PROPOSED SYSTEM

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. Many existing & well-established home automation systems have been based on wired technologies traditionally, which does not use Internet of Things, which is 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

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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.

V. IOT COMPUTER CONTROL

During IOT process, the computer shows the details i.e. the measurement units about the load using the internet server. The user can control the load from a distant either to load ON or OFF.

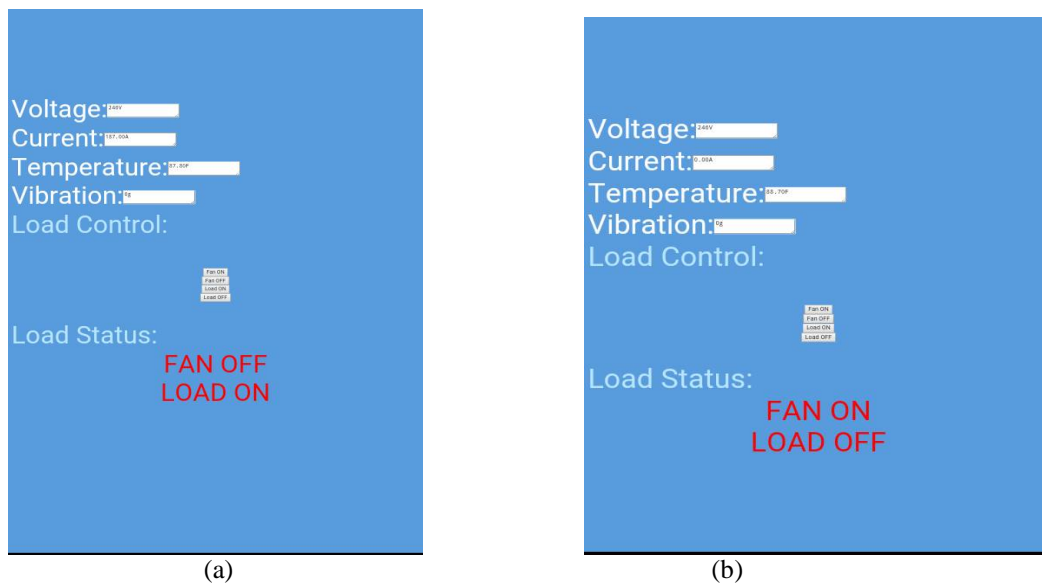


Fig.2: (a) IOT Computer Control (Fan Off) (b) IOT Computer Control (Fan On)

VI. HARDWARE SYSTEM

The hardware system of the proposed model is shown in the Fig 4. 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. All the loads 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.

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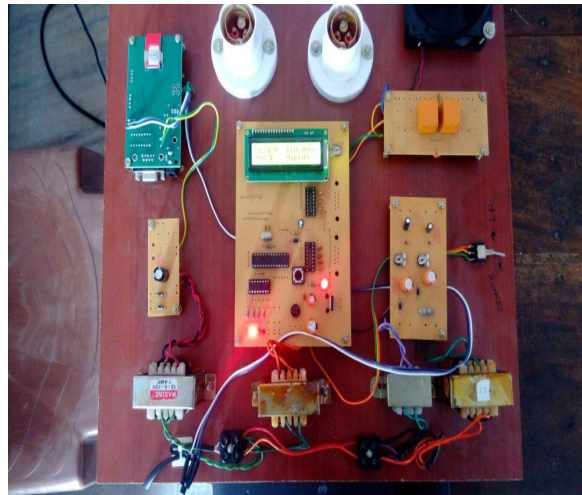


Fig 3. Hardware Set up

The IOT Hardware consists of the controller, modem, sensors for the control of temperature, LCD Display, switch, loads. According to the load the monitor displays the measuring details in the LCD Display.

LM35 is the Temperature Sensor posses low self heating and does not cause more than 0.1 °C temperature rise in still air. The operating temperature range is from 100 °C to 150 °C. The Colpitts Oscillator is used for running the relay driver circuit. It is a capacitive voltage divider network as its feedback source. The Rectifier used for the controller is bridge-rectifier. It acts as a switching control for the load.



Fig 4 IP Address Display

A particular IP Address is generated in the LCD at an instance by the modem provided. With the help of the internet server, on providing the IP address, the connected load measurements are monitored and controlled. The IOT Control thus acts as an interface between the controller and the server. For minimizing the power consumption, a unidirectional data transmission scheme was used, and the sensors waking up periodically, powering up the attached sensors, taking the measurements, and sending the data using the Wi-Fi module and the UDP protocol. The choice of the protocol was motivated by the lower packet size, increased speed, and low latency compared with that of TCP/IP and by the fact that it offers connectionless communication.

VII. FUTURE SCOPE

The system also can raise an alarm and send a text message to warn the administrator the system can be extended to industrial automation and protection this system is able to collect the information about the main environmental

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parameters such as Temperature, Humidity. The collected data and the generated control signals are stored on database to be analyzed for enhancement of the crop growing purposes. We are developing a system for Industrial Automation using IoT with the help of Artificial Intelligence to make system automated which will take intelligent decisions.

VIII. CONCLUSION

The aim of this paper 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 This project has demonstrated the feasibility of fan control through internet.

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