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Innovative Model To Conserve Energy At Home Using IoT

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Abstract: In this, paper a low cost and user -friendly home automation system is used. In this, we have tried the proposed system about home Automation with the help of electronic devices. We can operate household equipment on it. As sources of energy are limited, so we need the system which conserves the energy. As the proposed system is low cost so it is used by society easily. Home Automation aims to control the devices in a smart home through wireless communication and IOT technology. It brings ease in operating devices which are used in day to day life. The IOT based home automation system offers a lot of flexibility over the wireless communication system. IOT is the technology that connects the electronic devices with software and exchanges the data between them. The most important feature of IOT is to integrate the various model to improve user experience as well. IOT technology brings passive networks to active networks. IOT technology represents the trademark of future networking. So we propose a system that requires less consumption energy. By using IOT technology we can reduce the efforts of society.
Keyword: Smart home, Arduino, PIR sensor, LM35 sensor.

1. INTRODUCTION

Home Automation is whatever you want it to be. It is anything that allows us to use our home appliances easily and conveniently. It is as simple to control lights or all home appliances present in around. It came into existence since 1985. [IV]A good home is not that which has many blocks, good infrastructure etc but it is the one which has technologies available. Before a few years back every appliance was attached through wires. But in this era, we see new innovations people are bringing for their comfortable life.

A Few years back people use to depend more on the manual, labor work but nowadays due to the technology available people can do the work easily. Many companies came into existence due to new ideas, innovations and the demand available in the market. "There is like a rat race going in a market" every new individual or companies develop some or other new innovations.

There are many household works to do but nowadays facilities are so available that for eg- for cleaning floor vacuums are available, for washing clothes washing machines are available, for washing plates plate washers are available. Due to this human needs fewer efforts.

This system is for all the type of people aged, children, teenager etc. This system is for energy/power consumption i.e no wastage of electricity or power because of the irresponsibility of switching off the power. So do this, we save energy and one can easily move in and move out without any problem for switching on and switching off the power through the use of sensors. Sensors are used for turning on lights by detecting our presence, adjusting room temperature, detect smoke or fire, makes coffee, open garage doors as soon as our car is near to the door, etc i.e it makes our life easier. Human efforts become less due to the appliances and technologies available in IOT technology. After IOT technology came into existence human efforts are reduced. The Internet OF Things (IoT technology) is a web network that connects the people with electronic and software devices. These products are able to exchange data between devices .i.e. smartphone, laptop, tablets, desktop etc. Home automation is based on IoT technology, which is used in heating, security system, lighting, mobile technologies etc. By this technology, a human can reduce their efforts in the day to day life and they live their life with enjoyment, comfort. Wireless technology is present in home automation by using IOT. This technology is very efficient for old and disabled people. Home automation provides ease in work for a human being. Due to changes in temperature which corresponds to change in the physical property like resistance/voltage we use the temperature sensor. They are everywhere like computers, mobile phones, automobiles, air conditioner, industries etc.

2. PROBLEMS WITH EXISTING SYSTEM

As there are many devices available in the market for home automation but there are some drawbacks in

that. In the paper of Pavithra.D.Ranjith Balakrishnan "IOT based Monitoring and Control System for Home automation" there is a major drawback of human monitoring continually required in this system[1]. In this paper of Muhammad Asadullah "Smart House Automation System Using Bluetooth Technology" in this smartphone application is must which is used to control the device in our system, this is disadvantages of this system[III]. In the paper of Fu Jiuqiang, Jiang Bing, Yang Xin "Design and Management Methods of Smart House Human-Computer Relationship". In this paper human and computer interaction is necessary and desktop also[VI]. In this paper Ishan Krishna K Lavanya "Intelligent Home Automation System using Bit Voicer" this is set up to only limited frequency[IV]. So we proposed the system that overcomes all drawbacks.

3. PROPOSED SYSTEM

To overcome these drawback we proposed the system which is very useful in day to day life of people. In our system, we overcome the drawback of human-computer technology. In our device, the human operating system is not needed this works automatically. This is a major advantage of home automation. We also overcome bit voicer technology in home automation. This device will reduce some sort of efforts in the life of people. We overcome the drawback of the internet which is used by a device. This device requires less consumption of energy.

4. SENSORS

A sensor is an electronic machine which detects the physical movements and which respond to the environment. Our system used two types of sensor which can detect temperature and motion they are as follows:

A) PIR

The Proposed system provides safety, comfort, ease etc.

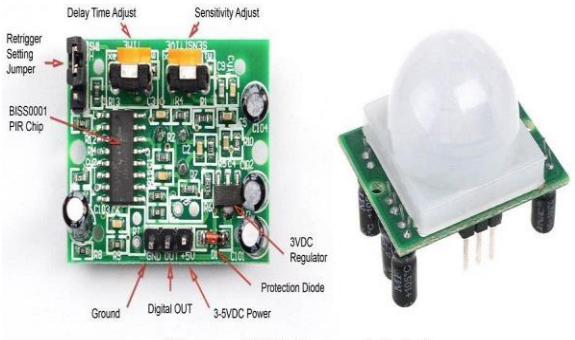

Figure : PIR Sensor Module

Fig 1: PIR Module

As we know Human or animal body radiates energy in the form of infrared radiation. Hence when human/animal come in the range of PIR motion sensor, a motion is detected by the sensor as it receives thermal energy. Energy is generated by PIR sensors when exposed to heat. PIR sensors not only detect motion in indoors as well as in day or dark. When your system is armed, your motion sensors are activated. Once the sensor warms up, it can detect heat and movement in the surrounding areas, creating a protective "grid." If a moving object blocks too many grid zones and the infrared energy levels change rapidly, the sensors are tripped.PIR sensors do not only consume less energy(0.8W to 1.0W) but also they are cheaper as compare to other sensors.PIR sensor detects a human being moving around within approx 10m from the sensor. This is an average value, as the actual detection range is between 5m and 12m it is beneficial for home automation purposes.

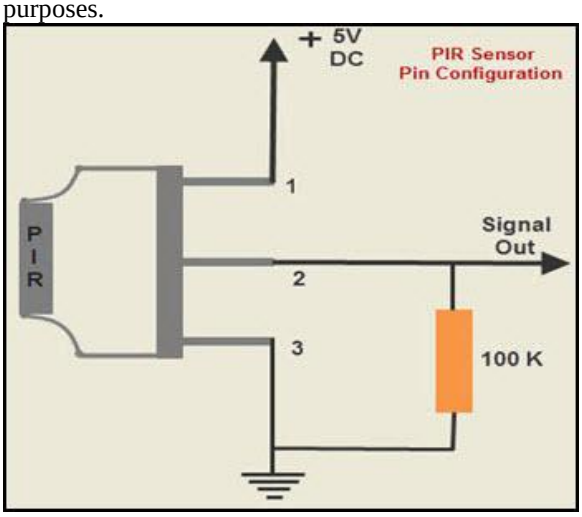

Fig 2: Circuit Diagram Of LM35

B) LM35

Fig 3: Pin Diagram Of LM35

Initially, LM35 is a precision integrated circuit temperature. It is not only low cost due to water trimming but also it has the property of low self-heating. The output voltage produced by LM35 is proportional to the centigrade temperature scale. LM35 sensor circuit has terminals such as two inputs like non-inverting (+) and inverting (-) and only one output pin.1 as the output of the transistor is very low so it is necessary to amplify the output signal. Amplification is done by an amplifier which converts a low-level signal into a high- level signal. As microcontroller operates a 0 and logic 1 (binary no.) output of the converter is given as input to analog to digital converter. Amplifiers are
used because of the variation between input terminal Operational amplifier IC 741 is used as a non-inverting amplifier. An Output of Sensor is connected to an analog to digital converter through Amplifier.

The function of LM35 IS converted to physical quantity electrical signal into a transistor to digital form. Here we use ADC0808/09 which converts an analog signal into 8 -bit digital output and then ADC is given to microcontroller. A Controller receives the information and as compare with reference program if input temperature is less than reference temperature then controller then switch on the heater if input temperature is greater than reference temperature then controller switch on the fan or other household equipment and maintain the constant room temperature.

.The amount produced by IC2 amplifies in an amount to the temperature by 10 mV per degree. This unstable voltage is supply to a comparator IC 741 and it responds instantly. 1 If the temperature of the sensor is 0◦ centigrade the output of sensor will be 0V, if the temperature is 10◦ centigrade the output, that means for every 1 centigrade there will be the +10mV rise in temperature. As it can be produced by national semiconductor it can operate over a range -55◦ centigrade to 150◦ centigrade. LM35 has an advantage over other temperature sensors calibrated in Kelvin as the user don't require subtraction of large constant voltage to obtain require centigrade temperature.

5. ARCHITECTURE OF SYSTEM

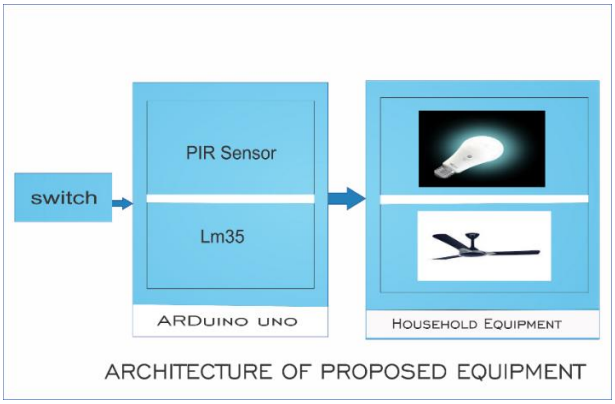

Fig 4: Architecture

The system consists of 3 parts: The switch, the PIR sensor Or LM35 and the Household equipment which will always be in ON state as the sensors are controlling the devices. Hardware implementation of a smart house system should have the features of easy development, low power consumption, and low cost so PIR sensor and LM35 sensors are used which have very low cost. The PIR sensor i. e. passive infrared sensor is an electronic sensor that measures infrared light radiating from objects in its field of view. The PIR sensor will sense the presence of the object that is nothing but the person and will perform the action accordingly. When the person is present in that particular room Or office Or hall the sensor will detect the presence of the person and will automatically turn ON the devices for which the sensor works. The sensor will work according to the external temperature as well as our body temperature. For example: According to the external temperature the fan speed will get increase or decrease that is when the temperature is -55◦ centigrade to 150◦ centigrade. increased the speed of the fan will also be increased The system consists of 3 parts: The switch, the PIR sensor Or LM35 and the Household equipment which will always be in ON state as the sensors are controlling the devices. Hardware

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Similarly when there is no object that is a person present in that particular area the devices will automatically turned off after a certain time interval specified for that sensors. We have also used LM35 sensors which will measure the temperature more accurately than with a thermistor. It also possesses low self- heating and does not cause more than 0.1 centigrade temperature rise in still air .the operating system range from -55◦ centigrade to 150◦ centigrade. These sensors are mounted on the Arduino uno board which is open source hardware and microcontroller board which is based ATMEGA 328p processor. It has 14 digital input or output and 6 analog input pins and operates at 5 volts and 16Mhz quartz crystal frequency.

6. CONCLUSION

In this paper, we proposed a system which provides automatic working of household equipment. In this System, we will use electronic device and Internet Of Things Technology. This helps in energy saving. It falls down human efforts. The system can be implemented in many places like office, laboratory, banks, home etc. The coming future application of this device in many fields like fire accident, in household devices, in the industrial area etc.

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