**Motivation**

* Many existing solutions in Home Automation system lacks some significant features, such as; they are not affordable due to high cost, difficult maintenance and the solutions they provide are not very useful for household applications.
* Many tasks are still repetitive in nature. For example, users switch on/off and dim lights, fans etc manually.
* Many accidents at home occur due to poor lighting condition.
* Sometimes at home, the lights or fans remain switched on unnecessarily when the residents go outside their home.
* So home automation products can reduce these power consumption, utility bills and automatically turn off lights and appliances when they are not in use.
* Using IoT based home automation products, users can check the status of their home appliances while they are away.
* Since, many home automation devices are expensive in market, so lot of people in our country can’t afford these products, also most people here lack knowledge for using these technologies.
* The motivation for doing this project is to let people know about these technologies and make the system as simple as possible for an ordinary person to understand and to facilitate the users to automate their home having remote access to the appliances and make their life convenient and comfortable.

**Existing works:**

* Ravi Kishore Kodali et.al [ ] proposed an IoT Based Smart Security and Home Automation System. He replaced the Bluetooth controlled home automation system with the smart security system. The main objective of this project focused on building a smart wireless home security system which sends alerts to the owner by using internet in case of any trespass and raises an alarm optionally.
* Kumar Mandula et.al [ ] proposed a solution for smart home automation using microcontrollers (Arduino) along with an Android mobile app. The device will be controlled through Bluetooth in an indoor environment and Ethernet for outdoor environment.
* R. Baris Dai et al [ ] proposed dimmer circuit for controlling three different light sources incandescent bulb, CFL and LED. These different lights were tested with AC and DC sources. Experiments were performed in order to observe the electrical characteristic of the dimmer and optical characteristic of the lighting devices when they are used with the dimmer circuit. The experimental results showed that the proposed dimmer can be used with these lighting devices within specific output voltage ranges.
* Jong-Hyun Kim et al [ ] proposed a simple dimmer using a MOSFET for AC driven lamp such as AC LED and incandescent lamp. He proposed a new method for controlling the dimmer which is Pulse Width Modulation (PWM) method and compared the conventional phase-controlled dimmer system with his PWM method.

**Here, many people in our country are still not technologically literate, they are not very familiar with computers and cannot directly interact with computers. This is why they are not aware of the flexibility and convenience that a home automation system can bring into their lives.**

**Abstract / rough idea about the topic :**

Our project represents an IoT based Home Automation system using semiconductor which can control the switching of the power outlets in terms of controlling various electrical appliances, such as lights and fans or any inductive load that can be voltage regulated and switching various devices on and off. This system contains a Zero Crossing Detector (ZCD), a Thyristor based switching circuit to control the power output to the loads and also a Web Server along with a database and API functionality since the whole unit needs to be controlled through the web.

|  |  |  |
| --- | --- | --- |
| Materials | Quantity | Price(taka) |
| *Arduino*(UNO & Mega) | 3 | 1950 |
| Fingerprint module | 1 | 3217 |
| LCD display | 1 | 206 |
| Door lock | 1 | 720 |
| Webcam | 1 | 1300 |
| Battery | 1 | 311 |
| Memory card | 1 | 900 |
| PIR sensors | 1 | 189 |
| Piezo Buzzer | 1 | 180 |
| *Arduino* compatible SD card shield | 1 | 1200 |
| Breadboard | 2 | 190 |
| LEDs,Resistors,Transistors | - | 100 |
| Papers,Colors,Cardboards | - | 1000 |
|  |  | Total: 13000 |

Table 6.1. Total Costing Breakdown

**Motivation & Objective:**

* Many existing solutions are not affordable due to high cost.
* Many tasks are still repetitive in nature, such as; switching on/off fans, lights etc manually.
* Many people cannot use technologies because of it’s complex functionality.
* Sometimes, the lights or fans remain switched on unnecessarily when the residents go outside their home.

**Our Objectives:**

* To enable people to control their home appliances in real time from anywhere in the world.
* To minimize operating costs.
* To simplify use of technologies.
* To promote energy efficiency and convenience.
* The physically challenged people can also easily control the basic appliances through our web interface.
* Our system can also be used in hospitals, office buildings etc to manage certain room conditions.