**Chapter 06: Conclusion**

**6.1 Overview**

In this chapter, we are going to explain about - the total cost of all the tools used in our project, some of the limitations or challenges related to our project and how we can make our system more efficient by doing further developments in the future.

**6.2 Cost Analysis**

The following table shows the cost of each tool used in our project along with its quantity and also shows the total cost for the whole unit.

|  |  |  |
| --- | --- | --- |
| **Materials** | **Quantity** | **Price(Taka)** |
| **Arduino Pro Mini** | **1** | **180** |
| **ESP8266 (01)** | **1** | **220** |
| **Current Transformer** | **1** | **125** |
| **5.1V Zener Diodes** | **2** | **6** |
| **BTA-04 600B** | **3** | **150** |
| **MOC3021** | **3** | **45** |
| **Full Bridge Rectifier** | **1** | **16** |
| **EL817 Optocoupler** | **1** | **4** |
| **LM311 Comparator** | **1** | **15** |
| **NPN transistor 2N2222A** | **1** | **1** |
| **Diodes, Resistors, Capacitors** | **33** | **50** |
| **Terminal Blocks** | **7** | **28** |
| **PCB** | **3** | **250** |
| **Headers** | **1** | **10** |
| **Total** |  | **1100** |

**Table 6.2: Cost of the tools used for this project.**

From the table above, we can see that the total cost of a single unit comes to 1100tk only which is quite cheaper than the existing solutions for the home automation in Bangladesh at present. At the initial stage of planning this project we kept in mind some features our system will provide. One of those features would be to make a cost efficient system which could be affordable for the people to buy our product. Throughout the project we had tried to minimize the cost as much as possible and at the same time making sure our circuits meets their demand and work efficiently.

We believe that we have successfully minimized the cost and at the same time tried to make the system simple so that it can be easily implemented practically in Bangladesh.

**6.3 Future work**

Some of the future developments of our IoT based Home Automation system are listed below:

* Security issues need to be sorted. For example, password protected module.
* Using MOSFETS instead of TRIACS for better efficiency.
* More features to be added such as, motion sensors, cameras and Artificial Intelligence.
* Make it more optimum for LED lights.
* Make it modular. User can add on more units to existing ones under the same network.
* Implementing power factor correction for energy saving applications.

**6.4 Limitations**

Our system has some limitations as well. These limitations are as follows:

* Not compatible with CFLs and regular LED bulbs.
* No security features have been added to the web server as of yet. At the moment, there is no authentication system implemented, so the whole system is prone to security risks.
* This module is rated for 240V, 4A AC power systems only.

**6.5 Conclusion**

As IoT is bringing new technological changes in our daily lives and making our lives comfortable, so this IoT based Home Automation system can also help users to make their lives simple and convenient. This design will be highly demanding in the near future as our country is becoming a developed day by day and in that case everyone will become very busy with daily work. This design will enable people to automate their homes having remote access to the appliances. We are looking forward to adding some security features to our system, also, to diversify this project we can add some other extra features such as; motion sensors, cameras, Artificial Intelligence etc. We made our system simple so that the ordinary people can easily understand the concept and be able to operate this system. Our built product will be quite affordable for users than other existing solutions of home automation system in this country.