**EE356: Electronic Product Design and Manufacture**

Solar Powered Smart Lighting System

Project Proposal

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**Project Proposal**

Title :Solar Powered Smart Lighting System

Introduction :

With advancement of Renewable technologies many cities, urban areas have adapted Solar powered lighting systems for Street lighting, outdoor lighting etc. It optimizes the operation and maintenance cost compared to conventional lighting system.

Solar tracking is a method used in Solar power generation industry to track the sun light. Due to the increased direct exposure to solar rays this method is able to generate 30% - 40% more electricity compared to stationary ones. This method is widely used in large solar plants. But this method isn’t yet used in lighting systems.

In Our product we are looking to kick start to bring solar tracking methods with using fewer components and low cost to a simple solar powered lighting system. With this we can optimize the solar power generation and cost in a solar powered lighting system. On top of Solar tracking method product comprise of additional smart features like automatic light ON and OFF, Movement detection, USB charging and sleep mode.

Product Description :

Specifications

* BODY  
  Dimensions 530\*280\*200mm  
  Weight 4.9kg
* Power:
* Solar Panel:
* Battery:
* Charging time: 6-8hours
* Discharging time: 24-36hours
* Install Height: 3-5m
* Waterproof and anti-corrosion

Functions

* **Solar Tracking** Tracking of sun rays for maximum capture of sun rays
* **Automatic ON/OFF** lights turning ON/OFF automatically
* **Movement detection** Detection of movement and
* **USB charging** Charging of Electronic devices using USB charging.
* **Sleep mode** Save power when during later night hours/When there is no movement.

Market Analysis

There are many solar powered lighting systems currently in the market. But neither systems have smart features like Solar Tracking in their solar panels or facilities like USB charging in a lighting system. So there is potential market for our product as it’s more efficient and more useful to the public than the existing ones.

Pros

* Maximum utilization of solar power
* No need of an operator as Automatic ON/OFF
* Useful features like Movement detection and USB charging

Cons

* Always needs a power supply needs for the Controller
* Cost

Methodology

This system has one degree of freedom. So, this solar panel rotates around the horizontal axis along the path of the sun. This system consists of 5 main components. The first component is the sunlight-sensing element which is used to track the direction of sunlight. For this project 4 LDRs will be used as the sunlight-sensing element of the solar tracker. The data obtained from the LDRs are input to the ATmega328 microcontroller then after processing those data, the servo motor rotates the solar panel for the maximum sunlight direction.

system that takes solar energy to charge a battery during the day and then uses this battery to light up the street at night. this system, automatically turning the LED bulb on at night and off during the day. We will also incorporate a battery protection circuit to protect the battery from over-discharge.

Diagram

Description automatically generated

**Proposed Budget**

|  |  |  |  |
| --- | --- | --- | --- |
| Part | Unit Cost (Rs) | Number of Units | Total Cost (Rs) |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
| **Total Cost** | | |  |

**Time line**