Smart Lighting System

EN1070-Electronics Product Design and Manufacture
Design Project-Progress Revies
Group 31 – Creative Thinkers

Problem Description…

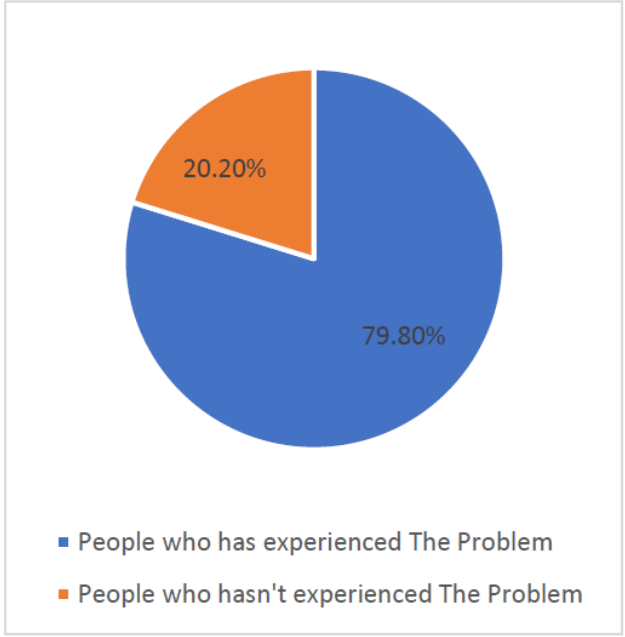
- Two wide-ranging trends in society today are urbanization and consciousness of sustainable development.
- Street lighting is a major fact when considering the urbanization.
- In present, solar power is used in most of the public lighting systems.
- But we can see that there is a huge power lost there.

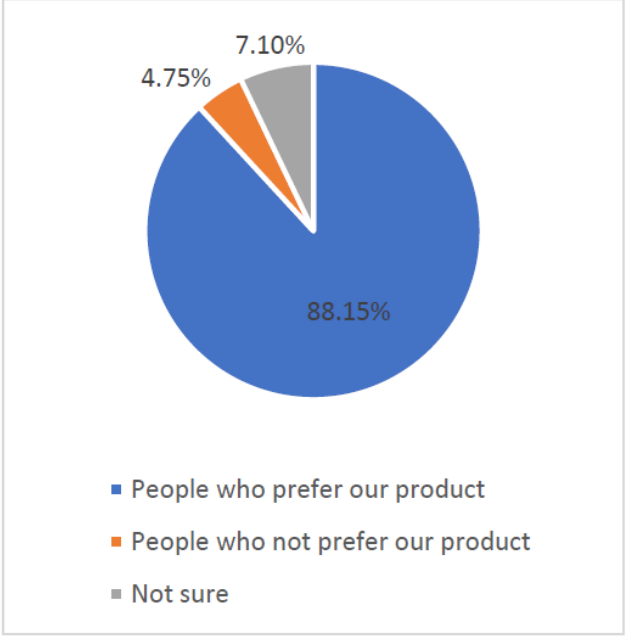
- Here, solar power is stored in solar batteries in the daytime and power up lighting systems at night.
- But, when storing solar power, there are some limitations and sometimes mostly on rainy days solar power is not there and this can be a great issue.
- Mostly in roads, walking paths the lights are switched off at about 4 am or sometimes even before. But we don’t know about it as most of us are sleeping.
- There is no use for lightning when they are not wanted to.

Justification…

- We did a survey to get an extensive idea about this problem. Here we mainly focused on mid-aged people.

Survey Results





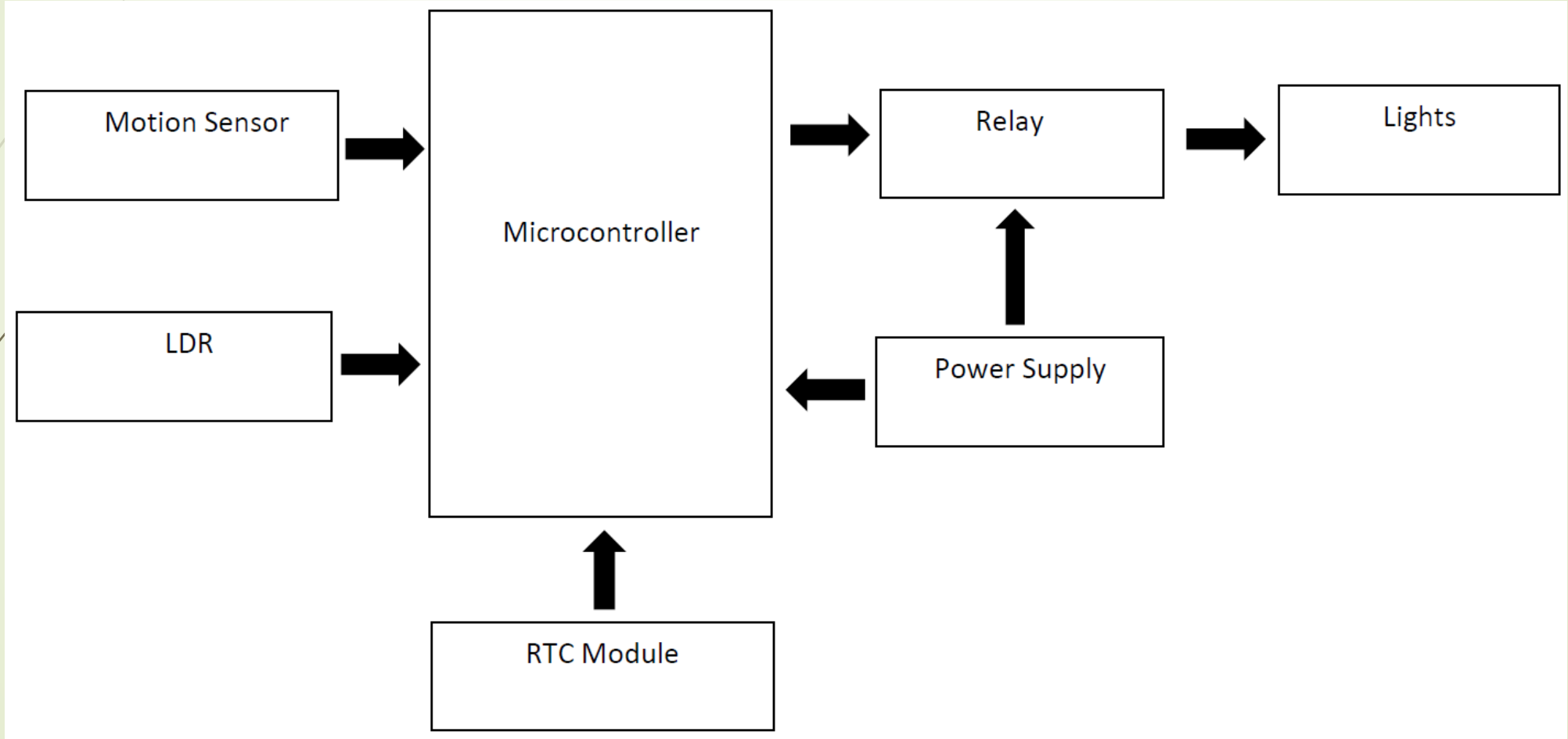
Solution…

- We decided to create a lighting system which is switched on only when a movement occurs around.
- By using this method for lighting systems in public areas such as parks, walking paths, we will be able to save a huge amount of power and money

Technical Feasibility…

- We have to use motion sensors and LDR to take input and we have to design a control system this is our task as a team.
- In designing part, we have to get some knowledge about microcontrollers, Altium designer, and some applications like proteus for our simulation.
- Every elements we need can be found from the local market.
- The reachable target is mostly depending on how we program the microcontroller and designing the circuit.

Product Architecture…



- Motion Sensor

  Detect the motions in the area.
- LDR

  Use to identify the light intensity of the environment (day or night).
- RTC Module

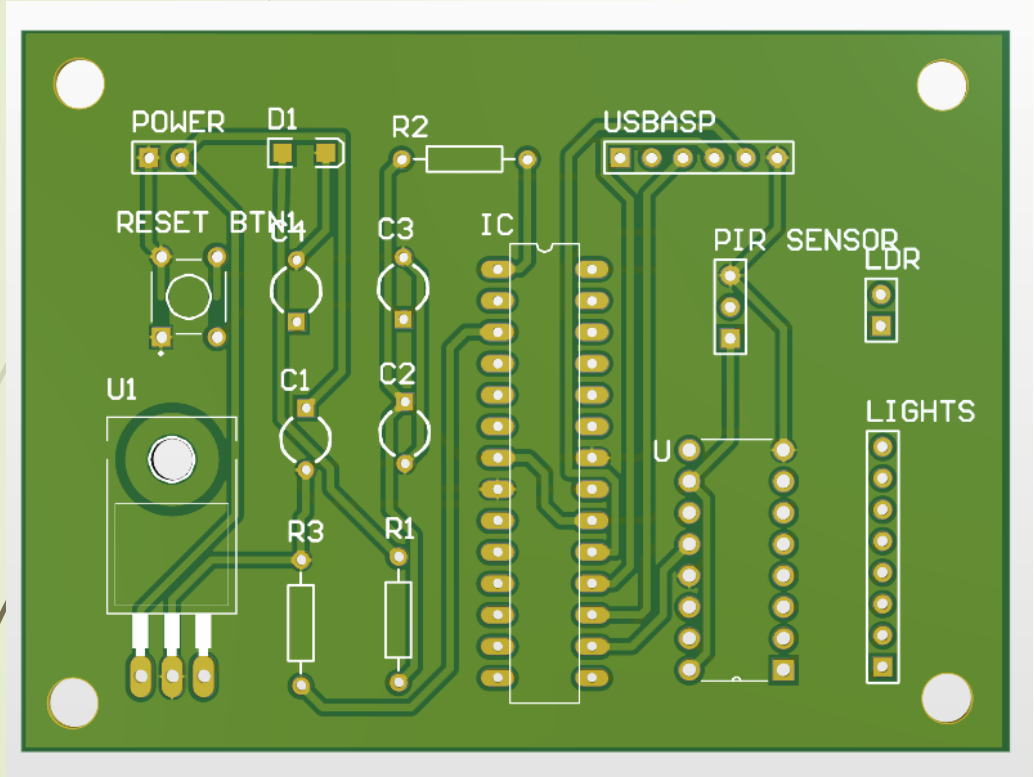
  Count down the time.
- Microcontroller

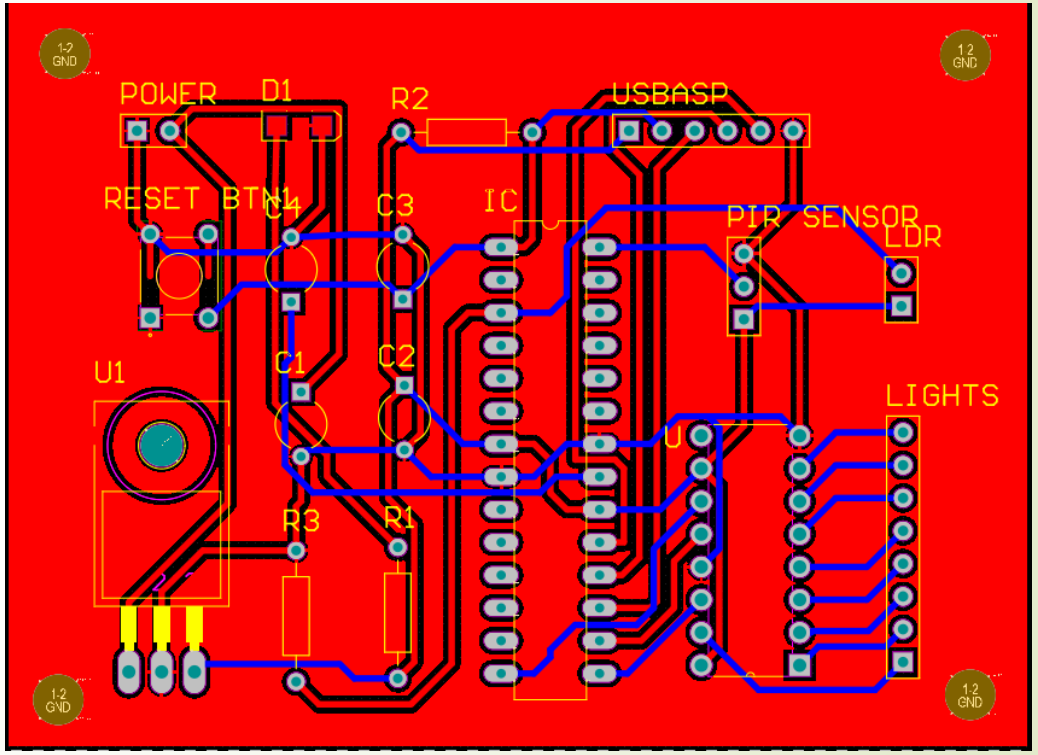
  Control the lights and lighting time by getting the data from the Motion sensor, LDR and RTC.
- Power Supply

  Used to Powerup the Microcontroller and Lights. If the power source is a solar-powered battery, we need a step-down regulator to power up the microcontroller and other components. If the power source is an AC supply, then additionally we need to rectify the input voltage.
- Relay

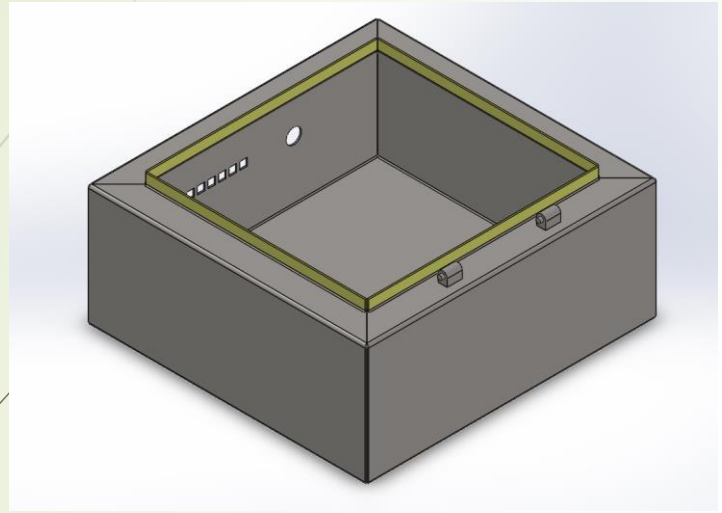
  Relay is used to power up the lights according to microcontroller output.

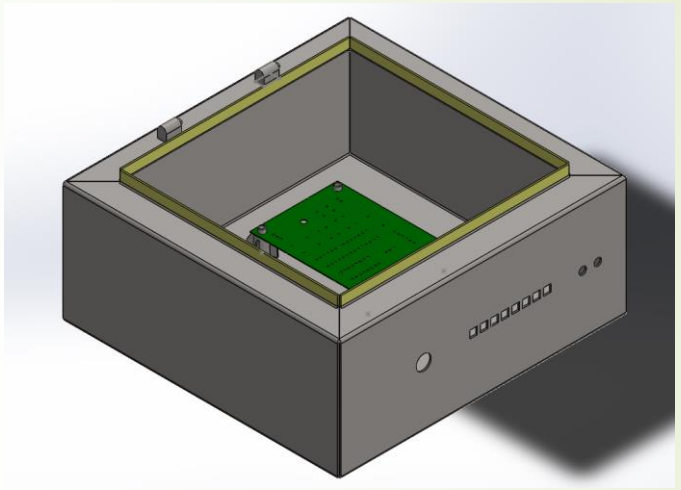
PCB...

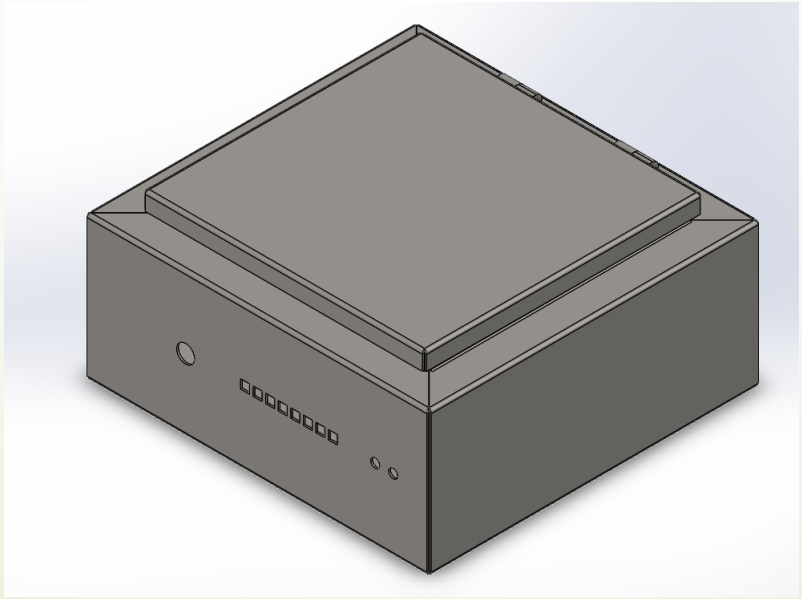

POWER
D1
R2
USBASP
RESET BTN1
C4
C3
IC
PIR SENSOR
LDR
U1
C1
C2
U
LIGHTS
R3
R1


1-2 GND
1-2 GND
POWER
D1
R2
USBASP
RESET BTN1
C4
C3
IC
PIR SENSOR
LDR
U1
C1
C2
U
LIGHTS
R3
R1
1-2 GND
1-2 GND

Enclosure…







Project Budget…

Components	Price (LKR)
• Motion sensor	220
• ATMEGA 328P	330
• RTC Module	140
• LDR	50
• Relay	130
• PCB	500
• Resistors and capacitors	100
• Others (soldering wires etc.)	200
Total	**1670**

Thank You...

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