Sustainable Campus

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Overview

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Problem Statement

- Penn State's University Park campus is a small city with little to none sustainability. Each year a great amount of electricity is used throughout campus. The cost of Penn State's electric bill alone is $17,409,222. It is imperative that a concept is designed to help lower the amount of electricity used throughout campus.

Mission Statement

- Using the research gathered on the concept of Sustainable Cities, the team will design a product that is energy efficient and will lower the amount of electricity used on campus.

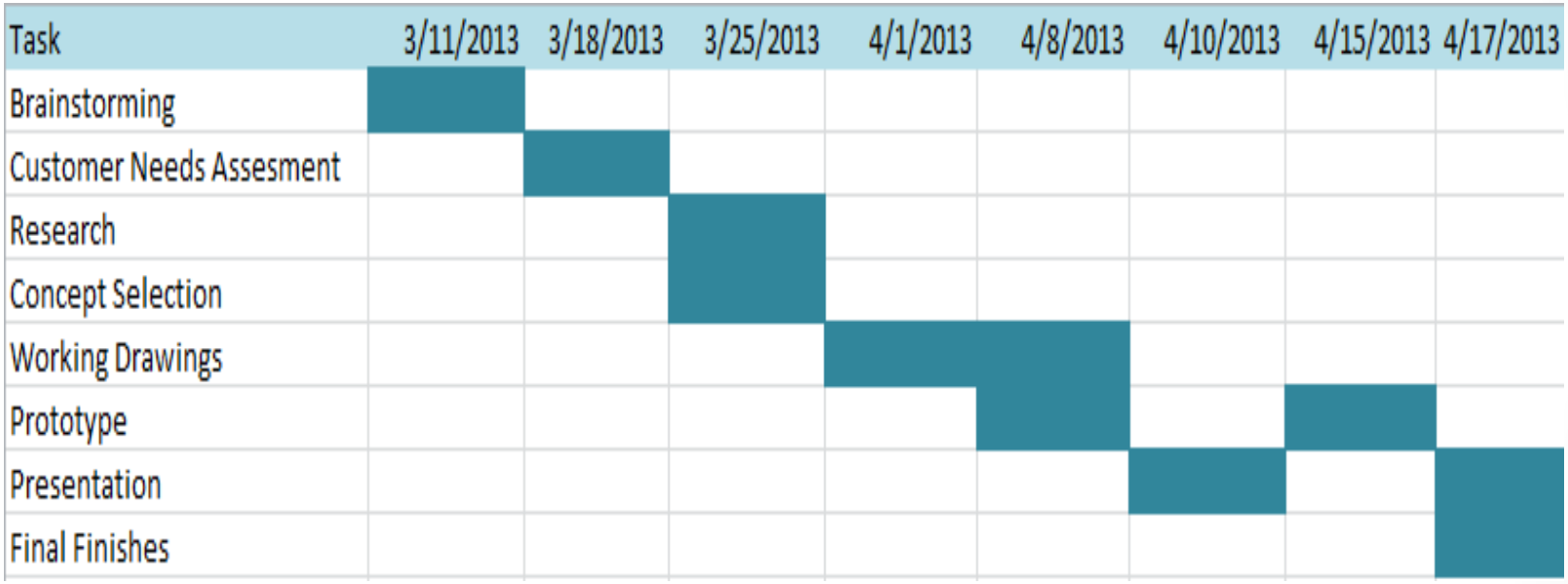
Design Specifications

- Fit in the guidelines of sustainability
- Cost and energy efficient
- Lower’s the campus’s electric bill
- Easy to implement throughout the campus

Team Solution

- Install specialized motion detectors that can accurately detect and count the number of people who enter and leave classrooms. When the counter reaches zero it will shut off all the lights and other devices that do not need to continuously stay on.

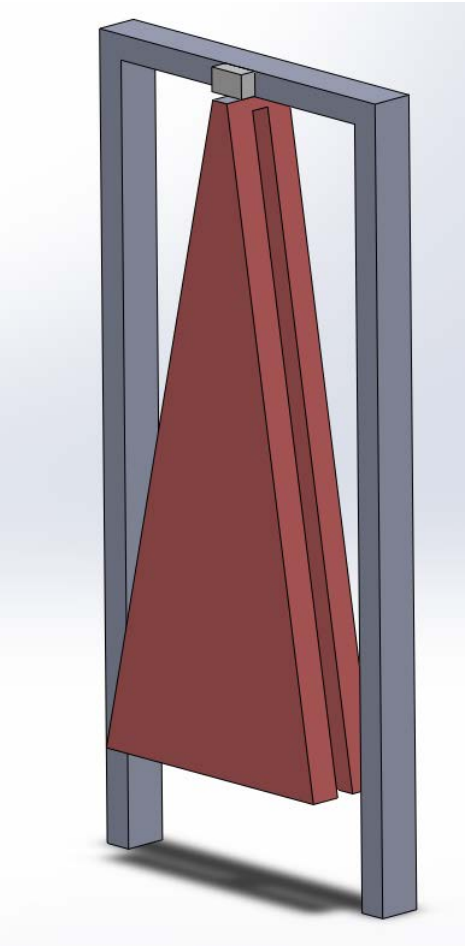
Gantt Chart


Task
3/11/2013
3/18/2013
3/25/2013
4/1/2013
4/8/2013
4/10/2013
4/15/2013
4/17/2013
Brainstorming
Customer Needs Assesment
Research
Concept Selection
Working Drawings
Prototype
Presentation
Final Finishes

Design Matrix

Factor	Sound Power	Water Recycling	CATA Power	Waste Energy	Recycling Points	Power Saver
Cost	-	0	0	-	0	0
Efficiency	+	+	0	+	0	+
Need	0	0	-	0	0	0
Public Health/ Saftey	0	0	+	0	0	0
Environemntal impact	0	0	+	0	+	+
Ease of Manufacture	-	-	0	-	0	+
Feasability	-	0	-	-	+	+
total -	-3	-1	-2	-3	-1	0
total +	2	1	2	1	2	4
Total	1	0	0	-2	1	4
Rank	5	2	2	6	5	1

Prototype



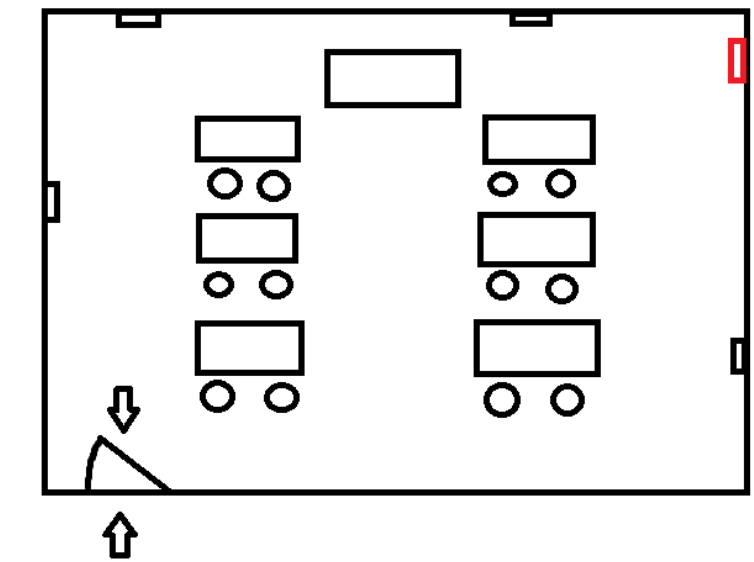


Photo Key:

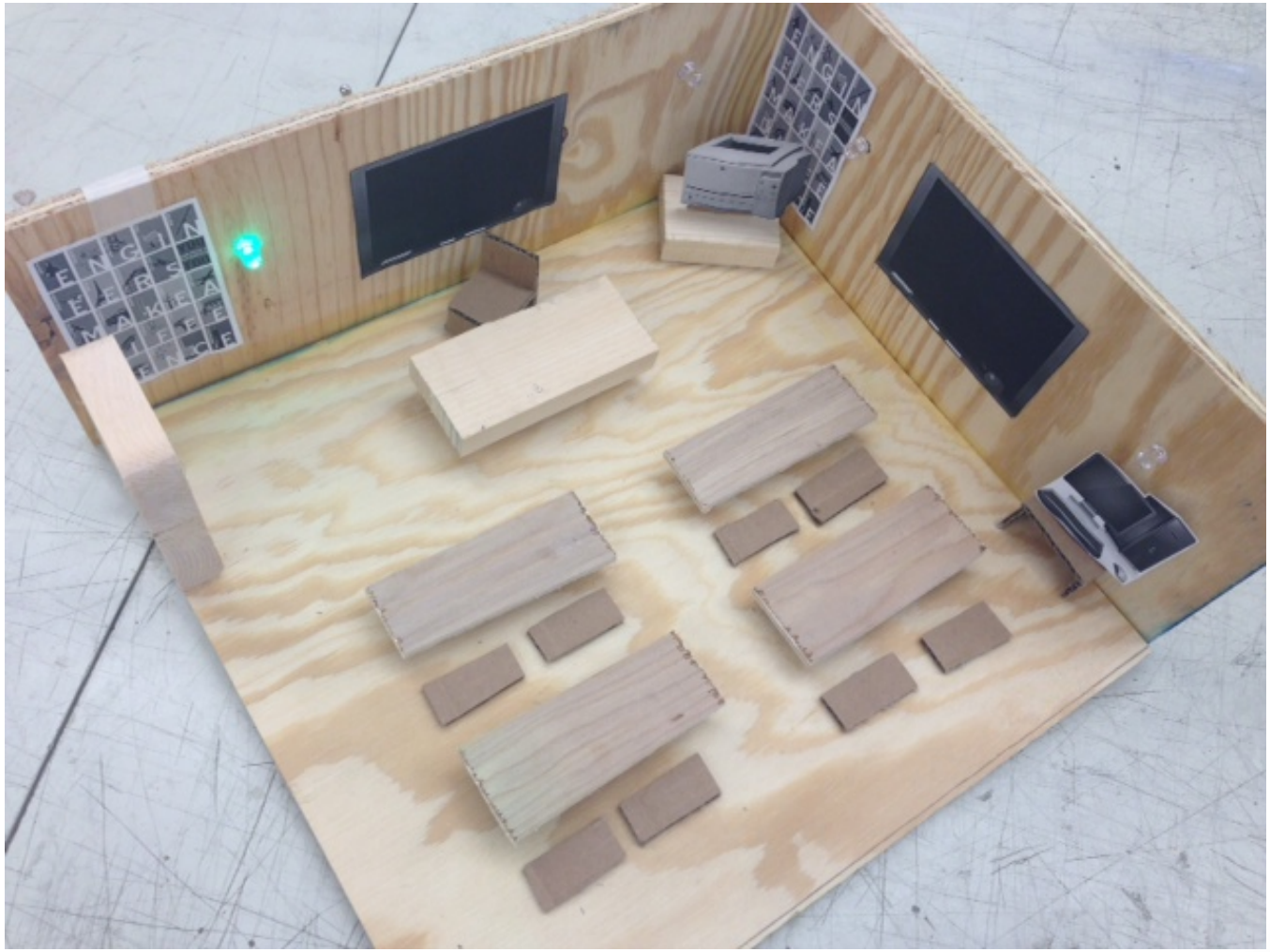
- Doorway with sensor

-Desk/Chairs for room occupants

- Circuit for regulated use

- Emergency/Essential circuit

Prototype cont.



Materials & Cost Analysis

- Sensor used – Accutrac Series PC-VID3-2.5-N
  - Very reliable and accurate
- Initial cost is relatively low
  - Easy to install
- Long-lasting, little to no maintenance needed
- May require supervisor for system glitches
- Could use lower-quality sensor
  - Would require more maintenance and supervision

Implementation Plan

- Small-scale test in various locations and room types
  - Computer lab, classroom, residence commons
- Depending on the effectiveness of the tests, install system where efficiency and savings are beneficial to the university

Thank you!

Any questions?

Team One would like to thank Siemens for sponsoring this project.

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