School of Engineering Science
Simon Fraser University, Burnaby BC V5A 1S6
mpc8@sfu.ca

September 19, 2011

Professor Mike Sjoerdsma
School of Engineering Science
Simon Fraser University
Burnaby, British Columbia
V5A 1S6

Re: ENSC 305 Project Proposal for a Solar Panel Cubic Charger Accessory

Dear Professor Sjoerdsma:

The outline of our project, Solar Panel Cubic Charger Accessory Proposal, for ENSC 305 is attached. Our purpose of this design is to allow the consumer to have a solar panel charger at all time without losing fashion over convenience. By implementing the solar panel onto a cube, not only will the current temperature be provided, it can be stretched to act as a solar panel charger for all sorts of devices.

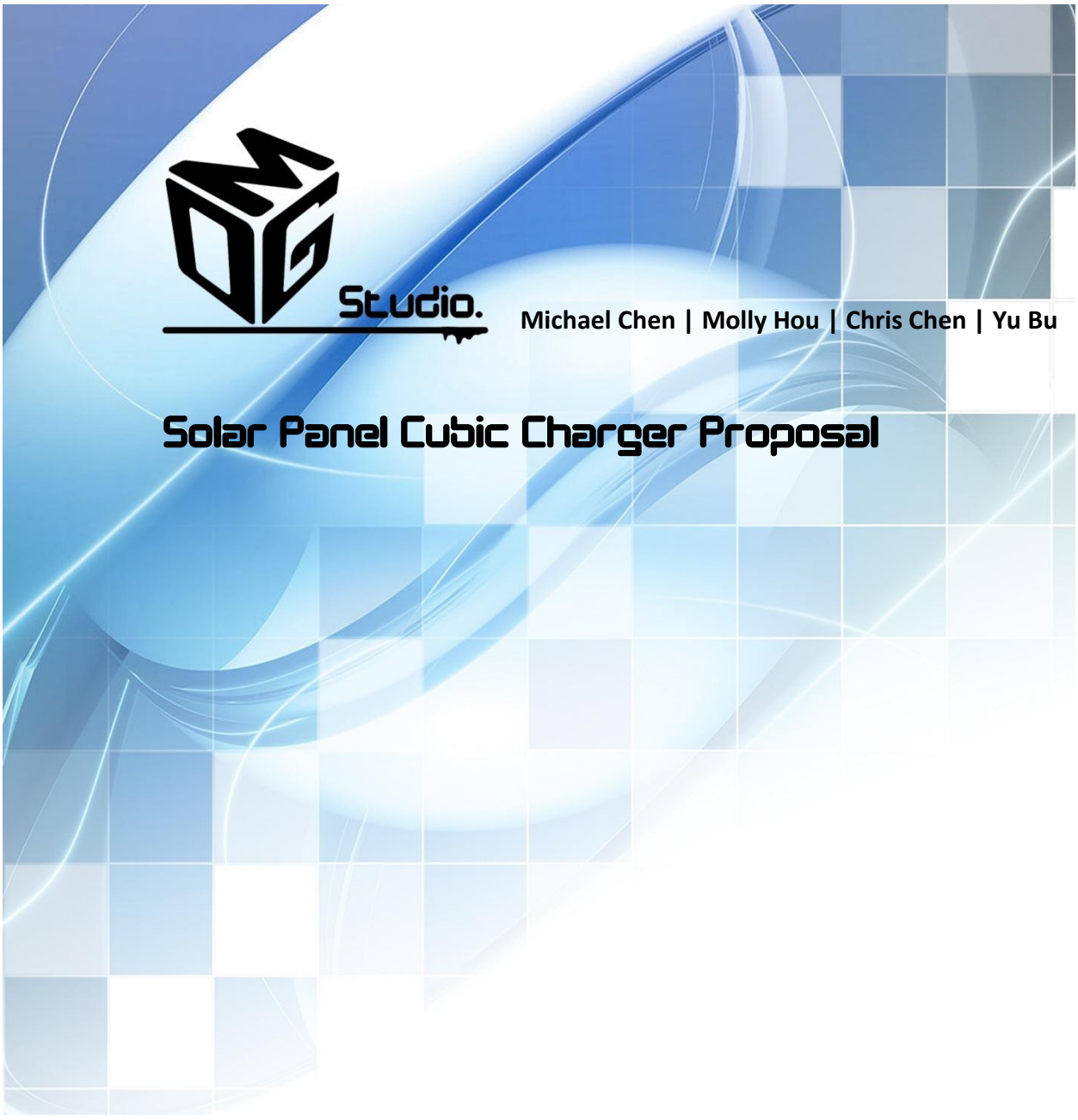
In the proposal, overview of the project will be discussed: Design Stages, Technical Specification, Scheduling and organization, Funding, and Potential Market. Lastly, possible usage of this technology will be briefly introduced.

OMG Studio consists of four ambitious and innovated third-year engineering students: Michael Chen, Molly Hou, Chris Chen, and Yu Bu. If you have any question or concern about the proposal, please contact me by phone at (604)780-9199 or by e-mail at mpc8@sfu.ca.

Sincerely,

Michael Chen
President and CEO
OMG Studio

Enclosure: *Solar Panel Cubic Charger Proposal*



Michael Chen | Molly Hou | Chris Chen | Yu Bu

Solar Panel Cubic Charger Proposal

Contact Person: Michael Chen
mpc8@sfu.ca

Submitted to: Professor Mike Sjoerdsma
School of Engineering Science
Simon Fraser University

Issued Date: September 19, 2011

EXECUTIVE SUMMARY

> ***Entry 1: Scott W.'s Olympic-size Battery Fail***
> *This February a man named Scott W. was travelling from his hometown in Toronto to Vancouver for the 2010 Olympic Winter Games. He was texting, and listening to music while waiting for the flight to board. He then got on the plane only to find out that the live-tvs won't be functioning for the 5 hours due to some maintenance issue fleet wide, therefore he planned his ration of the battery for the flight. Arriving in an unfamiliar part of the country, not knowing the part of town his friend worked, GPS was fired up. However, the battery starts to diminish by the seconds. Brightness dimmed, 3G turned off, and nothing mattered, the phone died. He then finds himself in downtown Vancouver with several hundred thousand people trying to meet up with my friend. The clock was ticking and the Opening Ceremonies was only hours away and there he was with a dead phone. A chance to see an Olympics Opening Ceremonies is one of those once in a lifetime experience and there was a dead battery in his way.*

Nothing is more depressing than cell phone dying or dead. As society grows and technology advances, cell phones become a daily accessory. Not only is it used as a communication device but also as a personal digital assistant for multi-tasking. Multifunctional cell phones have a variety of handy functions that consumes a great amount of battery such as: camera, GPS, Web surfing and music player. According to a global market study by TNS, over 75 percent of cell phones and PDA users in the U.S. averages "two-days of battery life during active use".

For some people, they do not pay attention on their battery life and simply forget to charge it. Even with a charger on you, it is sometime difficult to locate a power outlet to charge your phone, especially in parks or foreign countries. Furthermore, there is no standard voltage and frequency throughout the world. Plugging into a socket with the wrong voltage or cycle can cause electric shock or even a fire. Different countries might have diverse variety of plug shapes, holes, sizes and sockets. It would be too tedious and expensive to purchase different kinds of plug adapters before taking a trip to another country.

This document proposes developing a solar charger that will charge cell phone or other small devices without the need of having a power outlet. The screen on the charger will also indicate the battery level and the temperature. Using environmental beneficial device, the user will save time and money.

OMG Studio consists of four third and fourth-year engineering students with wide variety of experiences. The expected completion date for an operational prototype is Dec, 2011. The cost for the entire project will be shared among our group members.

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Introduction

"Is there an electric port somewhere? My phone is running low" – This is an everyday line you hear, whether on the bus or outside in a park. Battery is one thing phone company use as one of their promotions lines – smaller, longer lasting talk time. However, as long as the battery can last, it will not last forever. At some point, you will run out of battery.

Similar device in the market at the moment simply does not provide enough energy for the user to charge their phone. It will take not only an hour or two, but it will take as long as half a day. This is not acceptable. The objective of our project is to create a portable device that will allow the user to charge the phone within a reasonable amount of time anywhere you go.

While carrying the device, there will be a screen that shows the current temperature as bonus. Most importantly, it has the capability to act as a universal phone charger. Depending on the model of phone you carry, simply switch out the tip and you are ready to go. The device itself carries a battery in order to retain additional energy when required. Not only will the battery provide greater efficiency when charging the phone, it can be used to charge the phone when the night is dark without sufficient sunlight. If you feel that the charging speed is not at its optimal rate, all that is required will be for you to expand the device so maximal surface area will be exposed to absorb energy.

This document is a proposal providing the general idea of the device, steps of the design, funding of the project, and team management for scheduling. Detailed scheduling is provided as Gantt and milestone charts. There might be some date changes, but we will stick to the plan as much as possible to make sure we will have a working prototype at the end of this term.

2. System Overview

Figure blow shows the basic overview of the product's features. The product will act as both a watch and a charger. When a phone is out of battery, this product will be stretched then connected to act as a charger by taking in solar energy.

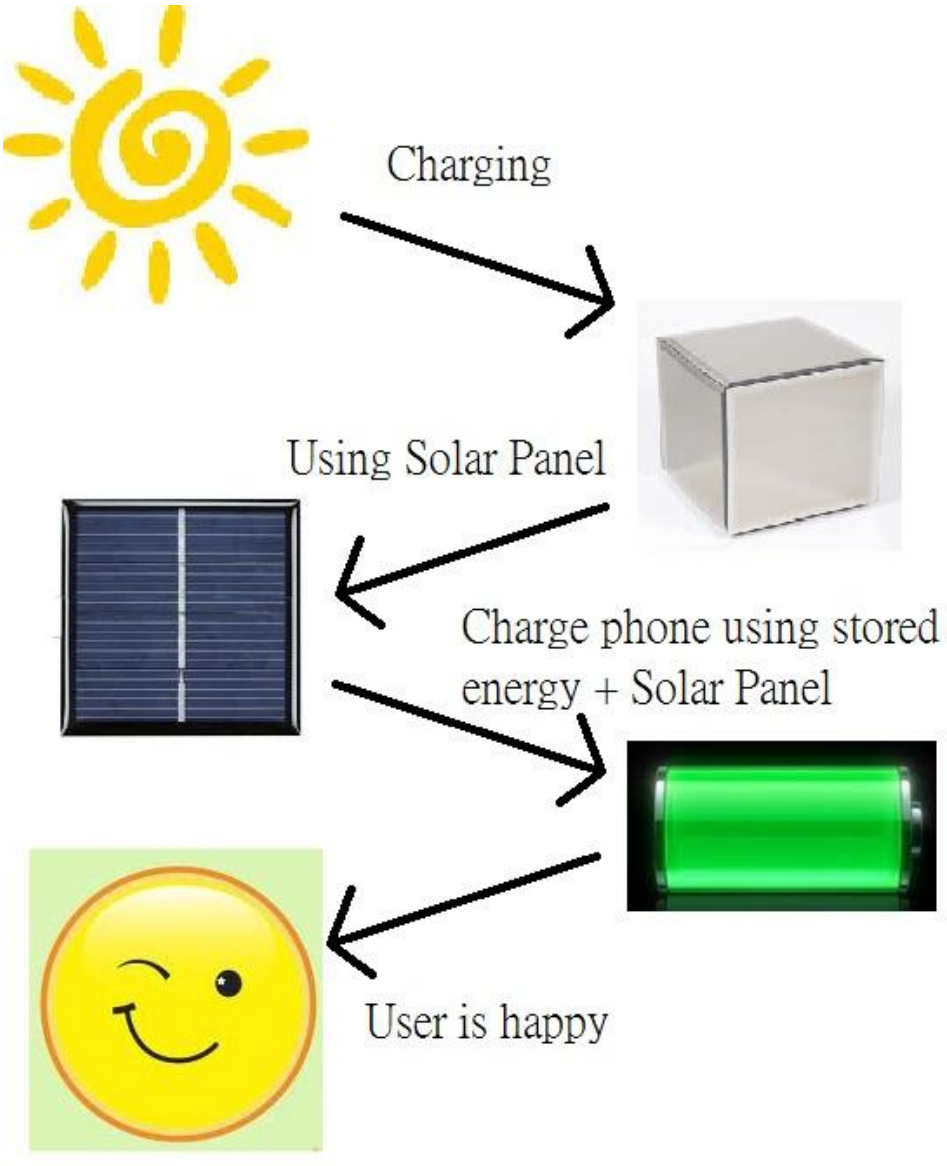

Figure 1 Function Overview

A simple flow chart is inserted below to help explain how the product behaves. The charger is used as an accessory while retaining solar energy. When it is needed to be a charger, the saved up energy will increase the efficiency for charging the connected device.

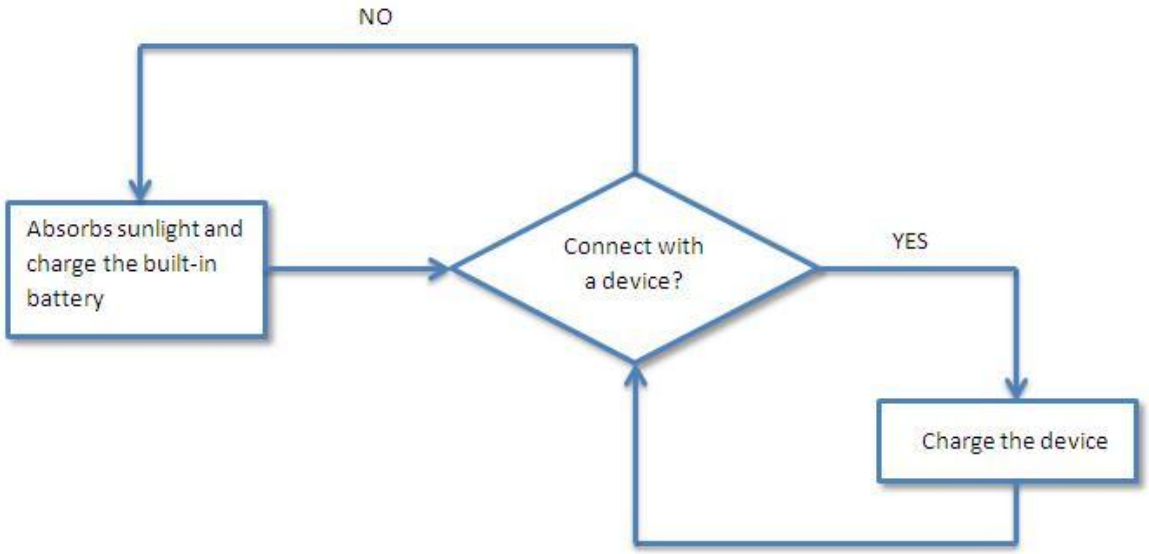

Figure 2 Flow Chart

3. Budget and Funding

3.1 Budget

Table 1 below shows a rough budget overview for the project. Components such as resistors, wires, and capacitors have been grouped under "Fundamental Components". Pricing for such parts are overestimated due to the large number of replacement happening during the implementation stage.

Table 1 Budget Overview

Components	Estimated Cost
Battery	$30
Solar Panel	$15
Electronic Screen	$10
Mini USB Port	$1.5
Thermal Sensor	$3.5
LEDs	$2
Casing	$200
Fundamental Components	$1
Advertisement	$0
Total Cost	**$263**

The cost for creating a molding and producing the final casing of our device is approximately $250. This casing will be manufactured in China, which is known for cheap but quality labor. With the molding created, reproducing the same product will be much cheaper compared to the initial cost. The remaining material fee for reproduction will be approximated at 10$ per piece.

The cost for advertisement is eliminated because we are planning to broadcast our product over the internet. Nowadays, internet is becoming a requirement in people's life. We intend to show our product through Facebook, Twitter and other social websites.

3.2 Funding

Since we have limited sources of funding, majority of the cost will be shared among our group members. The project itself is not expensive so taking care of the cost will not be an issue. However, designing the casing then producing it will be a separate scenario.

If the project progresses as scheduled, our group members will consider starting our own business for mass production. Due to the low cost in the accessory, generating funds should not be an impossible task.

4. Time Schedule

We have scheduled each group member with approximately equal amount of work throughout the whole term. Fig 3 and Fig 4 below are Gantt Chart and Milestone Chart respectively. Some date changes might occur for school purposes. However, we will keep tight to this schedule as much as we can.

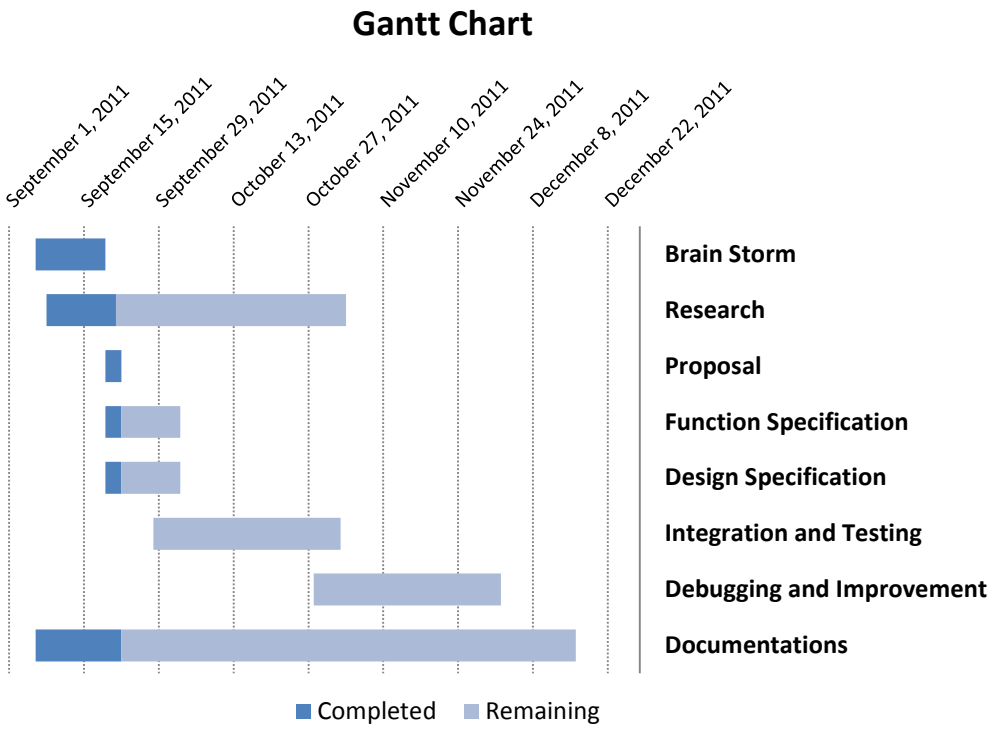

Figure 3 Gantt Chart for Fall 2011

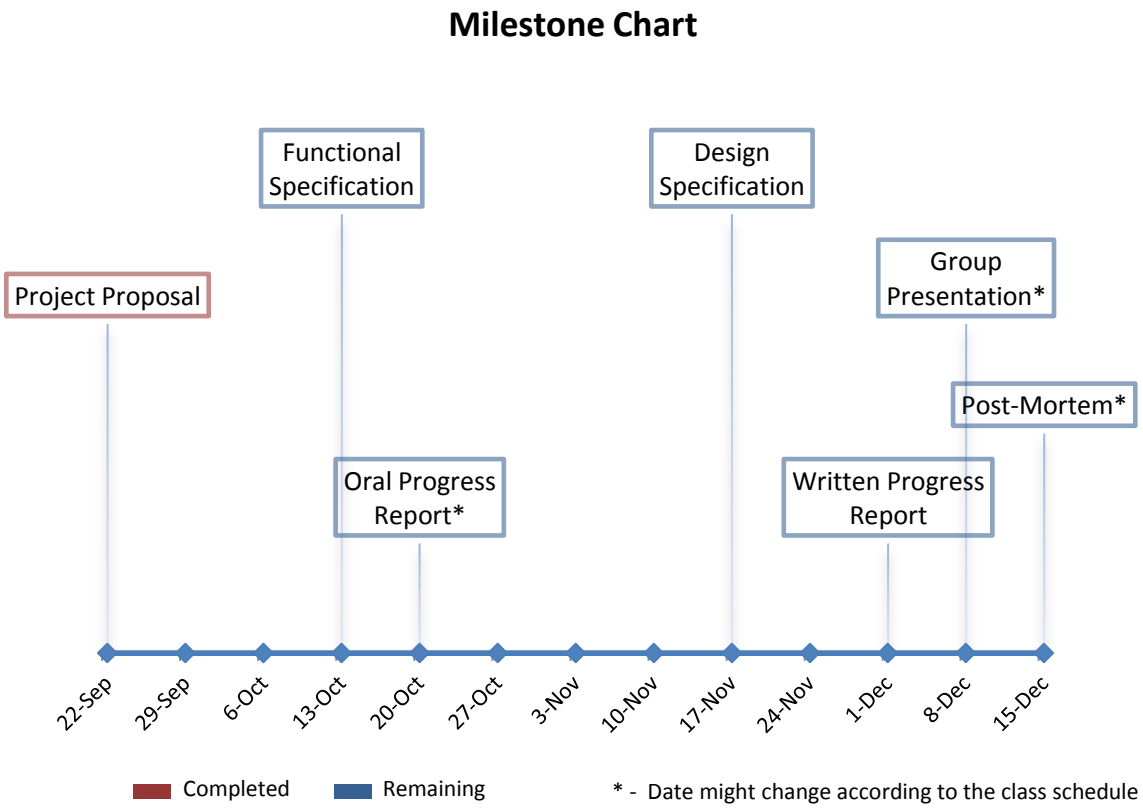

Figure 4 Milestone Chart for Fall 2011

5. Team Profile

Michael Chen – Chief Executive Officer (CEO)

My four years as an electronics engineer has equipped me with various skills and experiences. I have developed an extensive familiarity with various equipment and programming languages such as working with oscilloscopes, programming with VHDL, C++, and Assembly Language. More importantly, I developed the ability to seamlessly shift between working as a team or independently. Lastly, I have gained much experience coordinating my group projects and its members, as I have always strived to take on the role as the team leader.

Molly Hou – Chief Finance Officer (CFO)

I am a third year Electronics Engineering student at Simon Fraser University. Working with various assignments, projects and reports, I have built a strong knowledge with digital and analog circuits, C++ and Java programming, FPGA and embedded systems, along with the ability of analyzing and solving problems. Throughout many group projects and labs I have worked in during my university career, I have also learned to work individually and as a team. Being a financial advisor, I had the opportunity to develop the time management skills and design customized financial plans for various tasks. All of these skills will assist me to work and develop this project during this semester.

Chris Chen – Vice President of Operations (VP Operations)

I am a third-year Electronics Engineering student at Simon Fraser University with skills in both software and hardware. Though my academic years in SFU, I have gained various programing experiences such as C, C++, Java, VHDL and Assembly language. I have designed and built several circuits implemented with FPGA board and microprocessor. Also, I have some experiences related to artwork and animation using Illustrator, Photoshop and AutoCAD.

Yu Bu – Vice President of Marketing (VP Marketing)

I am a fourth year System Engineering student at Simon Fraser University with two co-op work experiences (Research Co-op at SFU and China Power Supply). Over the course of my education, I have performed various labs and executed projects which consisted of complex electrical circuits and theories regarding communication engineering. I am proficient in using Microsoft Office programs, MATLAB, and have an excellent understanding of programming languages such as C++, Java and assembly programming. In addition, I accomplished some tasks of design and modifying of haptic device during my previous research coop. I developed strong comprehension of fundamental knowledge of mechanical design and SolidWorks. Above all, I have good communication and team-work skills.

6. Conclusion

OMG Studio is determined to create a masterpiece that would diminish the needs of finding a power outlet. Not only will cellphone users feel safe with a portable charger around them, they will feel the accomplishment of saving the planet by using solar energy.

Our proposed device provides a much more efficient charging rate compared to similar devices currently out in the market. Furthermore, it has been designed carefully so both the function and the appearance will be close to perfection. This device will be guaranteed to become the next generation charger for all sorts of small devices.

The expected delivery date has been shown on the Gantt and milestone charts. We will be financially provided for the final outcome of the project as the cost is shared among our own group members.

It is our promise that by December 2011, Scott and all the phone users will be safe to consume all their batteries anywhere they go because they feel safe with the next generation charger by their side.

7. Reference

Google. (2011). Google. Accessed on Sep 19, 2011. <http://www.google.ca/>.

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