ENSC 305W/440W Grading Rubric for Post-Mortem

Criteria	Details	Marks
Introduction/Background	Introduces basic purpose of the project. Includes clear background and motivation for the project.	5 **/05%**
Body of the Document	Provides a high-level description of main functions and project modules. Outlines materials, costs, and schedule (both estimated and actual).	14 **/15%**
Problems/Challenges	Outlines major technical challenges encountered. Explains how these were resolved. Details any major changes in scope and design.	5 **/05%**
Group Dynamics	Includes a discussion of how the team was organized, any problems that arose, and how they were resolved	3 **/05%**
Individual Learning/Work-load Distribution Chart	Includes a one-page, individually written reflection upon what was learned from the project, both technically and interpersonally (each team member writes a page about their learning experience). **The workload distribution chart outlines major technical, administrative, and support tasks and indicates who participated significantly in those tasks.**	25 **/25%**
Conclusion/References	Summarizes outcome and evaluates the project. Includes discussion of future plans, if any (or explains why project will be abandoned).	9 **/10%**
Meeting Agendas/Minutes	Includes an appendix that provides all the meeting agendas and minutes produced by the team over the course of the semester. (NB. Neatness does not count here.)	18 **/20%**
Presentation/Organization	Document looks like the work of a professional. Ideas follow in a logical manner. Layout and design is attractive.	5 **/05%**
Format Issues	Includes title page, table of contents, list of figures and tables, and references. Pages are numbered, figures and tables are introduced, headings are numbered, etc. References and citations are properly formatted.	5 **/05%**
Correctness/Style	Correct spelling, grammar, and punctuation. Style is clear, concise, and coherent.	3 **/05%**
Comments		92

Simon Fraser University
8888 University Dr.
Burnaby, BC Canada

December 9th, 2013

Dr. Lakshman One
School of Engineering Science
Simon Fraser University
8888 University Drive
Burnaby, BC V6A 1S6

Re: ENSC 305/440 Design Specification for Smart Blinds System

Dear Dr. One,

Enclosed is a document entitled Post-Mortem for a Smart Blinds System. This document outlines the process our team went through as we designed and implemented our Smart Blinds System into a working prototype. We designed an improvement to conventional home and business window blinds by integrating a unique control system that offers users enhanced functionality and automation capabilities.

This post-mortem document follows the previous demonstration and presentation of our product that was held on December 3rd, 2013. The document details the current state of the device, deviations from our original functional requirements, and any future plans for our product. It also outlines the budget constraints and time management issues we overcame. Lastly we share our experiences we accumulated throughout the journey to create a working prototype of our design.

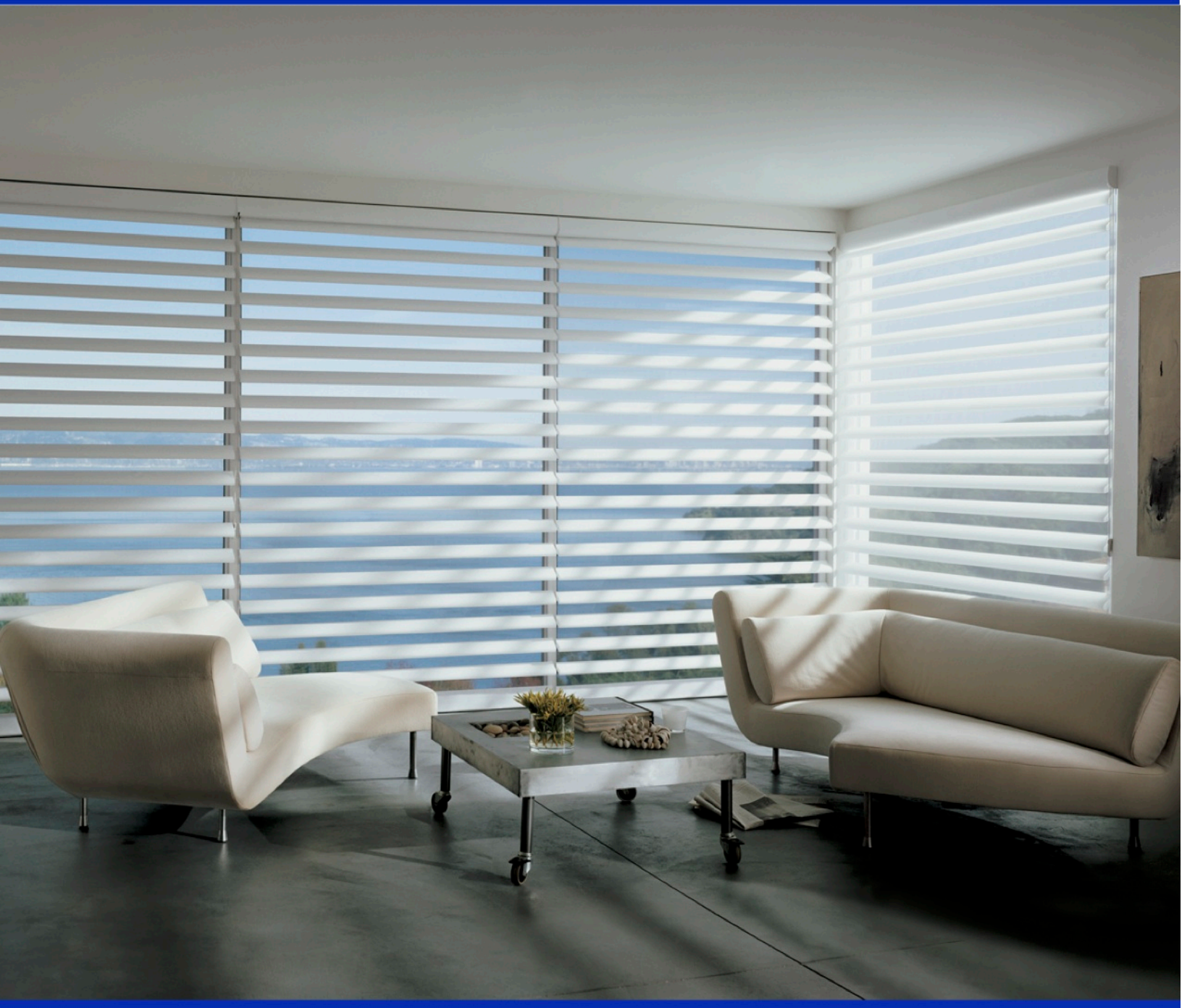
The BikoTech team consists of JordenBryer, ChamanToor, Willy Wong, and Clark Zhao. If you have any questions, please contact me by email at jordenb@sfu.ca.

Sincerely,

JordenBryer
President and CEO
BikoTech Automated Systems

Enclosure: Post Mortem for Smart Blinds System

BikoTech
Automated Systems



Post Mortem for

Smart Blinds System

BikoTech
Automated Systems

Project Team
Jorden Bryer – Chief Executive Officer
Willy Wong – Chief Financial Officer
Chaman Toor – Chief Technology Officer
Clark Zhao – Chief Operating Officer

Contact Person
Jorden Bryer
jordenb@sfu.ca

Submitted To
Dr. Lakhsman One
School of Engineering Science
Simon Fraser University

BikoTech
Automated Systems

Table of Contents

Introduction

The Smart Blinds System was designed to be a fully automated blind control system. The goal was to allow users to specify their own expectations for natural light entering their room, and to program specific times to open and close the blinds. Over the past four months our group worked tirelessly designing and implementing our vision for our product. Through hard work we were able to successfully demonstrate our prototype on December 3rd to our project's stakeholders.

This post-mortem document serves the purpose of allowing us to formally reflect on our project. In it we outline some of the deviations we made from the original functional specification, and how these deviations affected the result of our finalized prototype. We also detail our final timeline and budget we followed as we implemented our design. We end this document by discussing our own personal experiences and endeavours we faced as we followed this project through to its end.

Current State of the System

The system to date compromises a working mechanical and electrical system, with a microcontroller interfacing with our projects sensors, and driving our actuators to alter the blinds according to their surrounding light levels. The device itself is designed to blend in with conventional window blind systems. Its parts and control systems are integrated into the structure of the blinds themselves, utilizing the housing for the blind's gears for connections to our motors. These motors receive power from our Arduino Microcontroller that acts as the brain of our control system, receiving ambient light data as well as user inputs to achieve a fully functioning prototype.

The prototype of our product successfully achieved the following key features:

- Motorized blind lifting and tilting mechanisms to control light flowing into a room
- Ambient light sensing, allowing our microcontroller to obtain real time data on light conditions inside and outside the room
- Interactive software interface that allows users to program when or under what light conditions they want their blind system to open or close
- Aesthetically pleasing design with cords, motors, and other electrical components hidden from view

Problems and Challenges

words such as long and quickly have no meaning to your rader. Be more precise.

Some changes that we made to our final prototype that [illegible] specs are the solar charging circuit, and the audio alarm. We designed a circuit for the solar panel to hook up to our rechargeable NiMH battery, but it took too long to charge and discharged too quickly, since the motors required a lot of current. This lead to the battery voltage to drop below the threshold for the Arduino so the entire device was off. Another change we made was taking off the audio alarm, since we thought it would [illegible] did not add to the appeal of our project. An audio alarm ca[illegible] many users, and since most of us have phone alarms alr[illegible] to allocate the time and money in to implementing this into our system.

Why was it in your func spec then?

Other challenges mostly involve the timer and lift mechanism. The timer functioned on a 24 hour clock and we had to convert that into a 12 hour clock, which lead to some confusion to when AM switches to PM, and that the 24th hour is the same as the 0 hour of the next day. This was sorted out after extensive debugging and the current version of the code keeps time correctly. The lift mechanism was the other challenge. Initially the string wasn't winding properly into the spool, and keeps slipping underneath. We tried to fix this by placing a rod across the blind housing to prop up the string, but this created a sharp angle and increased the friction and torque required for the motor. We fixed this by moving everything back towards the edge and added a roller on the rod, which lessens the angle and reduce the friction. Another problem with our lift mechanism was that it operated on a timer, which is hard to control since the lift time varies depending on the state of the battery. For future designs we will definitely consider a switch or sensor that the bottom of the blinds will trip when going up or down.

Budgetary and Time Constraints

We proposed our project to the Engineering Science Student Endowment Fund committee and were able to acquire $500, which exceeded our proposed budget. We left $100 for contingency fund in case of the necessity of purchasing another microcontroller. Overall, we have spent $403 on our products excluding the parking tickets and TimBit and coffee.

Table x.1 Proposed and actual final budget

in $ I assume. Also include total.

	Propos	Cost
1 Inch Light filtering Blinds and Frame	66	
Arduino Mega 2560	80	70
LCD button Shield Kit for Arduino	21	26
Motor Driver Shield	28	30
Grove RTC	0	12
Light Sensor and Photo resistor	0	10
Servo	35	10
Motors (Step and Bi-Directional)	38	32
Medium Duty Solar Panel Batteries, Clips and cables	42	62
Speaker, Glue Stick, Prototype Board, and Bobbin	0	24
Housing raw materials, shrink wrap, cable	0	25
Solder equipment, flux, soldering wick	0	25
PCB Etching Kit	39	0
Joystick Shield Kit for Arduino	24	0

Even though we saved some budget by purchasing the equipment at a local electronics store and also didn't purchase PCB Etching Kit and Joystick Shield Kit, we needed to purchase some other materials that were not anticipated in the beginning but are necessary for the project plan as the time went on. Given the sufficient amount of fund, we had some liberty in terms of ordering and now looking back, we believe that our current prototype could be achieved with approximately $250.

Time Constraints

Below is our proposed and actual schedule for this project, given the time constraints, which are approximately 10 weeks in total, we are pretty satisfactory with our prototype design. It can be seen that we lacked a bit behind our proposed schedule and also we need to purchase parts throughout the projects.

We didn't include the time spent on the project reports, which are actually took a significant amount of the time for the projects. The functional specification and design specification reports took us a bit longer than expected to finish.

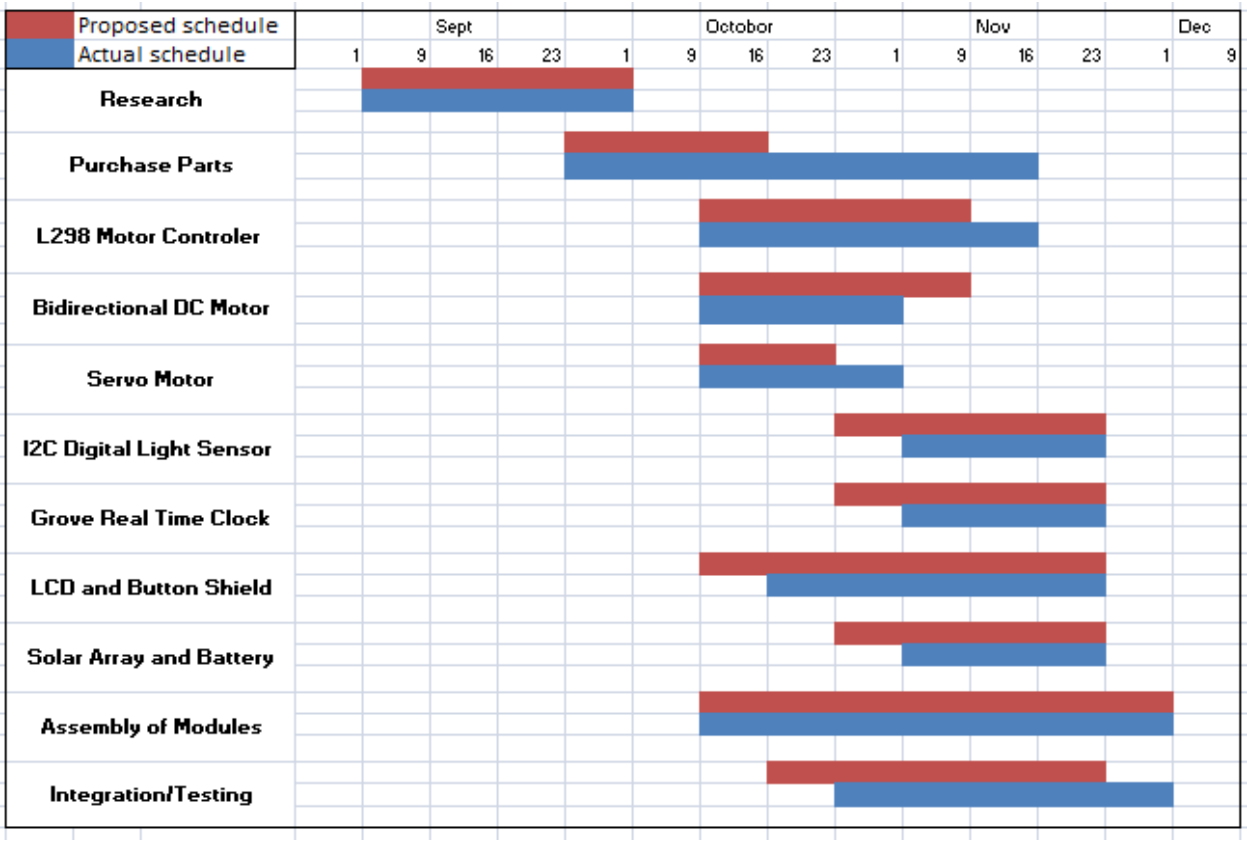


Figure x. Proposed and actual schedule.

Interpersonal and Technical Experiences

Jorden Bryer

Through ENSC 305 and ENSC 440 I've learned more than in any other course just how important team management is to a projects success. While in other courses the goals of the projects and labs are well defined, in ENSC 440 nothing to do with your system is defined for you. It is up to the group to define their project themselves and to make decisions that will hopefully lead to the best product possible at the end of the semester.

As CEO of BikoTech, it was my responsibility to organize meetings for our group and allocate tasks for each member to work on. It was also my job to always stay on top of the direction of the project, constantly thinking about what needed to be done next and by when to ensure we met our deadlines. As a group we usually met at school and once a week on the weekend to put together mechanical parts of our project, iron out problems we encountered, and to test the software progress that was made during the week. These meetings became more frequent and segregated as the semester went on as integration of specific components began. Allocating responsibilities was often difficult as this team's skills were primarily hardware oriented, while the project had a large software component.

Although we were successful in the creation of our prototype, I think this project could have been better executed had we more thoroughly researched our parts and materials. Having a more compact microcontroller, a better blind lifting system, or a working solar circuit are all things that could have been achieved or crossed off as unattainable very early on if we had researched these items in more detail. Also, had we realized earlier just how much software and mechanical skills were required for this project we could have tailored our group to better suit our objectives.

Clark(Gaopeng) Zhao

ENSC 305 and ENSC 440 are very beneficial to my career development before graduating and stepping into the real world. Basically we have worked as a small start-up company and have come up with our own product to solve an existing problem. There are definitely a lot of things I have learnt from this experience and are very different from that learned from other projects or co-op experiences. The importance of practical and detailed planning or scheduling is obvious in such a project. It involves the process of thoroughly researching and the understanding the strengths and weakness of each group member. But personally I think it is even more important to be able to adapt the schedule and rearrange tasks from time to time to fit the need of the current status of the projects.

Overall I am satisfied with the result and the process I went through. All the members are friendly and considerate of other people so we don't usually fight over any disagreements. The title of chief operating officer doesn't entail me the power which is second to the CEO, either it would be necessary within a four person team. Theoretically it was my role to monitor and report team activities and progresses to the CEO. However every person has taken part in the role of updating their tasks in actual or online team meetings. Therefore throughout the project I volunteered in maintaining and uploading meeting minutes. Besides researching in the early stage, I was also assigned the task of completing the software for the motor controller, which was then taken over by Jorden. Later in the project I helped investigating the solar array and rechargeable battery issues and testing and debugging our prototype product.

It is a memorable journey and I am very grateful for having such wonderful teammates. And I wish the all the best on the future life and career.

Willy Wong

ENSC 305 and ENSC 440 has been a fun and hectic experience. My work as CFO initially started with budgeting grants and focusing on the creative aspect of the project. I looked over all purchases made and decided where best to spend our funding. I also designed the company logo and colour scheme, as well as take care of most of the hardware and mechanical aspects of the project. Starting with the CAD drawings to determine the proper fit for the sensor and actuators. And helping Chaman with the blinds housing and staining the frame. Then physically putting the hardware components in the blinds and getting the circuit designed and soldered. After the design is done I help Jorden a lot in the testing and debugging department, breaking his code and suggesting improvements and added features. And when the blinds is ready for its frame and housing I designed the enclosure that would house the user interface. This was later 3D printed with the help from Jorden in Bonnie's lab. I also did the initial testing for the components individually, and making sure that the RTC didn't interrupt the light sensor signal. At the end of the project I went back to doing the final stages of testing, and filming a video log in case that the project fails to demo during the presentation. The most useful courses for me is definitely ENSC 387 and ENSC 489. In ENSC 387 we learned about sensor and actuators, so during the project I knew what kind of sensors and motors were needed. ENSC 489 also helped me in learning proper measuring techniques, and basic CAD design. I think overall our whole team cooperated well, and we made the best out of the time available to us. Some future improvements in team dynamics might be to split up the software more into individual modules which can be split amongst the team members easier.

Chaman Toor

One of the hardest things to do is, work together in a group with people you have never met. I joined a group in which I was not acquainted with two of the members of the group therefore had no idea what to expect in terms of work ethic or professionalism. All my worries were put to rest when I finally got the chance to properly interact and become familiar with them. Throughout this project I could not have asked for a better team, everyone was very accommodating of each others' schedules and the workload was divided fairly evenly amongst all the members.

Personally I believe that the Capstone project is a wonderful opportunity to polish your professional skills just before entering the work industry. I think that this is exactly what the Capstone project provided us with starting from the research aspect all the way to being able to present in front an audience. Some of the skills that I have improved upon are definitely important and help me to propel as a professional. Initially, I like the other members of my group starting conducting research on our project proposal. The research phase allowed us to identify what types of features we need to implement and just what type of market we are developing this project for. From the research phase we moved into the actual development, which involved writing software to interact the individual modules. My role in the software development was to implement the photo-resistor and the light sensor. Along with the software portion I also had a part in writing the all documentation required, the documentation was split evenly amongst all the members. One of the other things I was responsible for was constructing the wooden frame and wooden housing to hold the blinds and the electronic components together. As for the technical aspects of the project that was about it. However, the intangible items such as professionalism, organization, and being considerate were some of the other main things that I have strengthen due to success of this project. Overall, I think I would definitely work with this group of individuals again.

Individual learning/workload distribution chart

Jorden	Chaman	Willy	Clark
-Research **-Software** • LCD Shield • Real Time Clock • Fixing bugs • Integration **-Documentaion** • Equal portion in all documents	**Research** **-Software** • Photoresistor • Light Sensor **-Hardware** • Assembly of frame and housing • Testing rechargeable batteries **-Documentation** • Equal portion in all documents	**Research** **-Hardware** • Protyping • Assembling all electronic circuits • Auto CAD designs for documentation and LCD enclosure for 3D printing **-Documentation** • Equal portion in all documents	**Research** **-Software** • Testing • Finding bugs • Helping fix bugs **-Documentaion** • Equal portions in all documents

Conclusion

Since the semester is over and hence the course has also ended, we don't consider this to be the end of the project. We would, in the future like to proceed to the second stage of our prototype and add functionality that was omitted due to time constraints and resource constraints. Some other things we would like to do are to bring down the cost of the product to something more reasonable and something more marketable. In addition we would like to also include some production level features to further enhance the functionality of our product. Some of the missing features would include a solar charging circuit to make the system more self sufficient and an audible alarm. We also have plans to further improve upon the longevity and overall design of the product to make it even more compact and efficient.

All of us are very satisfied with the amount of work that we put into this project and considering that we only had three months to produce a working product we are indeed very happy. Some of the little things that really helped was the fact that every members schedule was accommodating in terms of other courses and members willingness to sacrifice weekends to complete this project. The dedication and hard work that went into this project did help indeed towards accomplishing our end goal(produce a working product). One of the other things that really helped was the fact that we had a contingency fund just in case anything went wrong. It really allowed us to work with more confidence knowing that if we damage a component we could afford to buy another one. Whereas, if this fund was not available to us we would have been very nervous about damaging parts and be constantly worried something was going to break. In conclusion, we just want say thanks to the following people for helping us when necessary.

Acknowledgments

- **Bonnie Gray - 3D printer**
- **Lucky One**
- **Mike Sjoerdsma**
- **Lukas-Karim Merhi**
- **Reza (350 TA)**
- **440/305 TA's**

Meeting minutes

Meeting Minutes

September 16th 2013
Present: Jorden, Chaman, Clark, and Willy
1. Announcements
ESSEF Proposal coming up – September 17th
2. Discussion
Action: create a short Powerpoint presentation where we discuss our project and give a cost break down.
Action: fill out the ESSEF proposal form and submit to the ESSS office.

Meeting Minutes
September 17th 2013
Present: Jorden, Chaman, Clark, and Willy
1. Announcements
Presented to ESSEF for funding.
2. Discussion
Presentation was 5 minutes with 5 minutes of questions.
Questions/Comments:
- Asked about existing software applications for controlling our system with an iPhone – they exist so we don't need to make one ourselves.
- Commented that we need to account for the window being in the way of our solar array.
- Asked how much power is needed to pull up the blinds or rotate their angle – something we still need to investigate thoroughly.
Action: We need to think about ordering parts as soon as we can as we likely won't get ESSEF funding for some time.

Meeting Minutes

September 23rd 2013
Present: Jorden, Chaman, Clark, and Willy
1. Announcements
Proposal draft is due tonight at midnight on Canvas.
Another source of funding is available through the Wighton Fund.
2. Discussion
We assigned our company positions (CEO, CFO, COO, CTO) so that they can be added in our Proposal Draft.
Wighton Fund is something we need to consider. They seem to prefer projects that have a larger societal benefit, especially biomedical applications.
3. Roundtable
Picked our company name to be BikoTech Automated Systems.
Willy designed a logo and letter head to use in all of our documents.
Content of the proposal was put into our office template and submitted on Canvas as our draft.
Jorden contacted Eric with the ESSS about signing out their Arduino Mega. Hope to get that part early this week.

Meeting Minutes
Sep 24th.
a. Proposal completed.
b. Need to inquire about parts available at the ESSS library.

Meeting Minutes
Sep 26th
12:30-13:30
a. Major tasks defined, including control, light sensor, servo/motor, blinds and the most important
Arduino Mega.
b. Parts that could be borrowed from the ESSS parts library.
c. Research during the weekends.

Meeting Minutes
Sep 27th Canvas Minutes.
1. LCD Button Shield:
https://www.sparkfun.com/products/11851
Week 4 Weekend Research v1.1 12:45 pm.
Chaman: LCD button shield interfacing with Arduino.
1. Videos or finished projects related to LCD button shield with Arduino.
a. How to LCD display
b. Display clock on LCD from the Arduino(we probably need to program a clock using it?)
c. Read and display user input from the button shield.(or touch screen?)
Willy:
1. Motor/servo interface with the Arduino.
a.How to control speed and directions.
b. power consumption?
2.Bonus:
a. solar grid to battery circuit.
Jorden:
1. Light sensor interfacing with the Arduino
a. Do we need circuit to read the light sensor input?
2. Power(Battery) needed for the Arduino to run all these sxxt.
Clark:
1. Audio with the Arduino.
a. Need extra speaker?
b. How much power needed?
c. how to play music?
Clark
Update for the meeting,
1. On Monday, we will get the parts from the ESSS library.
a. Lists that we can obtain in priority:

1)arduino mega 2560, 2 available
2)LCD Keypad Shield. 1 available
3)Motor (There should be some selections, DC geared motor/ need to pick one or two). What kind
of motor we need in terms of power, current?
4)Joystick. 1 available
5)Mini breadboard
6) 15A Motor Speed Controller.
http://www.amazon.com/CanaKit-UK1115-Controller-Assembled-Module/dp/B005UTBIV6should be this one.
b.They also have
1)wifi shield for Arduino.
2. Jorden suggested the projects being broken down to evolving targets.
1) Motored connected to Arduino powered by USB could open and close the blinds controlled through computer.
Components needed: Mega, Motor, Blind.
Reason: Basic function.
2) LCD Button Shield being integrated.
a. Use the button to control the blinds.
b. State/user instruction being displayed and controlled by the buttons
c.Clock being generated from the Arduino could be displayed on the LCD.
d. clock/alarm settings being controlled by the buttons.
e. Need to take into consideration of adding light sensor option in the following stages.
3) Add light sensor into the design.
4) Use battery to power the whole system.
5) Use solar grid to power the battery.
Welcome need more details for task breakdown at each stages.
I am struggling between complete one stage to the finest or complete whole design with basic function first.
Eg: which stage should we integrate the tilting of blinds. Same time when we design for the open and close? Or add this feature after we finish the main functionality.
Jorden:
I think we should make sure we can open the blinds fully and tilt them as much as required first before we connect anything else to the design.
In other words:
Arduino Mega + laptop with arduino program + motor(s) + blinds :
- connect the motors to the blinds correctly
- test that we can tilt the blinds to let in sunlight, and close them again using the motor
- test that we can open the blinds fully using the stronger motor
Once we have this the next stage will be to add in the LCD with the buttons into our design and program a simple UI that allows the user to close and open the blinds based on pressing a button or
selecting an option from a menu displayed on the LCD.
Then we will decide what to do next. (3, 4, or 5 in your list).
So to update the next step of our project depends on when ESSS gets back to us. They said the email should go out after this weekend ideally telling us to come sign out parts we need.

We want to at least get our hands on the Arduino Mega and an appropriate motor or two so that we
can test the most basic functions of our blinds. We'll also try to get the sheilds we want (maybe Wifi, Joystic/LCD if we like it). We should also buy the blinds now. ---> The Arduino Mega is 4 by 2.1 inches so we need blinds that can accommodate this (bigger and easier to open the better).
Chaman
So far, doing some research on the LCD shield this is what I've found:
1.) Documentation:
2.) http://linksprite.com/wiki/index.php5?title=16_X_2_LCD_Keypad_Shield_for_Arduino
3 .) LCD Library to program it. http://www.arduino.cc/en/Reference/LiquidCrystalThe parts list for the user interface:
LCD Shield- To display time and set alarm
Speaker- For alarm
Willy:
I've attached the template for all future documents in our files section. Please remember to print borderless. Jorden's signature is in there as well
Simple motors can be controlled by the Arduino without a motor shield. You just need the L298 motor driver. It can control speed and direction of the motor. There are Youtube tutorials on this.
http://electronicdesign.com/power/build-smart-battery-charger-using-single-transistor-circuit
The link above shows a simple smart charging circuit, it's AC but I think we can just remove the transformer and hook it up to the solar array. It has to be modified to suit our needs. But this is pretty nice since you can set the start and stop voltages for the charger.

Meeting Minutes
Oct 3rd.
1. Group went to shop for kits.
2. HomeDepot. => Blind
3. RP Electronics => Arduino Mega, motor shield, LCD button shield, 2 9v batteries, 2 DC motors,
1 step motor, battery wires, 7.2 v solar grid, etc.
1. Need to reimburse Willy's gas fee. :)

Meeting Minutes
Oct 5th
1. All kits checked.
2. Download Arduino software on Willy and Clark's laptop.
3. Run simples codes to control led light and step motor.
4. Discussed how to hook up the motor and the cords.
5. Step motor doesn't have enough torque, lame...
6. DC motors are quite strong, yet need to have little gadet to fasten the pull up or pull down of the
wire.
7. Willy to buy the little wrap-around for the motor
1. Chaman to bring his tool box for the meeting next time.

Meeting Minutes
Oct 10th

Thursday. Lab1 11:30 pm
1.Got back our project proposal, which is only 57%. Talked with Lucas and received feedbacks. The main reason we lost points is because we didn't follow the rubric, which was marked upon on.
Another reason is because we didn't follow a good example from previous years.
http://www2.ensc.sfu.ca/~whitmore/courses/ensc305/projects/2010/3func.pdf
2. We will follow the rubric and the example from Lucas's group to complete the Functional Specification.

Meeting Minutes
Oct 13th
Sunday. Lab1 10:30 pm
Assigned roles for functional specification.
1) http://www2.ensc.sfu.ca/~whitmore/courses/ensc305/projects/2010/3func.pdf
2) http://www2.ensc.sfu.ca/~whitmore/courses/ensc305/projects/2010/7func.pdf3)
3) Here is the list of sections that need to be completed and who's doing them:
End Formatting:WIlly
Cover Page:Willy
Contact Page:Willy
Table of Contents:Willy
List of Figures:Willy
Glossary:Jorden
2. System Requirements:Jorden
3. Lift Mechanism:Chaman
Lift Mechanism Drawing:Willy
4. Blind Tilting Mechanism:Chaman
Blind Tilt Mechanism Drawing:Willy
5. Electronic Hardware:Clark
6. User Interface:Clark
7. User Documentation:Clark
8. Test Plan:Jorden
Test Plan Drawing:Jorden
9. Conclusion:Jorden
10. References:All contribute References, make sure to cite when you use them
4)Chaman brought his tool box
5) Cut curtain short on the edges
6) Need to design menu and sub-menus on the LCD interface with push buttons
7) Need to purchase extra digital clock since the Arduino only shows clock when the unit is usb connected to the computer and would be reset following the push of reset button
1)Team members will submit their revised functional specification onto canvas

Meeting Minutes
Oct 16th
Wedenesday 12:00 pm
1) Jorden revised test plan and updated the combined functional specification
2) Willy and Clark went through the draftOct 17th
1)Jorden received some feedbacks from the TA
2)Submitted the report
1)
Meeting Minutes
Oct 20th

Sunday. 11:00am
1. Jorden: All the menus and sub menus are done. Set push button left to allow you to go back between menus to exactly where u were before
2. Jorden: Add the 2 sub-sub menus (one for setting time, one for setting light) and aslo add functions for engaging the servo and the motor and what should be displayed on the screen when those are called
3. 9V rechargable batteries could only support the curtain go up and down in three times and take way longer time to recharge using the solar array. Recommending purchasing another set of rechargeable batteries and high current output solar array

Meeting Minutes
Oct 22nd

Tuesday 12:30 pm
1. Budget reminder. $195 left for the project. Cost broke down
a. $40 for curtain in home depot
b. $215 for RP electronics
c. ~$25 for light sensor and digital clock purchase from Ebay
d. ~$25 for wood purchasing from arts and craft shop
2. Chaman has a 8v rechargeable battery with really high current output (10A +) and might brought it this weekend
1. Connect the servo and bi-directional motor to the curtain

Group07 Meeting Minutes 4. Oct 22nd – Nov 3rd. 2013

Meeting Minutes
Oct 22nd

Tuesday 12:30 pm
1. Budget reminder. $195 left for the project. Cost broke down
a. $40 for curtain in home depot
b. $215 for RP electronics

c. ~$25 for light sensor and digital clock purchase from Ebay
d. ~$25 for wood purchasing from arts and craft shop
2. Chaman has a 8v rechargeable battery with really high current output (10A +) and might brought it this weekend
3. Connect the servo and bi-directional motor to the curtain

Meeting Minutes
Oct 25th

Friday 12:30
1. Prepared progress report ppt draft.
2. Progress report presentation is next Friday
3. Will meet tomorrow for project meet up.

Meeting Minutes
Oct 26th

Saturday 13:00
1. Frame is partially done.

2. Got Grove RTC come in, took a look at the datasheet and related source codes. Need to decide what pins they are connected to on the Arduino boards RX/TX or SLC/SDA pins.
3. Same goes for the light sensor kit, need to determine on the pin connections.
4. The DC motor could pull up the the curtains smoothly except that the hot glue doesn't hold the motor very tight and one side is tilting up as the curtains are being pulled and the spools are rotating.
5. The 9v non-rechargeable might be the substitute for the 6v rechargeable battery for now until we have found out the cause and solution for extremely short lifetime of the 6v rechargeable battery when in use.
6. Need to test on whether it's the charging problem from the solar array or it's the rechargeable battery issue.
1) Charge 6v battery using regular battery charger and test the performance.
7. Tasks assigned for the next week for the Design Specification
a. Intro, letter, exec summary, test plan, conclusion : Jordenb. Overall system design, end formatting, extra drawings as requested: Willy
c.Electronic hardware, user interface: Clark
d.System Spec, Blind lift mechanism, Blind tilt mechanism: Chaman
e. references, editing, proofreading: everyone
8. Need to finish by the end of this week to leave room for modification

Meeting Minutes
Oct 29th 2013
Lab 1 12:30
1. Prepare for the progress presentation.

2. Edited the presentation even though we might not need to use it. We can still use it as a guideline for talk when doing presentation
3. Performed a detailed cost break down for the expenditures.
4.
5. Broke down the current task lists.
5. Discussed about remediation in terms of battery and DC motor pin broke-off.Oct 31st 2013.
Halloween
Online.
16:00
1. For project progress presentation, we need to pay attention to our schedules.
2. We need to bring our notes, prototypes, parts.
3. Our schedule is our weak point, so need to gather again for discussion tomorrow.
4. Need to revise the presentation

Meeting Minutes
Nov 1st 2013
Lab 1. 12:30 pm
1. Confirmed the sequence for presentation.
a. Chaman for the intro.
b. Willy for the finance
c. Jorden for the task break-down
d. Clark for remediation and summary
2. Things don't always go as planned.
3. Tas are very forward in terms of questions.
4. No meeting this weekend.
5. Work on the Design specification

Meeting Minutes
Nov 3rd 2013
Lab 1. 13:00 pm
1. Design specification documentation progress check
2. More details needed for electronic and interface section (Clark).
1. Will meet again on Wednesday for final editing.

Meeting Minutes
Nov 5th

Chaman:
tried the pins 20 and 21 on the mega

i already tried that on Thursday

didn't get any result. pins 4 and 5 actually give a number but its not right cause the value doesn't change according to the amount light

soooooooo i dunno what to try anymore

Meeting Minutes

Nov 10th

1. DesignSpecification

Meeing Minutes

Nov 21st

1. Testing

Meeing Minutes

Nov 28th

1. printed 3d

Meeing Minutes