

July 26, 2020

Professor Craig Scratchley
School of Engineering Science
Simon Fraser University
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RE: ENSC 405W/ 440 Project Proposal

Dear Professor Scratchley,

As part of Sleep Glory Technologies Inc., I am writing to present the proposal document. Medeor is designed to track each individual's brain activity, heart pulse, snoring, and movements. The data collected is used to improve their lifestyle by providing the user with live feedback. We intend to build a fully functional and cost-effective smart headband, and Android application, that is targeted as a health tracker, towards the general public.

The document will outline the market, competitors, company, costs and funding, and the project planning phases. We will bring our vision to life through the cooperation of engineers from various fields while keeping the finances within reasonable levels. Sleep Glory comprises five talented and hardworking senior engineering students in the concentration of Electronics Engineering, Systems Engineering, and Computer Engineering: Andriy Romaniv, Gurjinder Singh, Yury Zykov, Negar Bagheri Hariri, and Prithivi Kogulanathan.

On behalf of the team, we would like to thank you for taking the time to review our proposal document. You can contact us at aromaniv@sfu.ca for further inquiries.

Yours sincerely,

A handwritten signature in black ink, appearing to read "Andriy Romaniv".

Andriy Romaniv
CEO
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Project Proposal: Medeor

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Executive Summary

Sleep enhancement technology has been on the rise as a result of sleep-impaired habits. With an increase in unhealthy and stress induced lifestyles there has been an increase in demand for sleep associated technology [1]. Our project, Medeor, is aimed to help users improve their lifestyles by tracking their sleep, heart and snoring in an affordable and reliable way. Medeor comes with a comfortable headband that contains sensors to track the sleep, and an accompanying application that will display important information, suggestions, recommended actions and safety measures, such as calling a caretaker when irregular data is recorded.

The product consists of 2 parts: headband and application. The headband includes the following sensors: pulse sensor, microphone, accelerometer and EEG monitoring system. The pulse sensor and electrodes (for EEG), will be in direct contact with skin to provide a more reliable and accurate measurement of the health parameters. The microphone will be in close proximity to the mouth and as a result, the snoring can be recorded easily. Whereas an accelerometer will be located in the band and detect the sleeping position. With the combination of these readings, the end user will be able to understand their sleep cycles more easily, and/ or a health official can be provided with more data for a patient's diagnosis. The mobile application will be designed for users to view, analyze & understand the data with no prior medical knowledge. Furthermore, it will suggest a sleeping schedule and outline any sleep problems.

A study done on sleep disorders has revealed an increase in sleep apnea and insomnia amongst individuals [2]. This has caused a demand in the market for technology that will help improve one's sleep and lifestyle. However, with the current pandemic, the market may face a setback. But the economy is expected to recover once the pandemic is over. To add onto that, this would provide startup companies, such as Medeor, to enter the market and provide innovative solutions at an affordable rate.

The project had multiple stages to aid in building a fully functional prototype and as a result, the anticipated deadline for the Proof Of Concept is set to August 19, 2020. Project development is divided into separate tasks and milestones, which are followed by the team.

In addition, the cost of the proof of concept prototype is calculated to be \$202. The team is predicting lower cost for the production version of the product, as components could be purchased wholesale. The team is applying for Engineering Science Student Endowment Fund as well as Wighton Engineering Development Fund to cover some of the costs.

With a cost-effective, affordable and reliable sleep tracking headband, users will be able to monitor and improve their lifestyle without the need for expensive devices and at the comfort of their own home.

1. Introduction

Medeor is a cost-effective tool that can be used as a daily health monitor by tracking an individual's sleep cycle via electroencephalogram (EEG), pulse, snoring and breathing. The system will be able to collect the user's sleep patterns, analyze them, and recommend the solution. The input data is compared against pre-set values to determine the sleeping behavior of the user. If an irregularity has been detected, the user or any caretaker will receive a notification to inform them of any possible abnormalities.

Medeor is targeted towards people suffering from insomnia due to anxiety, stress, etc. However, with the additional built-in features such as the pulse sensor and snoring detector, Medeor is made for the general public interested in maintaining their health through a cost-effective and robust system.

2. Background

The market for sleep-associated technology is expected to cross \$27 Billion[2]. Studies show that about 33% of the world population suffer from insomnia and 10% of them are in chronic stage [3]. Furthermore, 40% of male and 24% female-identified individuals are habitual snorers, respectively [4]. This allows the sleep tech industry to grow at a rapid pace. Unfortunately, this analysis was performed before the COVID-19 crisis, thus the numbers would be affected. However, the problems will persist after the pandemic is over and Medeor will be there to help the people as a lightweight cost effective solution. There are not enough sleep centres to collect EEG and to diagnose every individual in a clinic as the scale of the problem is very large. Medeor will help the doctors as users can collect data at home. The app accompanied with Medeor will be able to provide suggestions to improve when the problem is detected in data and doctors can use the data to provide a precise treatment if the problem is critical.

3. Scope

The document provides information to the reader regarding the product overview; risks associated with the product and benefits the society can get from the usage of it; market & competitors on it; company organization; the timeline overview; and cost considerations. By reading through the paper the reader will be able to understand the product expected design, functionality, and the workflows.

4. Product Overview

Medeor has been designed as a cost-effective, robust and user friendly health monitoring system to help each user in tracking their health parameters and to improve sleep quality. This product will consist of two main parts: headband and mobile application. The Headband will be worn by the user overnight, and it will collect various sleeping data including brain activity, heart pulse and position of the head. The EEG will be responsible for monitoring electrical activity of the brain. The EEG data will indicate at what stage of the sleep cycle the user is in and detect any abnormal behaviour. Based on that information, Medeor will be able to play calming noises (white noise) to keep users in deep sleep. In addition, new sleeping schedules will be suggested.

The Figure 1 below describes how the entire system is expected to work and the expected design, respectively. The data from sensors is collected by a microcontroller and sent via Bluetooth. Mobile application receive the data, analyze it & display the result to a user. Also, based on the data collected mobile application will be suggesting the sleeping schedule, play white noises.

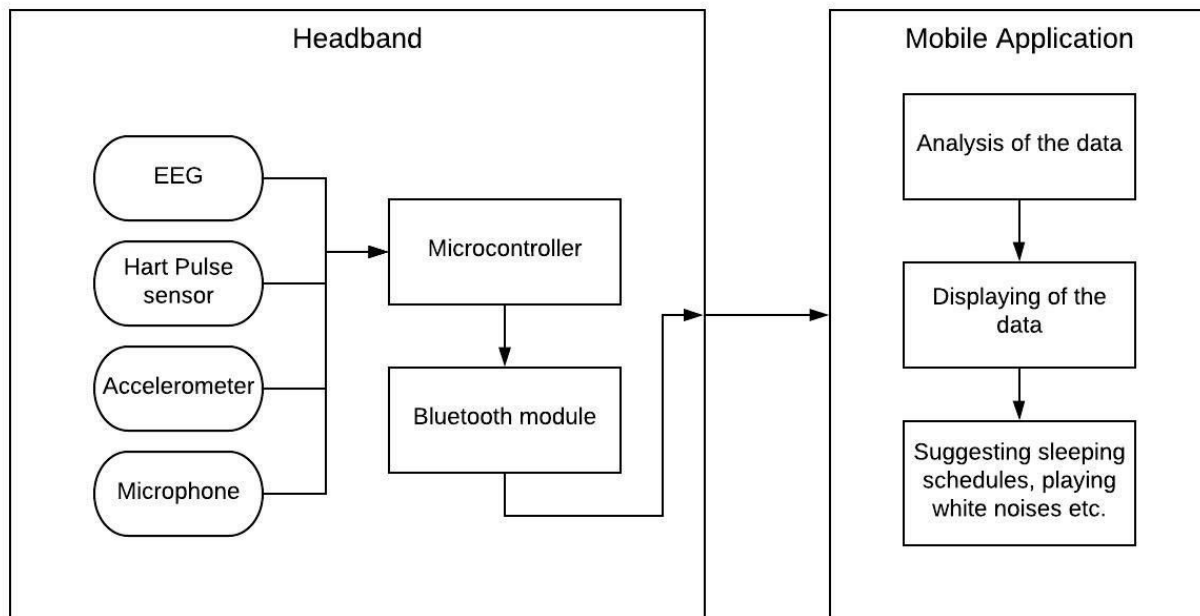


Figure 1: Medeor System Block Diagram

Figure 2 shows the sample design of the headband. It will include an embedded EEG monitoring system, pulse sensor, accelerometer, microphone, Bluetooth module and power supply. The EEG used in conjunction with the pulse sensor would provide a more reliable

analysis of the user's sleep. The embedded microphone will help to detect the user's snoring pattern and can be used to reveal the causes of spikes in brain activity.



Figure 2: Model of Medeor

The data collected from the sensors will be amplified & filtered. It is then transferred to a microcontroller and stored in a SD card for sending to the phone. The microcontroller will connect to a mobile device via Bluetooth , after which the data is transferred. The transferred data will be analyzed and the results will be displayed. The analyzed data will be stored, so it could be compared against other historical data to detect problems and to make suggestions to the user.

5. Risks And Benefits

5.1 Risks

The Medeor is an electronic device with a built-in power supply (3.3V battery), thus there are a few risks associated with it. We outline the following hazards [5]:

1. Thermal runaway due to excessive temperature (as low as 148 °C)
2. The contact of water with lithium can cause a fire, due to generation of highly flammable hydrogen gas
3. Formation of dendrites and eventual internal short-circuit of the cell
4. Oxidation
5. Excessive force or deformation can cause a runaway & fire

To reduce the risks the company defined the hazard specifications in the Design Specification document and outlined international standards for electrical products in Requirement Specification document. Also, the product will include the safety policies, so the customer will be aware of any possible hazards. The policy will explicitly define the extreme temperatures & excessive force. Also, policy will include warnings that the product should not be used by kids, unless it's required for treatment.

Another risk is associated with Bluetooth usage: some people believe that there is an effect of EMF radiation on human brain activity. Such claims are arguable, according to [6], which shows no effect of EMF on human brain activity. However, the team understands the concern of an end user and will develop functionality for a Bluetooth control. So, wireless connectivity can be switched off when sleeping (upon user request). Data would be transferred when the application is reopened after the night session (if this feature is enabled).

Another concern would be the cleaning procedure for the headband. Medeor is a wearable product, so it has to be cleaned. As it is stated above the water might cause a fire and product breakdown. Therefore, the company has to account for some kind of cleaning utility, which will wipe out sweat, skin particles and dust.

In order to be competitive the headband has to be soft and comfortable. The user should feel comfortable when sleeping, so the headband doesn't interrupt the sleeping. The risk to be uncompetitive due to poor design is crucial, since it may break the purpose of the product (to increase the sleep quality).

On the software side the risk would be the possible data leakage. The application will store personal data & sleeping schedules. To prevent any unwanted access on the device the application will have a log-in system. As well, later in production the data has to be stored on the cloud, so the user can access it from multiple devices. To prevent any issues with data

leakage from the cloud we are considering using Amazon Web Services (AWS) or Google Cloud Platform (GCP) to store the data for security. These 2 solutions have a built in safety policies and are allowing for additional safety features. The “Sleep Glory” is a company that produces devices to improve sleeping quality, not cloud protection. Therefore, outsourcing such a job to Google or Amazon would be the best solution.

5.2 Benefits

The first benefit of our device over the competitors would be the wider functionality. The product records EEG, analyzes it and provides suggestions. Moreover, Medeor tracks breathing, sleeping position and pulse whereas the other competitors do not. The more descriptive analysis is provided below in section “Competition” of the document.

The second benefit would be low cost. The Proof of Concept (POC) development is easily affordable and doesn’t require an excessive cost or fundings. Also, the production cost would decrease significantly since the PCBs for the circuitry can be ordered in wholesale with all of the components. Whereas for POC, the company is forced to purchase Plug & Play modules for Arduino. The “Cost Consideration” section is also described later in a document.

In addition, the growing market of sleeping devices shows the necessity of the product. Medeor contributes towards better sleeping quality and can be a solution for people suffering from insomnia. It can be used by a specialist to analyze the sleeping quality and write prescriptions based on the data collected. This will remove the need for overnight in-house control of the patient and reduce associated costs. As well, people who are concerned about their sleep would benefit from Medeor by arranging their sleeping schedule according to the suggestions; analyzing the heart pulse data; monitoring the snoring data & sleeping position.

Finally, the company is considered about the fauna, therefore the Medeor is designed under cradle-to-cradle considerations. All parts of the products can be reused or recycled to reduce the depletion of resources.

6. Market

Over the past few years, sleep-enhancing devices have witnessed tremendous advancements that have revolutionized the sleep tech industry[7]. Big companies like Samsung, Apple, Fitbit and Phillips have launched products to capture the growing market for themselves. Rising availability of sleep devices because of these tech giants will positively influence the sleep tech devices' market growth[7]. The direct sale of sleep tech devices to customers, bypassing the hospitals, was valued around USD 4 billion in 2018[7]. Devices like premium mattresses, high tech pillows, CPAP devices, white noise machines, smartphone apps, and more have become a \$28.6 billion a year industry[8].

Presently, the changing lifestyle, consumption of junk food, lack of exercise, increasing stress, and nocturnal environmental noises in the metropolitan cities, have disturbed the normal metabolism of an individual's body [1]. This ultimately increases the prevalence of sleeping disorders such as obstructive sleep apnea, narcolepsy, insomnia, etc [1]. These factors have resulted in an increase in demand for sleep tech devices in developed countries[9].

The US population will be the biggest target for Medeor, because the American Sleep Apnea Association, estimated that 22 million people in the U.S. suffer from sleep apnea, and 80% of the cases of moderate and severe obstructive sleep apnea are undiagnosed[9]. Out of 325 million Americans, 58% are estimated to experience insomnia symptoms or sleep disorders[8]. Another study by Stanford Medicine states that more than 100 different types of sleep disorders, that range from difficulty sleeping at night to excessive daytime sleepiness[9]. Moreover, As per the Anxiety and Depression Association of America and the National Institutes of Health, more than 40 million people in the U.S. suffer from chronic, long-term sleep disorders[9]. To address the issue, there are now an estimated 4,700 "sleep labs or centers" in the United States, to perform sleep studies and to design treatment programs[8]. Medeor can take the data collected by sleep labs and convey the designed treatments for the disorder detected by it. Therefore, the US is one of the biggest markets where people not only need the product but can also afford it.

However, the US is not the only market as sleep problems are not just limited to US citizens. There is an alarming rise in the incidence of insomnia, sleep apnea, and other sleep disorder cases, in Western countries, including the U.K., Germany, France, and Russia[9]. To address this rise, sleep devices can be used as sleep study tools to easily measure the biological parameters responsible for sleep disorders [9]. This allows the doctor to decentralize the healthcare-related to sleep, where people collect their own data at home and doctors examine the data to treat the problems. This method can be demanded in a pandemic like COVID-19. Medeor can play a key role in bringing treatment to homes while keeping everyone involved safe.

A major concern of the market right now is the affordability of Medeor as markets around the world are struggling. However, this is not a fixed state of the world and markets will bounce

back. This is an opportunity for Medeor to develop in the meantime and establish links in hospitals that will take this product on for treating the patients. Insurance companies could be asked to pay for Medeor as part of its policy to cover brain scan cost[10]. Finally, Medeor can also be rented to the patient by the hospital to record all the data at home for treatment.

7. Competition

The Medeor will not be the only device on the market that is measuring EEG of people and showing them the data. However, it will be the first of its kind which will detect sleep disorders such as insomnia in the people.

Before the other products, clinical EEG is also a competitor, but it has its own problems which make it less of a competition to devices like Medeor. The problem with the current clinical EEG is the deployment time that can take up to 40 mins [11]. To prepare for clinical EEG, a procedure must be followed which requires marking the positions for electrodes all over the head as per the 10-20 EEG system, removing the top layer of skin by abrading, application of electrolyte and gluing electrodes to the scalp[12]. Additionally, most EEG acquisition systems are large and heavy which prevents EEG from reaching homes of patients, in the battlefield and for transportation of patients[12]. The Medeor cut down this procedure to just wearing the portable lightweight headset and recording the data. This saves time and gives power in the hands of people who need it.

Other than clinical EEG, there are several competitors on the market such as Muse S, Dreem, Philips SmartSleep, SleepPhones, Fitbit and Apple Watch. The first device is Muse S, which focuses on helping people with meditation. It tracks EEG, heart rate, breathing and body movements to help people to build a consistent meditation practice[13]. However, this device neither focuses on the sleep EEG nor does data analysis for any sleep problems, even though it tracks the EEG in general.

Dreem is another product that is designed to help the health professionals to study brain disorder so that it can be treated. It provides an easier way of collecting EEG data at home than the clinical EEG. However, all the headsets like Dreem, use the dry electrodes, while Medeor will use the Ag-AgCl electrodes, which are better at conducting the impulses from the forehead[14].

Additionally, a person can buy these headsets for home use, but the functionality is limited to the representation of data and telling if the user slept well or not during the night [15]. The user is free to compare the data with previous nights, but our app will do that and try to detect the problem of insomnia. Products like Dreem are also an expensive device for an individual to just look at the sleep cycle. Similarly, SmartSleep is also a product that measures EEG. The device tries to help the user in improving their sleeping quality. It's a drug-free sleep enhancement technology. However, It is not detecting any problems in sleep [16].

Products like sleepPhones just play uncontrolled sounds, it's like a smaller version of SmartSleep, without any EEG and data analysis [17]. Common products like Fitbit and Apple Watch track your sleep based on the body movement and heart rate. Heart rate variability (HRV) data is combined with body movements data to determine sleep stages. These devices just show the data but do not detect any sleep disorder [18].

Therefore there is no device on the market that is directly working towards detecting and solving the sleep disorders such as insomnia. Medeor has an opportunity to capture this market by providing active solutions to its users while other devices are just collecting data and displaying it.

8. Company

Sleep Glory Technologies Inc. is a start up company founded in 2020 that focuses on enhancing customers' sleep habits. The company was co-founded by 5 versatile engineers studying at Simon Fraser University with a passion for creating new technologies for the general public to help improve their lifestyle at an affordable rate. Figure 3 displays the logo of the company.



Figure 3: Company Logo

The first prototype of Medeor was created to target people with sleep disorders. Our product is aimed to act as a health monitor, where users are notified if the sensors and EEG monitoring system pick up an irregular activity in the sleep cycle, snoring and heart rate. Furthermore, our product is coupled with an application that is aimed to provide the end user information regarding their sleep and health, as well as providing some recommendations. The completion date of the prototype is expected to be around December 2020.

8.1 The Team

The team responsible for the first working prototype come from different engineering backgrounds and have utilized their expertise by specializing on different parts of the project. Each team members skills and contribution are listed below.

Andriy Romaniv- CEO



Figure 4: Photo of Andriy Romaniv

Andriy Romaniv is a 4th year Systems Engineering student with a multitude of experience working as a software developer at Nokia and Here Technologies Inc., and as a Project Manager at SAP. Based on his prior experience with project management, he is helping the team with GitLab maintenance and planning. To add onto that, he co-founded and developed a music service site. Andriy aims to deliver impactful projects to the society. Hopefully, the team will incorporate his technical skills in creating the Medeor project.

Gurjinder Singh- CTO



Figure 5: Photo of Gurjinder Singh

Gurjinder Singh is a 4th year Electronics Engineering student with a wide range of skills in designing, implementing and testing electrical designs. Gurjinder gained and polished his skills by working for INEO Solutions Inc., Algo Communication Products Ltd. and Better Way Lighting. He is very passionate about medical devices as they bring a positive change in the health of society. Also, he is familiar with the procedures and requirements for bringing a medical device

to market. For Medeor, Gurjinder is interested in the hardware design and implementation of the EEG monitoring system to create an effective and reliable prototype.

Yury Zykov- COO



Figure 6: Photo of Yury Zykov

Yury Zykov is a 4th year Systems Engineering student with a passion for developing engineering related components, both software and hardware. Furthermore, he has previously worked at Change Healthcare as a Radiology Software Engineer, thus Yury has some background in medical R&D. With a combinational skill set for both hardware and software, he aims to utilize the knowledge and expertise in creating the headband and data communication between the sensors and microcontroller of Medeor.

Negar Bagheri Hariri- CFO



Figure 7: Photo of Negar Bagheri Hariri

Negar Bagheri Hariri is in her 4th year of Computer Engineering and will use her expertise in creating and maintaining the systems software, both back-end and front-end. She has previously worked at Sierra Wireless and Maxim Integrated. Negar hopes to incorporate her knowledge and skills in debugging and running the software component of the prototype.

Prithivi Kogulanathan- CIO



Figure 8: Photo of Prithivi Kogulanathan

Prithivi Kogulanathan is currently in her 4th year of undergraduate studies, pursuing Systems Engineering. She has previously worked as a hardware and software engineer at Douglas Lighting Inc. and Appnovation Technologies, respectively. Therefore, Prithivi has experience working with Bluetooth technology and open source software. As a result, she aims to use previous experiences in building a user-friendly prototype that would be easily used by every individual ranging in ages.

9. Project Planning

Capstone project spans for two semesters (four month each). First part (May - Aug 2020) includes proof of concept prototyping (POC). During this phase, the team has to elaborate on the main components of the product, determine requirement specifications and finalize the design specifications. After finishing all of the required research, the team has to assemble a POC prototype for both hardware and software parts. In addition, the appearance prototype has to be developed. The second 4-month phase (Sep - Dec 2020) will be dedicated to the creation of the working prototype of the Medeor product. For this development stage, all of the hardware has to be fitted inside the headband. For this document we are only concerned about the phase 1 of the development.

Figure 9 displays the main deadlines of phase 1. ENSC 405W requires submission of three documents throughout the semester and a video presentation at the end. The team took into consideration these deadlines and created GitLab milestones and tasks for them. It is important to combine technical progress with the documentation requirements.

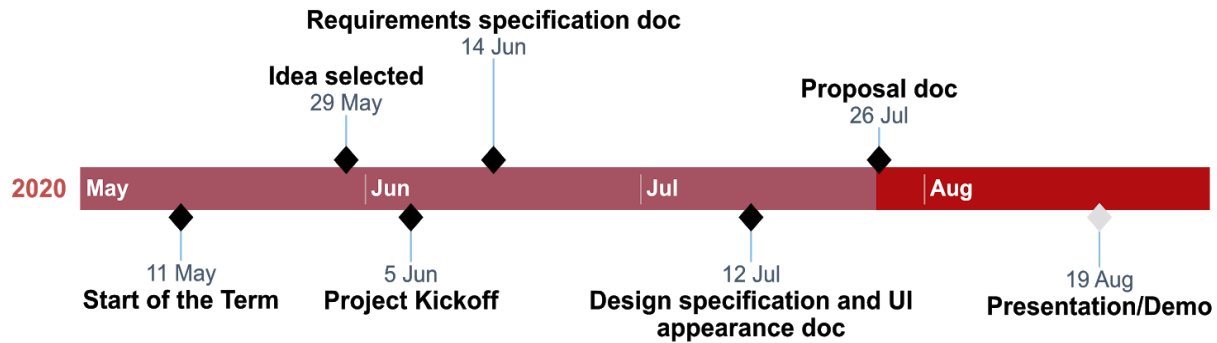


Figure 9: Phase 1 documentation deadlines

After the beginning of the development of the project, the team has created technical tasks and milestones that had to be completed. In order to finish the POC prototype before the deadline, tasks in Figure 10 have been created. The team decided to allocate time for all of the product components and stages. The below gantt chart includes technical stages that are required for the project completion including time for parts ordering and time for POC assembly and testing.

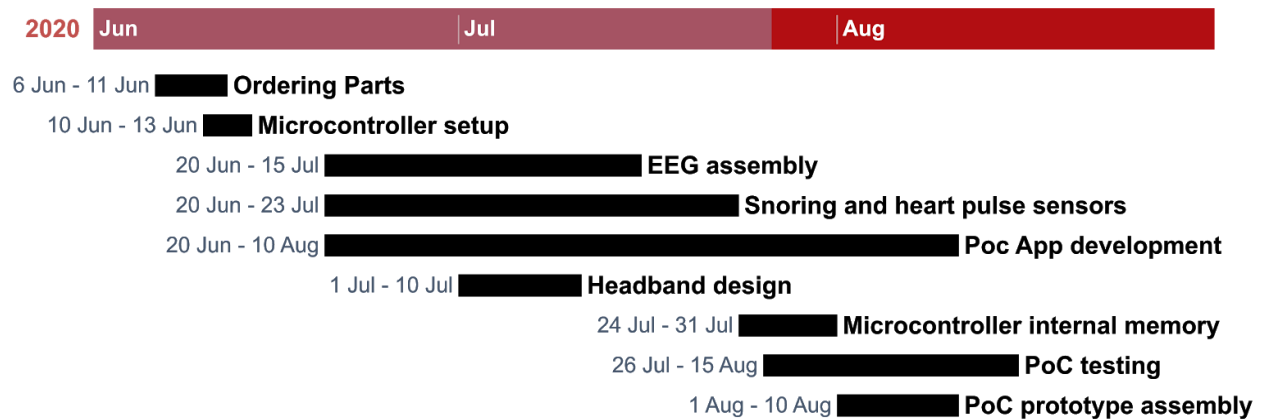


Figure 10: Technical project task

The above tasks are internal. The team allocated a few days for ordering parts from online resources and local electronics stores. After that, a microcontroller setup was planned, including

establishing Bluetooth connection with the phone. On Jul 20th hardware assembly and mobile application development stages started. Shortly after that, the team planned to start working on headband design and requirements. In addition, POC assembly and testing stages have been planned for as well. The team used the above tasks to create milestones in the GitLab environment. Strict deadlines of the above processes allowed for a better planning of the inperson team meetings. Another benefit of such planning is a concurrency of multiple tasks and topics, which lead to the efficient usage of the team's resources and time.

Development of the Medeor project requires a lot of technical work to be completed. However, in order to deliver a product, the team has to complete a few other tasks, including market research and technical documentation. The Gantt chart below (Figure 11) generalises Figure 10 and adds such important tasks as writing up documentation and development of the company's symbolics (name and logo). Thus, Figure 11 displays major processes required to complete phase 1 of the capstone. In addition, the chart allows the team to allocate time for elaboration and paper writings.

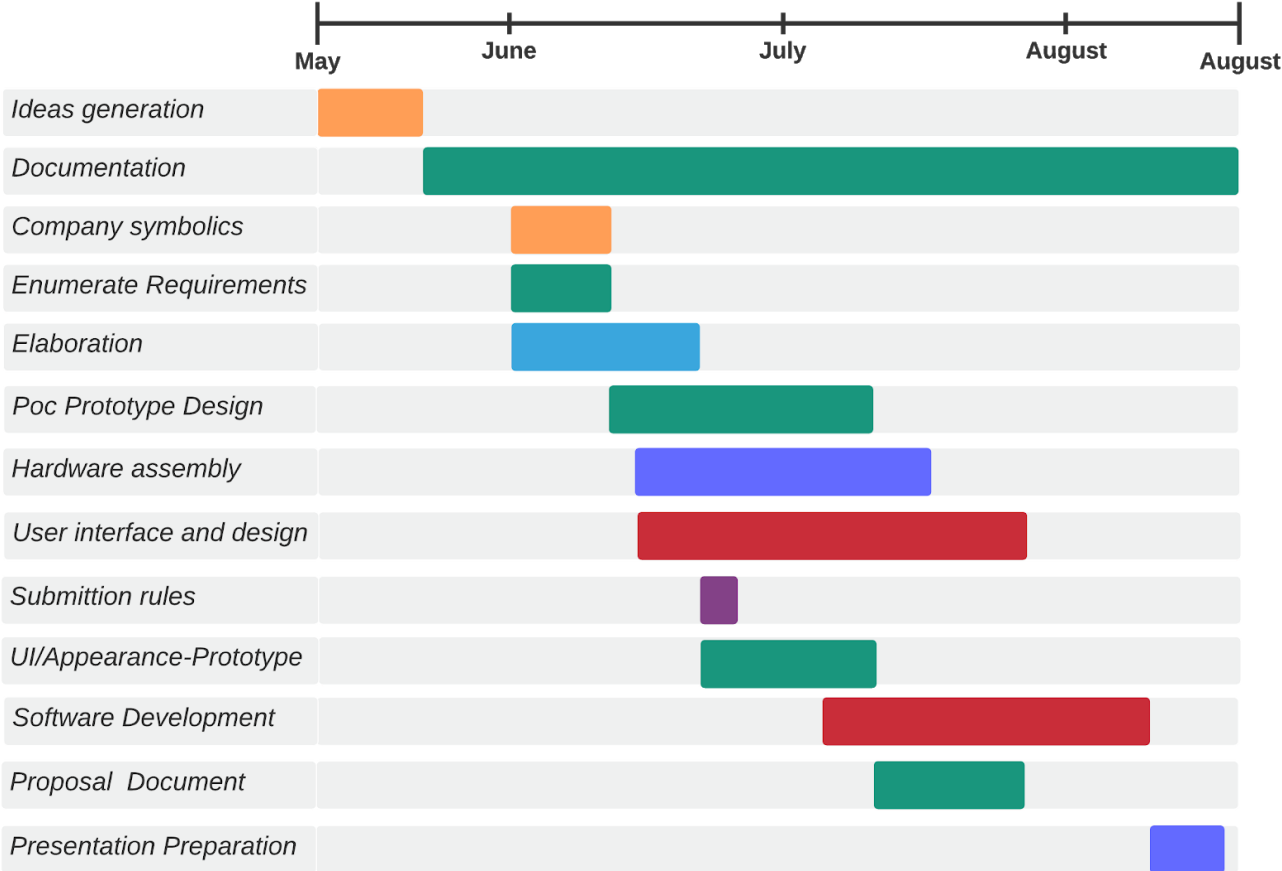


Figure 11: Tasks to be completed for the POC stage

After determining major milestones and tasks for the phase 1 of the capstone project, the team has decided to hold weekly planning meetings. During such meetings, a set of weekly tasks is

determined. This set is called a sprint. Compilation of all the tasks in the sprint is critical for the team's ability to meet the deadlines. In order to eliminate any potential schedule slippage, the team holds 10 minute daily sync-up calls to discuss ongoing issues.

10. Cost Considerations

10.1 The Estimation Of Project Costs

The Proof of Concept Costs (Table 1) below demonstrate the total cost of the headband on POC stage and broken down costs of each part.

Table 1: Proof of Concept Costs

Parts	Descriptions	Total Costs(CAD)
Bluetooth Module	BLE HM-10	\$15
Microcontroller Boards	Arduino pro mini 328 - 3.3v/8mhz	\$23
Circuit Components	Resistors, Capacitors, Wiring Potentiometers, Transistors	\$30
Snoring Detector Sensor	SPW2430 Microphone chip	\$7
Accelerometer	adxl335 accelerometer price	\$23
Power Source	Li-Ion battery	\$19
PCB & Micro SD	Protoboard or copper etching	\$20
Pulse Sensor	SEN-11574 model	\$15
Headband	3D Printed model	\$50
Total		\$202

The prototype cost will not be much different from the POC cost, since all of the parts will be used in both of the stages. There might be a need to purchase several components, but this price would be small. The only difference will be the Headband appearance, since it would be covered with a soft material and textile.

The production costs will be reduced since the PCB and all electrical components would be purchased on wholesale, thus the cost of each component will be reduced. Also, the table 1 above, represents the prices for plug & play components for the Arduino board, which were purchased from the store. The manufacturing will remove these excessive costs and Sleep Glory will consider developing a microcontroller for this specific purpose in the production stage. The production stage will also lead to some R&D costs for both hardware & software.

10.2 Potential Funding sources

10.2.1 Engineering Science Student Endowment Fund (ESSEF)

The engineering science undergraduate student project awards will be given annually for projects proposed by SFU Engineering Science undergraduate students. This fund will be granted by the Senate Undergraduate Awards Adjudication Committee on the nominations of the Funding Council and the Director of the Engineering science [19]. ESSEF has four different categories: A, B, C, and D. The capstone projects will be included in category C. However, since we had included our business plan in our project proposal we are also qualified for Category B. We do not expect to encounter any difficulties in obtaining funding from the ESSEF as we meet the criteria in these two categories.

10.2.2 Wighton Engineering Development Fund

The Wighton Development Fund that is administered by Dr. Andrew H. Rawicz, will fund the student projects that satisfies Wughton's requirements. A proposal will have to be submitted and it will be evaluated by the fund's committee. We are hopeful to receive this fund since our project is for the benefit of the society which parallels their criteria. They have mentioned that projects with the purpose of aiding for the elderly and the physically or mentally disadvantaged individuals, will be treated preferentially [20].

10.2.3 Personal Funding

The team has agreed on contributing to the cost of the product. If the funding sources listed above won't cover the full cost, the company will handle an excessive cost by dividing over contributors. The company expects to not have any excessive costs, but Sleep Glory will account for \$500.

11. Conclusion

Medeor is aimed to be a health tracker for individuals looking to improve their daily routine by monitoring their sleep cycle and other health parameters. Our product is a cost-effective, robust and user friendly system, designed to help those struggling with insomnia. The team is working to create a safe and comfortable headband, with a user-friendly mobile application. We have considered all the risks and benefits from the product. Also, the team analyzed the market and competitors, so the Medeor can be a compatible solution.

The paper discussed the company participants and field-related knowledge and experience of each contributor. It also described the detailed project timeline with the set deadlines.

By implementing up to date technology and efficient algorithms, Medeor aims to provide a reliable method to help monitor the user's health. The electrical components used in the final product have been carefully designed to provide all the necessary features in a space confined configuration. The cost of electrical components was considered to estimate the POC & production costs.

As part of Sleep Glory Technologies Inc. we strive to provide a reliable, safe and eco-friendly product to our consumers through innovative and efficient features at lower cost, as outlined in this document.



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