Written Progress for OXITRAK-5001

"Track the Rhythm, Keep it Beating"

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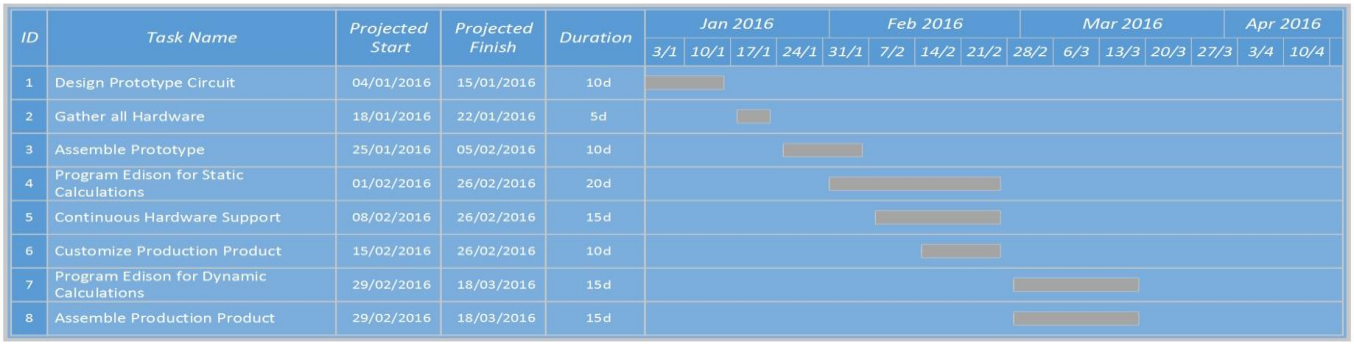
1. Introduction / Background

OxiTrak helps people with respiratory and heart conditions to keep track of their heart rate and oxygen saturation levels. It takes these readings with the help of an oximeter, which transmits the read signals to a microprocessor, from where the processed signal is then sent to a companion app. The app visualises the data into human readable form; in case of any alarming readings, the app queries the user about their well-being and in case the user doesn't responds promptly a health care professional is contacted. This ensures immediate help can be reached in a timely manner.

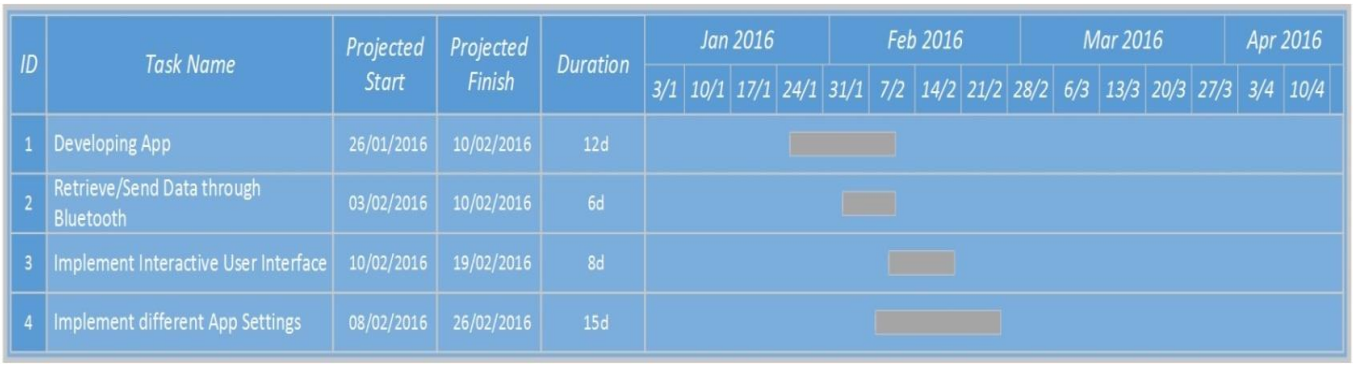
2. Schedule

The two charts in **figure 1** and **figure 2** below show the timeline as was created at the start of the project. This timeline was designed to compensate for any unexpected delays, i.e. the project would be completed by mid-March. We were unable to keep up with our aggressive schedule, but are still very much on track and will be ready in time for the final demo, come April 14th, 2016. Currently, Edison has been fully programmed for dynamic calculations and we are putting finishing touches to the assembly of the final product. The casing for the devices should be printed and assembled by the first week of April. For the software section, all main settings and functionalities of the app have been implemented and tested.



ID	Task Name	Projected Start	Projected Finish	Duration
1	Design Prototype Circuit	04/01/2016	15/01/2016	10d
2	Gather all Hardware	18/01/2016	22/01/2016	5d
3	Assemble Prototype	25/01/2016	05/02/2016	10d
4	Program Edison for Static Calculations	01/02/2016	26/02/2016	20d
5	Continuous Hardware Support	08/02/2016	26/02/2016	15d
6	Customize Production Product	15/02/2016	26/02/2016	10d
7	Program Edison for Dynamic Calculations	29/02/2016	18/03/2016	15d
8	Assemble Production Product	29/02/2016	18/03/2016	15d

Figure 1: Hardware Development Timeline for OxiTrak-5001



ID	Task Name	Projected Start	Projected Finish	Duration
1	Developing App	26/01/2016	10/02/2016	12d
2	Retrieve/Send Data through Bluetooth	03/02/2016	10/02/2016	6d
3	Implement Interactive User Interface	10/02/2016	19/02/2016	8d
4	Implement different App Settings	08/02/2016	26/02/2016	15d

Figure 2: Software Development Timeline for OxiTrak-5001

3. Financial

The table below shows the details of all expenditures made so far. With an **approved funding of $380** from the Engineering Student Society Endowment Fund (ESSEF), OxiTrak

is well within budget limits and has room to cover unforeseen expenses. In the case of an emergency, we will put in an application for the Wighton Fund.

Expenditures till Date	Estimated Unit Cost
Intel Edison and Mini Breakout Kit	$112.50
Intel Edison Battery Block	$37.50
Intel Edison Hardware Pack	$5
Texas Instruments OPT101 (IC)	$30
Different types of red and infrared LEDs	$25
MAX30100 Infrared Sensor	$35
Total Cost	$245

Table 1: Expenditure for OxiTrak-5001

4. Progress

a. Hardware

Research of design and stability of the oximeter have been conducted and constructed using Intel Edison and an earpiece sensor. IC's and PCB have been assembled into a prototype, currently refining design to meet typical use cases. Fabrication of earpiece-cover of the sensor has been constructed using AutoCad and sent to Gary Shum for 3-D printing

b. Firmware

Data transfer protocol specified in design specs have been implemented. Through python scripts to handle Bluetooth and sensor driver, the Edison will respond to queries from smartphone accordingly.

c. Software

App programming have been completed according to design and functional specifications documents. User registration, main page and additional features such as geolocation and SMS notification have been implemented and tested fully.

d. Documentation

Currently, we are in the process of completing the last document, post-mortem rubric, and preparing for the presentation by storming video ideas. A film maker has been hired and taping of the product will be conducted on the 31st of March.

5. Summary

We have completed the design of software, hardware and firmware components of OxiTrak. Testing of data retrieval has been constructed on several meetings and meets the design and functional requirements. At the moment, we are packaging the product and sending the ear-piece case for 3-D printing. Moreover, we are in the process of writing the last required documentation and preparing for the presentation by filming and editing a presentation of the product to the user.