Deliverable E - Project Schedule and Cost

Introduction

The objective of this document is to develop a project plan and a schedule to ensure our team can complete all three project prototypes on time and provide an estimation of the costs and the components that will be required. This document starts by highlighting a general timeline for the prototypes due, to see the in-depth timeline please refer to the Gantt chart attached. Next, the materials needed are broken down and costs are estimated for each material.

Then, the totals are displayed for each prototype. The goal with this cost estimation is to see what is feasible and what is not feasible to accomplish. As a group, we have conclude that our concept is feasible as long as we find the affordable materials over reading week. If we are unable to do that, then we will regroup and use a different/more affordable concept.

Next, we listed the significant resources and the risks in this project, then came up with contingency plans for every possible risk. We believe that we were realistic in coming up with these risks and contingency plans.

Tasks and Estimated Time

Prototype 1

- Determine budget and cost for 1st prototype (feb 16th)
- Obtain materials (feb 18th - 26th)
- Build 1st prototype (feb 26th - mar 5th)
    - Basic proof concept - basic shell made from cardboard/scrap material
- Meet with client to receive feedback/guidance (feb 27th)
- Complete client feedback report (mar 6th)

Prototype 2

- Determine budget and cost for 2nd prototype (mar 6th)
- Research arduino circuitry, LCD screens, heart rate sensors (mar 6th - mar 8th)
- Obtain materials and build 2nd prototype (mar 8th - 10th)
    - Focus will be mainly on circuitry/arduino
    - Analytical model included
- Test second prototype (mar 11th - mar 12th)
- Obtain feedback for the second prototype (mar 12th)
- Complete client feedback report (mar 12th)

Prototype 3

- Determine budget and cost for 3rd prototype (mar 13th)
- Obtain materials (mar 13th - mar 20th)
- Build third prototype (mar 21st - mar 24th)
- Test third prototype (mar 24th - mar 26th)
- Meet with client to receive feedback for third prototype (mar 26th)
- Complete client feedback report

Presentation

- Preparing Presentation (Mar 26th - 29th)
- Presentation (Either Mar 29th or 31st)

Estimated Costs

Prototype 1

- Cardboard (Free)
- plastic/ decorating paper ($5-10)
- Total Cost = $5 - $10

Prototype 2

- cardboard (Free)
- LED ($5-10)
- circuit wires ($2-5)
- LCD screen ($5-20)
- arduino board ($10-20)
- heartrate sensor($5-40)
- Resistors ($5)
- 6V Battery ($5-10)
- Total Cost = $37 - $110

Prototype 3

- Chest plate ($10)
- Circuit wires ($2-5)
- Total cost = $12 - $15

Total Cost overall: $54 - $135

Economics:

When creating a list of the cost of materials, we took into account that we will use cardboard as the base for creating the chestplate in prototypes 1 and 2. Our concern for prototype 3 is that finding an affordable chestplate may prove to be challenging. Right now our plan is took look for one at thrift stores and costume stores, and not go over $10 for it.

Additionally, what takes up most of our budget are the circuitry components, specifically the heart rate sensor. We found a heart rate sensor for only $5 online, however this sensor clips onto the user's finger. What this means for our design is that we would have to add arm pieces to our chestplate design in order to have the wiring go up to the LCD screen without looking silly.

However, this might be what we have to do in order to make our budget work. Our plan is to keep researching and looking around for the heart rate sensors that can stick directly to the chest that are under $20, and if we cannot find one after reading week, then we will get the finger heart rate sensor and revamp our design.

Overall, we will be able to make our budget work as long as we can find a cheap chestplate to use, and a cheap heart rate sensor. We believe that we can do this as long as we find the right materials over reading week.

Risks and Resources

Significant resources:

- Heart rate sensor - will have to order online
- LCD screen - will have to order online

Risks

- Materials do not arrive on time
    - LIKELIHOOD: low
    - SEVERITY: high
- Group cannot figure out the proper circuitry
    - LIKELIHOOD: medium
    - SEVERITY: medium
- Budget is too small - can't afford supplies
    - LIKELIHOOD: high
    - SEVERITY: high

Contingency Plan:

- Materials do not arrive on time
    - We will order early (over reading week) and if the materials arrive later, we will go to an electronics store or the makerspace store and purchase the materials needed ourselves
- Group cannot figure out circuitry
    - We will start early researching how to configure the circuit properly and we will ask Justine in the makerspace for help with the circuit
    - If the circuit turns out to be too complex for our skill level we will switch to a simpler design where the user presses a button to light up their suit (we know we can figure that out since it will be similar to the arduino lab we did)
- Budget is too small
    - We will revamp our design if the budget is too small to cover our current design. We plan to look at thrift stores and and junkyards for supplies over reading week and if we successfully find supplies then we will be fine. Else, after reading week we will reconvene and change our design to fit the budget.

Conclusion

With a clear budget and timeline established, we are now able to move forward in collecting materials and building the first prototype. We acknowledge that there are gaps in our skills, abilities and knowledge when it comes to circuitry and using the arduino, which is why we put tasks in the timeline to learn how these things work in more detail. We feel that we have covered all of our bases and prepared contingency plans for every possible risk. Overall, we are feeling confident about what we have so far and where we are going with this design.