Department of Computer Science and Engineering
The University of Texas at Arlington

eCardiac

Personal ECG Monitor

Team Members:
Jose Miranda
Marc Streeter
Michael Flanagan
Minh Tran
Nicholas Skrobe

Late Updated: 15 August 2012 @ 3:27:00 PM
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1 General Organization

1.1 Project Manager

Marc Streeter will perform the role of team leader. Marc has the ability to delegate roles and divvy up work among the talent that resides within the team. His ability to recognize the strengths of each of the team members and coordinate those strengths will aid in the ultimate success of this project.

Marc will be accountable for ensuring that the group maintains focus throughout the project by aiding team members in clearly identifying for all stakeholders their particular and sometimes dependent roles throughout the project. In relation to focus, he will also work to enable successful team meetings by establishing a set agenda and seeing to its completion. Finally, Marc will be responsible for maintaining a communication schedule with the sponsor.

1.2 Project Oversight

Team eCardiac will perform internal oversight by meeting weekly to establish needs, set up team roles, identify risks, deliver personal project status, and providing team feedback. All deliverables will be maintained via DropBox.com cloud data storage service, and each member will be given access to make changes to documents therein.

Professor Michael O’Dell oversees our project externally and provides general counsel as needed. He will require timely team status reports to serve as a gauge for our project progress and as an aid in identifying activity that he may see as erroneous or detrimental to the success of the project. Additional oversight will be provided by our ECG sponsor, Marcus Hanmer. Marcus’ primary region of interest is aiding in eCardiac team members’ proper understanding and creation of an ECG device.

1.3 Roles and Responsibilities

<table>
<thead>
<tr>
<th>Role</th>
<th>Team Members</th>
<th>Responsibilities</th>
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</thead>
<tbody>
<tr>
<td>Supervisor</td>
<td>Mike O’Dell</td>
<td>Grading Deliverables</td>
</tr>
<tr>
<td>ECG Sponsor</td>
<td>Marcus Hanmer</td>
<td>Provides guidance and customer requirements relevant to ECG component of product</td>
</tr>
<tr>
<td>Team Leader Schedule Overseer</td>
<td>Marc Streeter</td>
<td>Helping guide the group as a whole, overseeing the schedule and plan</td>
</tr>
<tr>
<td>Role</td>
<td>Person</td>
<td>Responsibility</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>----------------</td>
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</tr>
<tr>
<td>Earned Value Tracker</td>
<td></td>
<td>File, tracking value from said file, and aiding in software development</td>
</tr>
<tr>
<td>Software Assistant</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hardware Lead</td>
<td>Nicholas Skrobe</td>
<td>Aiding hardware development and compiling and editing for quality deliverables</td>
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<td>Document Compiler</td>
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<tr>
<td>Software Lead</td>
<td>Jose Miranda</td>
<td>Heads software development and resource procurement</td>
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<td>Procurement Manager</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MS Project Assistant</td>
<td>Minh Tran</td>
<td>Aids in creation and updating of project file, assists in software development</td>
</tr>
<tr>
<td>Software Assistant</td>
<td></td>
<td>and plans for occurrence of risks</td>
</tr>
<tr>
<td>Risk Manager</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MS Project Lead</td>
<td>Michael Flanagan</td>
<td>Heads creation and update of project file, and aides in hardware development</td>
</tr>
<tr>
<td>Hardware Lead</td>
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</table>
2 Scope Statement

Team eCardiac will design a garment with a built in ECG device. This device will transmit a signal that will be processed by separate but connected processing unit. The unit will analyze the signal and determine whether or not the user is experiencing a heart attack. If a heart attack has been detected our device will contact 911. eCardiac will meet these minimum requirements and will strive for but not limit themselves to complete user comfort and product unobtrusiveness.

Figure 1-1: Product Concept
3 Cost Management Plan

Any sort of cost Management Plan can be considered an important part of any project, especially in the case of Senior Design were we are expected to produce a product in relatively limited amount of time and within a relatively small budget. If proper planning and calculations are not made for the budget then there are significant risks in surpassing our budget costs.

3.1 Labor Costs

Overall for the 2000 man hours expected of us during this project we expect an average of 15-20 hours per person for each of the weeks in our summer semester, and then about 10 hours for the fall semester, this is of course due drastic difference in time available between the two semesters. Assuming there are no drastic issues and as long as we keep within the average time budget per week we should be capable of coming in under the 2000 hour limit. To help aid in keeping the times properly lined up the team will be referencing the Microsoft project file to both keep track of their hopeful time allotted to each task as well as putting down their time for proper time management.

3.2 Materials Cost

Our budget of 800 dollars is a hard limit, and there is not a way to go over that limit at this time, however from initial research we have found that the parts required for our project range from 400-900 dollars in total, if we go for basic parts and utilize any useful old parts we should be easily capable of going under the 800 dollar limit, in the possible case of not having enough budget for parts the team shall share the cost between each other.
4 Earned Value Management

4.1 Overview
By monitoring planned progress versus actual work performed we will be able to attain a better understanding of not only where we are in the product schedule but how well we are performing. This form of progress tracking is essential in identifying when the team is behind schedule, over budget, and especially in the refinement of the schedule as we compare what we projected a task to cost in terms of man hours versus what effort was actually necessary (budgeted cost of work performed versus actual cost of work performed).

4.2 Reporting
Each team member will maintain task progress both in their engineering journals and by updating a commonly (cloud) accessible document. The document will serve as a simple reference for the project planner to reference when transferring tasks completed to our earned value tracking software.

4.3 Software
Team eCardiac will use Microsoft Project Plan to report earned value of the project. Project plan houses the work breakdown structure of the entire project and will easily facilitate the assignment of earned value for completed tasks. Start dates and due dates along with task allocation to team members will be stipulated for each task in the project file. Each member’s individual tasks will have an associated earned value field which will be populated with planned earned value once complete or zero while still in progress.

4.4 Metrics
Two key metrics that will be monitored are Schedule Performance Index (SPI) and Cost Performance Index (CPI). In concert they will be able to spot trends in our performance and, consequently, will aid us identifying possible risks or planning adjustments to our work schedule. Using these indices will require tracking of the following:

- Budgeted Cost of Work Performed (BCWP)
- Budgeted Cost of Work Scheduled (BCWS)
- Actual Cost of Work Performed (ACWP)

Microsoft Project facilitates their measure and so will be relatively easy to generate.
4.5 Monitoring Progress

At each week’s meeting we will present the current status of our SPI and CPI to get a gauge for our current progress/efforts. If simple scheduling adjustments are necessary we will assign necessary changes and notate any risks. If deeper concerns arise we will make sure all stakeholders are aware so that more involved planning will involve all affected parties.
5 Scope Management Plan

Team eCardiac will strictly limit our scope to our designated highest priority items. We realize that we are strictly confined to two semester’s time and have found it feasible to complete these requirements. After completion of the top priority requirements we may expand our scope to include other requirements.

Team eCardiac realizes that we are limited by our medical knowledge. It is possible that as we proceed we may come across areas that may need alterations. If a change is needed to be made we will follow the procedures described in section 9 of the project charter.
# 6 Work Breakdown Structure

## WBS For Senior Design 1

<table>
<thead>
<tr>
<th>WBS</th>
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<td>Tue 6/19/12</td>
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## WBS for Senior Design 2

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<td>Mon 8/20/12</td>
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## Work Breakdown Structure

### 2.5.12
- Weekly File Update
  - Wed 11/7/12
  - Wed 11/14/12
  - Wed 11/21/12
  - Wed 11/28/12

### 2.5.13
- Weekly File Update
  - Wed 11/7/12
  - Wed 11/14/12
  - Wed 11/21/12
  - Wed 11/28/12

### 2.5.14
- Weekly File Update
  - Wed 11/7/12
  - Wed 11/14/12
  - Wed 11/21/12
  - Wed 11/28/12

### 2.5.15
- Weekly File Update
  - Wed 11/7/12
  - Wed 11/14/12
  - Wed 11/21/12
  - Wed 11/28/12

### 2.6
**Presentation Preparations**
- ADS Gate Review
  - Mon 8/20/12
  - Wed 12/5/12
- DDS Gate Review
- Final Presentation

### 2.7
**Team Meetings**
- Meeting 1
  - Wed 8/22/12
  - Wed 8/22/12
- Meeting 2
  - Wed 8/29/12
  - Wed 8/29/12
- Meeting 3
  - Wed 9/5/12
  - Wed 9/5/12
- Meeting 4
  - Wed 9/12/12
  - Wed 9/12/12
- Meeting 5
  - Wed 9/19/12
  - Wed 9/19/12
- Meeting 6
  - Wed 9/26/12
  - Wed 9/26/12
- Meeting 7
  - Wed 10/3/12
  - Wed 10/3/12
- Meeting 8
  - Wed 10/10/12
  - Wed 10/10/12
- Meeting 9
  - Wed 10/17/12
  - Wed 10/17/12
- Meeting 10
  - Wed 10/24/12
  - Wed 10/24/12
- Meeting 11
  - Wed 10/31/12
  - Wed 10/31/12
- Meeting 12
  - Wed 11/7/12
  - Wed 11/7/12
- Meeting 13
  - Wed 11/14/12
  - Wed 11/14/12
- Meeting 14
  - Wed 11/21/12
  - Wed 11/21/12
- Meeting 15
  - Wed 11/28/12
  - Wed 11/28/12

### 2.8
**Risk Evaluations**
- Evaluation 1
  - Mon 8/20/12
  - Wed 12/5/12
- Evaluation 2
  - Wed 8/22/12
  - Wed 8/22/12
- Evaluation 3
  - Wed 8/29/12
  - Wed 8/29/12
- Evaluation 4
  - Wed 9/5/12
  - Wed 9/5/12
- Evaluation 5
  - Wed 9/19/12
  - Wed 9/19/12
- Evaluation 6
  - Wed 9/26/12
  - Wed 9/26/12
- Evaluation 7
  - Wed 10/3/12
  - Wed 10/3/12
- Evaluation 8
  - Wed 10/10/12
  - Wed 10/10/12
- Evaluation 9
  - Wed 10/17/12
  - Wed 10/17/12
- Evaluation 10
  - Wed 10/24/12
  - Wed 10/24/12
- Evaluation 11
  - Wed 10/31/12
  - Wed 10/31/12
- Evaluation 12
  - Wed 11/7/12
  - Wed 11/7/12
- Evaluation 13
  - Wed 11/14/12
  - Wed 11/14/12
- Evaluation 14
  - Wed 11/21/12
  - Wed 11/21/12
- Evaluation 15
  - Wed 11/28/12
  - Wed 11/28/12
7 Quality Management Plan

7.1 Purpose

The purpose of the quality management plan is to guarantee the project meets all specified requirements. The acceptance criteria will be focusing on overall safety, basic functionality, and the alert mechanism. The plan will lay out how the quality will be gauged and how each project’s component will be tracked throughout the course of architectural design and development process. The team eCardiac will closely adhere to the following guidelines to ensure the quality of the product.

7.2 Plan Components

7.2.1 Documentation

The team eCardiac’s document is composed of following components:

- Planning and Scope
  - System Requirements Specification
  - Project Charter
- Design
  - Architecture Design Specification
  - Detailed Design Specification
- Project Status Follow-Up
- User Manual

In order to uphold quality and consistency of formal documentation, each member of the team eCardiac will have to achieve following criteria:

- Requirement-Adherence
- Grammar and Spelling
- Accuracy
- Consistency
- Conciseness

Document publication guidelines to be followed:
• Each document segment assigned to each member must be completed and submitted 2 days prior to the due date.
• In case of emergency, each team member is responsible to notify the team immediately for task accommodation.
• All documents will be reviewed by the team as a whole before finalizing and publishing.
• Each published document will have a version number.
• All documents will be maintained and submitted through dropbox and UTA emails.

7.2.2 Hardware
In order for the hardware components of the product to consistently function as intended, a set of guidelines has been made:

• Each individual hardware component will be tested against its manufacturer specification to ensure it functions as intended and meets the hardware requirement.
• Each individual hardware component will have a back-up.
• Integrated hardware will be thoroughly tested against the requirements.
• Any use of hardware must be notified and logged.
• A set of fully charged batteries must always be ready.

7.2.3 Software
The main function of the software is to read data from the hardware then analyze it and dispatch the appropriate notification. To guarantee the product’s software functions as intended, software implementation must undergo the following steps:

• A Programming language that most of the team members are skilled with will be chosen.
• The team’s programming must adhere to the functional requirements of the project.
• Source code back-up is mandatory. Source control will be used.
• Programming knowledge and resources will be shared in case of a programmer is not able to complete the assigned work, another one will be standby to help.
• Coding status must be reported regularly.
• Module test must be done along with coding process.
• Non-programmers of the team will be primary software testers.
• Data input domain must be identified and make sure the software is able to handle it.
• The final product must be bug-free.
8 Communications Plan

8.1 Team Communication

8.1.1 Team Meetings
As scheduled, team eCardiac meets once a week on Wednesday from 3:30 pm to 5:30 pm. Additional meetings will be held as necessary. Each team member must have his task/assignment done before the team meeting. If for any reason a team member cannot join a team meeting, it is his responsibility to inform the team as soon as able to do so. Content of each meeting will be logged into each team member’s engineering notebook. Tasks will be allotted during the time of meeting. At the end of each meeting, the meeting’s resolutions will be recapped and emailed to each team member. Peers’ work review may take place at the meeting or at another time.

8.1.2 Means of Communication

8.1.2.1 Email
The team eCardiac decided to use email as the primary means of communication. As mentioned above, assignments and team meeting resolutions will be emailed to each team member.

8.1.2.2 Dropbox
The team has picked dropbox as the repository for documents and software source code. Once a team member accomplishes his job, he will upload his work to dropbox so that other members can access the work for review.

8.1.2.3 Cell Phone
Team members’ cell phone numbers had been exchanged for quick contacts, urgent problems or other issues that needs to be solved.

8.2 Communication with Department Manager and Mentor

8.2.1 Team Status Report and Presentation
Team status reports are held every week to inform the department manager of the current status of the project and its progress. Sections of each presentation will be broken down and each team member will undertake the material that suits them for presentation.

8.2.2 Mentor Contact
Communication between the team and the mentor is carried out via email.
9 Change Management Plan

9.1 Purpose of Integrated Change Management Plan
As professionals in a technical field we deal with a dynamic work environment. New technology is constantly improving and changing the way that we perform our work. Team eCardiac realizes that we are limited by our medical knowledge. Having no medical expert on our team makes us vulnerable to changes that occur due to new information. It is important that we have a standardized way of dealing with these changes. The following contains the policies and procedures that will follow to maintain these changes.

9.2 Roles and Responsibilities
Project Sponsor - none
Project Leader - The project manager decides if the change is worth considering.
Project Team - The project team will discuss the proposed change in great detail. We will go over the effects of the change and see how it affects our project scope. We will inquire about the cost estimations used and look for flaws in logic.

9.3 Review and Approval Process
If a change is proposed team eCardiac’s leader will go over the change control form. The leader will then decide if the change is beneficial to our product. Once approved for discussion team eCardiac will discuss the change in the weekly scheduled meeting. The team must approve the change by a majority vote before it will be confirmed. If the change is approved the necessary team members will be assigned to research the change.
9.4 Change Identification, Documentation, Implementation and Reporting

The first step in implementing a change is the change request form. Any team member as well as the project manager can request a change. The request form is eCardiac’s way of documenting changes to the original design. The requestor must specify the change as well as the risks and benefits of making the change. They must also give an estimated cost and a description of the process used for the estimation. The document must be signed by a majority of the team members. Once approved the cost analysis and the project plan will be adjusted.
<table>
<thead>
<tr>
<th>Date:</th>
<th>Change Description:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Benefits:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Risks:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Estimated Cost: ___ man months

Description of method used for cost estimation:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Project Leader__________________
Team Member__________________
Team Member__________________
Team Member__________________
Team Member__________________
Date Approved__________________

Figure 9-1: Change request form
10 Risk Management Plan

10.1 Purpose of Risk Management Plan
Any project can and most likely should contain a risk management plan, and as a primer to the real world experiencing risk management is an essential part in the learning process for Senior Design. For this project, due to a lack of experience in several areas, a lack of up to date documentation of management plans including risk management can be catastrophic; Without proper identification and response almost any project will collapse in on itself.

10.2 Roles and Responsibilities
- Project Sponsor: When he/she will feel necessary the sponsor should contact the team to help avoid or mitigate the issue that they are aware of.
- Project Manager: The project Manager like any other member of the team must bring up his concerns to the team and to the risk manager so they can properly adjust to the issue.
- Project Team: Each team member has a responsibility to report any risk triggers he may perceive on the horizon to the team as a whole, and directly to the risk manager.
- Risk Manager: The risk manager is responsible for anything to do with risk, from identification, to analysis, to response.

10.3 Risk Identification
All stakeholders are required to bring up risk triggers to the team however the Risk Manager themselves makes it his goal to actively watch for those triggers in all ways he can possibly perceive their onset.

10.4 Risk Triggers
Thus far our identified risk triggers for the eCardiac project are:
- Gate Review Failures
- Missed Meetings
- Class Absenteeism
- Lack of Timely Communication
- Supplier Problems
- Procrastination
- Other
10.5 Risk Analysis

<table>
<thead>
<tr>
<th>Risk</th>
<th>Probability</th>
<th>Loss</th>
<th>Risk Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overly Optimistic Schedule</td>
<td>30%</td>
<td>3.00 wk</td>
<td>0.90 wk</td>
</tr>
<tr>
<td>Supplier Shipping Problems</td>
<td>15%</td>
<td>0.50 wk</td>
<td>0.08 wk</td>
</tr>
<tr>
<td>Hardware Software Integration Inexperience</td>
<td>30%</td>
<td>8.00 wk</td>
<td>2.40 wk</td>
</tr>
<tr>
<td>Teammate Illness</td>
<td>40%</td>
<td>1.00 wk</td>
<td>0.40 wk</td>
</tr>
<tr>
<td>Limited Medical Knowledge Issues</td>
<td>50%</td>
<td>2.00 wk</td>
<td>1.00 wk</td>
</tr>
<tr>
<td>Hardware Failure</td>
<td>20%</td>
<td>5.00 wk</td>
<td>1.00 wk</td>
</tr>
<tr>
<td>Software Failure</td>
<td>20%</td>
<td>5.00 wk</td>
<td>1.00 wk</td>
</tr>
<tr>
<td>Burnout</td>
<td>20%</td>
<td>4.00 wk</td>
<td>0.80 wk</td>
</tr>
<tr>
<td>Feature Creep</td>
<td>30%</td>
<td>4.00 wk</td>
<td>1.20 wk</td>
</tr>
</tbody>
</table>

10.6 Risk Severity

<table>
<thead>
<tr>
<th>Risk</th>
<th>Priority</th>
<th>Strategy</th>
<th>Actions</th>
<th>Trigger</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overly Optimistic Schedule</td>
<td>Moderate</td>
<td>Accept</td>
<td>Continually update schedules from newly developing experience</td>
<td>Inexperience, Lack of Effort</td>
</tr>
<tr>
<td>Supplier Shipping Problems</td>
<td>Low</td>
<td>Accept</td>
<td>Continually check shipping information and find alternatives when need be.</td>
<td>Unknown</td>
</tr>
<tr>
<td>Hardware Software Integration Issues</td>
<td>High</td>
<td>Mitigate</td>
<td>Maintain contact with TA's and on campus aides for integration</td>
<td>Inexperience</td>
</tr>
<tr>
<td>Teammate Illness</td>
<td>Low</td>
<td>Accept</td>
<td>Assign other teammates to work during illness</td>
<td>Unknown</td>
</tr>
<tr>
<td>Limited Medical Knowledge Issues</td>
<td>Moderate</td>
<td>Mitigate</td>
<td>Maintain contact with medical experts</td>
<td>Inexperience</td>
</tr>
<tr>
<td>Hardware Failure</td>
<td>Moderate</td>
<td>Avoid</td>
<td>Do proper research into manufacturers and &quot;measure twice cut once&quot;</td>
<td>Manufacturing Error, Inexperience</td>
</tr>
<tr>
<td>Software Failure</td>
<td>Moderate</td>
<td>Avoid</td>
<td>Follow proper debugging procedures with all source code</td>
<td>Programming Error</td>
</tr>
<tr>
<td>Burnout</td>
<td>Low</td>
<td>Accept</td>
<td>Teammates will air their needs to the group and we will attempt to schedule evenly across the team.</td>
<td>Inexperience, Schedule Difficulties</td>
</tr>
<tr>
<td>Feature Creep</td>
<td>High</td>
<td>Mitigate</td>
<td>The Team will follow proper change management procedures.</td>
<td>Change Mismanagement</td>
</tr>
</tbody>
</table>
10.7 Risk Response Planning
Our response planning will fall mostly to our risk manager. Prioritizing the risks based on our derived risk level for all risks. The entire team of course will have some input when it comes to response planning but it still comes down to the logical processes of the risk manager.

10.8 Risk Documentation and Reporting
Our risk documentation will take the form of a Microsoft Excel spreadsheet updated whenever a risk assessment meeting takes place or whenever a team member brings to the risk manager’s attention that some risk may need to be observed more closely in the near future.

10.9 Risk Control
When it comes to the regular control and assessment of risks during our project we have been and shall continue to have one section of our weekly long team meeting dedicated to risk control. We shall speak in a roundtable of any warning signs that we may have noticed recently and the risk manager shall take down all applicable information gleaned from each of these meetings and then update the Microsoft excel spreadsheet as soon as possible. As we progress we should be able to identify certain triggers earlier and earlier hopefully becoming more efficient in our risk management as the project goes on.
11 Procurement Management Plan

11.1 Purpose of the Procurement Management Plan

Procurement management is necessary since time and money are limited. It acts as a filter to prevent funds expenditure on unnecessary or subpar items that could preclude critical component purchases and divert time from core project tasks. Proper procurement management, therefore, may spell the difference between success and failure of a project.

This section establishes how Team eCardiac will implement procurement management, or in a general sense, how the team will acquire needed components for product development when necessary components are not developed in house or have not already been obtained from previous projects.

11.2 Roles and Responsibilities

Procurement management is not the activity of a single actor, all stakeholders play a part. The following table describes the role played by each of the stakeholders in procurement.

<table>
<thead>
<tr>
<th>11.3 Role</th>
<th>11.4 Actor(s)</th>
<th>11.5 Responsibilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>CEO</td>
<td>Michael O’Dell</td>
<td>Approves selected purchases submitted for approval by COTR.</td>
</tr>
<tr>
<td>Project Manager</td>
<td>Marc Streeter</td>
<td>Serves as COTR, passing on requests for approval to CEO and keeps records of purchases made.</td>
</tr>
<tr>
<td>Project Team</td>
<td>Marc Streeter, Michael Flanagan, Minh Tran, Jose Miranda, Nicholas Skrobe</td>
<td>Identification, research, petition and integration of components.</td>
</tr>
<tr>
<td>Project Sponsor</td>
<td>Marcus Hanmer</td>
<td>Identification and recommendation of components.</td>
</tr>
</tbody>
</table>
11.3 Required Project Procurements and Timing

The acquisition of parts and components is a time sensitive process. After going through the approval process, if any parts cannot be obtained in a timely fashion, their projected utility fades. Careful procurement planning, therefore, will require that requests be fully analyzed and processed with sufficient buffer time in case of product arrival delays. The value of ‘sufficient buffer time’ will vary depending on the estimated time of arrival that external suppliers provide, but should be sufficient such that cancellation and reordering is possible without hindering progress of the project.

The budget allotted for the project has been set firmly at $800; therefore, each component purchase will require passage through a justification process. Part of the justification process will include whether eCardiac should produce a solution instead of purchasing one. Time, money, and probability of failure will all play an important role in this particular decision. Assuming an item is going to be purchased and having passed the justification process, ample market research will be necessary to ensure funding is properly planted. The final step, after an item is confirmed as being necessary and supplier election, will be CEO approval of purchases.

11.4 Description of Items/ Services to be acquired

This section details a tentative list of projected services and components that may be ordered from external services in order to complete the project.

- circuitry components
- a shirt
- sensors
- micro-controller
- components enclosure
- communications device
12 Project Closeout Report

12.1 The following are suggested sections for the Project Closeout Report:

12.2 Purpose of Closeout Report
On completion of the project a report will be conducted to assess the project to ensure that personnel, contract, administrative, and financial issues are resolved, that documents are archived, and lessons learned are captured.

12.3 Administrative Closure

12.3.1 Were the objectives of the project met?
Once the product has been developed it will be evaluated by the team members and compared to the SRS document. Any requirements not met will be documented along with an explanation of why this was the case.

12.3.2 Archiving Project Artifacts
All of the digital data for the project will be stored for future reference using more than one method. All of the documentation and code for the project will be on dropbox and in addition there will be a USB drive with a backup copy of the data updated weekly during the project. Once the final project documentation for the project is complete it will be copied onto a CD. Any individual member has their own responsibility of creating their own backup of the data if they desire using dropbox.

The following is a list of data to be stored:

- Financial records
- Status Reports
- Contract Files
- Change Requests
- Project Charter
- System Requirements Specification
- Source Code

12.3.3 Lessons Learned
Each team member shall record any lessons learned throughout the project in individual weekly status reports. These lessons if pertinent will be discussed in weekly meetings to aid in current and future project work to minimize mistakes.
12.3.4 Plans for Post Implementation Review (PIR)
After completion of the prototype it will be demonstrated to the supervisor. After the
demonstration a review will be conducted to receive and document any feedback on the project.

12.3.5 Final Customer Acceptance
After completion of the project there will be an online meeting with our sponsor, who lives in
Australia. We will then discuss why or why not the product was a success.

12.3.6 Financial Records
All financial transactions made throughout the project will be documented for our records. These
records will include information on invoices, budget estimates, and other related financial
information which will be copied for our digital records.

12.3.7 Final Project Performance Report
After completion of the project and any demonstrations, as well as any feedback is received from
our sponsor, other senior design teams, and the project supervisor a final performance report will
be made to summarize the project’s scope management, schedule performance, cost
performance, quality achievements, and a review of the risk containment performance. The
report will note any reasons for cost or schedule variances from our initial planning.