**SENIOR PROJECT MANAGEMENT PLAN**

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CSc 190 Senior Project

Department of Computer Science - College of Engineering and Computer Science

California State University, Sacramento

Version 4.5.2009

**1. INTRODUCTION**

This is the Project Overview Specification document for the RFID Triangulation and Inventory project sponsored by the NAND Solutions Group of Intel.

This project is being undertaken by Axon Guidance development team. The team is comprised of undergraduate students majoring in Computer Science at California State University, Sacramento. The team members are enrolled in a two-semester senior project course required of all undergraduate majors. Successful delivery of the desired software product will fulfill the senior project requirement for the student team members.

The identification of the project sponsor and the team are as follows:

PROJECT SPONSORS:

Svanhild Simonson

Validation Engineer

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Ronald Peroni

Validation Manager

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AXON GUIDANCE DEVELOPMENT TEAM:

Team Lead:

Steven Salmons

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Team Members:

Salil Nizar

Forrest Slater

Morgan Darke

* 1. **PURPOSE**

The Senior Project Management Plan will outline the Development Team's managerial and administrative procedures throughout the course of the project. It details the project overview, managerial process models, and outlines the scope of responsibility for each team member, the faculty advisor, and the sponsors. It also defines the team's assumptions, dependencies, constraints, and risk management procedures. Task scheduling, schedule control, and issue resolution are also outlined. The various forms stored in the Project Log are explained and attached as appendices.

* 1. **SCOPE**

This document does not contain an exclusive set of all managerial processes the group will utilize during the project. Also, it does not contain any specific technical details about the design and implementation of the product. More specific requirement specification, design, implementation, and testing documents will be provided throughout the course of this project. This lays the foundation as to the types of documentation and procedures that will be used to monitor the administrata involved in a project of this scale.

* 1. **DEFINITIONS AND ACRONYMS**
     1. **DEFINITIONS**

**Baseline**: A baseline is a work product that has been formally reviewed and accepted by the involved parties. A baseline is changed only through formal configuration management procedures.

**Software Requirements Specification**: Documentation of the essential requirements (functions/features/uses, performance, design constraints, and attributes) of the software and its external interfaces.

**Project Management Plan:** Documentation of how the team members will be managed, how progress will be measured, and how tasks will be distributed. The document will also include more detailed schedule information.

**Project Sponsor:** The customer. Due to the academic nature of this project, the sponsor has no financial responsibilities for the development of the product.

**1.3.2. ACRONYMS**

RFID: Radio Frequency Identification. Small antenna tags with memory storage containing identification information

PHP: PHP Hypertext Preprocessor. Web-based language to be used in the user interface.

SQL: Structured Query Language. A relational database system to be used in the project.

SSD: Solid State Drive, in this case NAND based hard disks.  
 OLE: Object Linking and Embedding, a Microsoft-specific method of distributing objects.

* 1. **OVERVIEW OF DOCUMENT CONTENTS**

Section 2: Project Overview – This section will summarize the key components of the senior project.

Section 2.1: Project Summary -- The product is comprised of three major components: passive RFID tags, RFID antennas, and the software bundle.

Section 2.2: Project Deliverables – Outlines the various products that will be delivered to the sponsor.

Section 2.3: Evolution of the SPMP – Baseline Change Requests will be drafted when updates to this, and all other, documentation are needed.

Section 3: Project Organization -- Outlines work flow, responsibilities, and interfaces.

Section 3.1: Process Model -- A graphical representation of work flow throughout the project is shown.

Section 3.2: Organizational Structure and Interfaces -- Lists the parties involved in the senior project and their responsibilities/interactions, including each team member, the faculty advisor, and the

sponsor.  
Section 3.3: Project Responsibilities -- The following describes the phases of work required in the

development of this product, as well as identify the individuals who will provide the

management and oversight necessary for successful completion.

Section 4: Project Management And Control – This section defines assumptions and constraints as well

as outlines the methods by which the team will address issues and scheduling.

Section 4.1: Project Management Objectives and Priorities -- The goal of the Development Team is to

create a useful tool that will improve the Sponsor's everyday working environment by

increasing productivity and reducing wasted time due to searching for lost or misplaced

assets.

Section 4.2: Assumptions, Dependencies, and Constraints -- This subsection should contain a detailed list of all assumptions being made by the project team as well as constraints placed upon the

team by the project sponsor.

Section 4.3: Risk Management -- A general analysis of the main project risk is discussed in this section.

Section 4.4: Change Management -- To ensure that changes are properly discussed, agreed upon,

recorded, and implemented, certain protocols will be followed.

Section 4.5: Schedule Control -- To ensure an accurate baseline schedule, project phases will be broken up into individual "tasks", which are then assigned and given an estimated completion date.

Section 4.6: Issue Resolution -- . To address any issues that occur, they must be disclosed,

acknowledged, recorded, and addressed.

Section 5: Technical Progress -- Details the tools, methods, and documentation involved in each major

phase of the project.

Section 5.1: Methods, Tools, and Techniques -- The project will be implemented using a

combination of UML, C, Java, PHP, and mySQL.

Section 5.2: Software Documentation -- A table listing each document to be generated along with a

description and its current estimated delivery date is given.

Section 6: Activities And Schedule

Section 6.1: Activities and Tasks -- A table listing start dates and end dates for project activities is given.

Section 6.2: Schedule -- A graphical table containing the school weeks alotted for each project activity is

given.

Section 6.3: Resource Requirements -- Though most senior projects do not incur a financial cost, this

project utilizes some development hardware, listed here.

Section 6.4: Budget -- A rough budget of man-hours and implementation hardware is listed.

Appendix A: Sample of the Team Meeting Agenda form.

Appendix B: Sample of the Team Member Report form.

Appendix C: Sample of the Sponsor Meeting Agenda form.

Appendix D: Sample of the Faculty Advisor Meeting Agenda form.

Appendix E: Sample of the Meeting Minutes form.

Appendix F: Sample of the Weekly Time Sheet form.

Appendix G: Sample of the Schedule of Project Work Phases form.

Appendix H: Sample of the Technical Review Summary form.

Appendix I: Sample of the Baseline Change Request form.

2. PROJECT OVERVIEW

2.1 PROJECT SUMMARY

The product is comprised of three major components: passive RFID tags, RFID antennas, and the software bundle. The software bundle will contain a 3-layered design. The first layer will involve writing an RFID transceiver driver to communicate and interpret responses from the hardware, to be written in C. The second layer involves the SQL database, which will be used to store RFID scan information and histories within a defined time frame. The third level will be the user interface, to be written in Java, PHP, and HTML, and will utilize the information stored within the SQL database and render it in a user friendly way.

The passive RFID tags are in the form of stickers, and will be placed on all assets that the customer wishes to track. The decision for passive tagging as opposed to active tags revolves around two main factors: size and power requirements. Active tags are much larger, thicker, and require a power source with a finite lifespan, which increases maintenance overhead. Passive tags are very small, flexible, and require no external power, and therefore require no maintenance besides replacement for possible damage. The information by which the assets are to be distinguished by can be written to the memory section of the tags, which are then read by any RFID antennas that tag is located near.

The array of RFID antennas are set up at various locations within the workspace and are responsible for detecting the RFID tags. The location detection algorithm works with varying signal strengths to record the distance between each RFID tag and antenna. This information, combined with a proprietary triangulation algorithm, will determine the position of each RFID tag within (ideally) a foot or two.

The database will hold all necessary information regarding the tagged assets. This information will include the serial number of each tag, the asset that serial number is coupled with, a timestamp, and the coordinates of that asset on a two-dimensional grid.

The web-based front end is responsible for allowing the user to add new assets into the database, and also provides the graphical grid layout of the workspace. The grid layout will display basic visual boundaries of the designated workspace as well the pinpointed assets that the user is looking for. The user may query a specific asset to be visually highlighted, as well as query any specific asset for more information. The front end of the system must be visually appealing, but also simple and intuitive. Three operational modes, potentially with different security and access rights provisions, will be available. The first is a "writing" mode, which allows new tag information to be written to an RFID tag -- this mode will be limited to a Lab Administrator level account. The second is an "inventory scan" mode, which will quickly query every antenna in the room on a set interval and keep track of what tags are in the room at the time of the scan. Finally, a "triangulate" mode will involve a more thorough scan and will output a location to a two-dimensional map (java applet) for each tag queried.

2.2 PROJECT DELIVERABLES

Upon completion of the project, the following will be delivered to the sponsor:

* Software Requirements Specification document. This document will be a more detailed description of the customer's requirements and the team's technical approaches to those requirements. This document will require customer's approval.
* Any development hardware provided, reimbursed, or purchased by the sponsor used in the creation of this software. Current development hardware has been purchased by the team and will remain their property.
* Software package including a compiled C driver, scripts to configure a SQL database with the appropriate tables/fields, and web interface including PHP/HTML front end and embedded java applets. This will be provided on a CD.
* User Guide documentation to also be included as a PDF or Word document on the CD. This will include instructions to set up and configure both hardware and software aspects of the product.

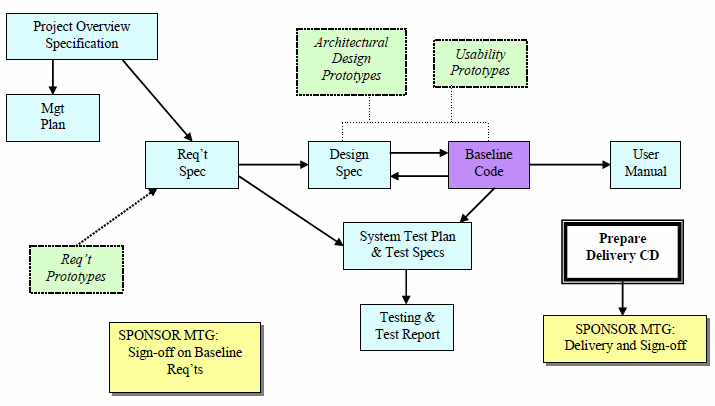
2.3 EVOLUTION OF THE SPMP

This document will serve as the "foundation" of how the project and team will be managed in terms of time allotment and measurement of progress. This document will contain the model by which all work and information will flow -- it serves to monitor and control all work required in all phases of the project. Due to volatility in scheduling a two-semester project with four group members, modifications to the timeframes and progress criteria will need to be made. Baseline Change Requests will be drafted when updates to this, and all other, documentation are needed. When evaluating progress of individuals as well as the team as a whole, this document will be used as a basis of analysis.

3. PROJECT ORGANIZATION

3.1 PROCESS MODEL

Below is a graphical representation of the work flow of all phases of the Senior Project. The left side, up to and including "Requirements Specification," is contained within the first semester. All sections to the right of the Requirements Specification occur in the second semester.



3.2 ORGANIZATIONAL STRUCTURE AND INTERFACES

While each member of the Development Team contain areas of expertise, due to the academic nature of the project, each team member will be involved in all phases of both documentation and design to some extent. Below are a listing of main roles and specialties:

Steven Salmons -- **Project Lead**: Team responsibilities include acting as main contact for the sponsor, as well as ensuring that schedules and performance expectations are kept. Implementation emphasis is on low-level coding in C, C++, as well as algorithm design and implementation. Also proficient in LAMP (Linux, Apache, mySQL and other relational databases, and PHP), he will specialize in the user interface design as well.

Salil Nizar: Main team responsibilities include team managerial tasks such as agendas, meeting minutes, and coordinating schedules. Implementation emphasis will be working with Steven on the low level design, with a focus on C to SQL OLE coding.

Morgan Darke: Resident Java Guru, his focus will be on designing the graphical applet used in the triangulation feature of the front end.

Forrest Slater: Implementation focus will be on design of the relational database as well as SQL-to-Java communication. He will also assist Morgan in design of the graphical applet to be imbedded within the PHP user interface.

As noted above, the main interface between the Project Sponsor and Development Team is Team Lead Steven Salmons. Salil Nizar will act as the main interface between the team and its Faculty Advisor, Ying Jin. The role of the Faculty Advisor focuses on ensuring all documentation generated by the team meets Computer Science department quality guidelines and requirements, as well as assist the team with any technical or logistical issues that may arise.

When interacting with the Sponsors and their parent company, Intel Corporation, there are some managerial and administrative boundaries to define. The Sponsor's role is tied directly to all output-specific tasks such as deadlines and time frames. However, internal processes such as implementation techniques and work load management are beyond the Sponsor's boundary. Likewise, it is critical that the Development Team respect the requirements as defined by the Sponsor and not overstep its role in implementing those specified features.

3.3 PROJECT RESPONSIBILITIES

The following describes the phases of work required in the development of this product, as well as identify the individuals who will provide the management and oversight necessary for successful completion:

1. Establishment of Vision and Scope of the Project: In this phase, the focus is on developing a relationship between the team and project sponsor. Basic expectations and understandings are developed to form a foundation for the project. The deliverable is this Project Overview Specification document, to be approved by the sponsor. Steven Salmons and the Project Sponsors will manage the documentation. The Faculty Advisor will provide draft oversight. **Estimated Timeline: 3/6/09 to 4/3/09**
2. Development of a Project Management Plan: This phase centers around designing a formal plan regarding the team's approach to the project. Managerial processes, expectations of team behavior and output, and work distribution and timeframes will be outlined. A Project Management Plan will be created, and does not require sponsor approval. Steven Salmons will manage the design of this document, with the Faculty Advisor providing draft oversight. **Estimated Timeline:** **3/27/09 to 4/13/09**
3. Elicitation, Analysis, Validation, and Publishing of Software Requirements: As the technical foundation of the project, this phase involves detailed analysis of each aspect of the customer's requirements and the technical approaches to be utilized to meet those requirements. This is the first document which will contain technical aspects of the project, and requires the sponsor's approval. Steven Salmons and the Project Sponsors will manage the design of the documentations, and the Faculty Advisor will provide draft oversight. **Estimated Timeline: 4/13/09 to 5/01/09**
4. Design, Implementation, and Prototyping of Software: This phase involves a more detailed technical analysis of how the requirements will be implemented in their appropriate languages. Also included in this phase is the prototyping of proof-of-concept software. This phase concludes with the implementation of the design in code. A Software Design Specification document, as well as the prototype and final code, will be produced in this phase. Steven Salmons will manage the design of the C and PHP coding. Salil Nizar will manage the coding of the C to SQL interface. Morgan Darke will manage the design of the Java graphical applet. The documentation will be managed by Steven Salmons, with the Faculty Advisor providing draft oversight. **Estimated Timeline: 9/1/09 to 10/30/09**
5. Software Testing and Validation: Test cases will be formed and executed for each feature to validate the software and ensure it properly meets the defined requirements. This phase will occur as the software is implemented. A Software Test Specification document will be created to outline this process, and requires the sponsor's approval. Salil Nizar will manage the software validation. Steven Salmons and the Project Sponsors will manage the documentation, with the Faculty Advisor providing draft oversight. **Estimated Timeline: 9/30/09 to 11/30/09**
6. Preparation and Delivery of Final Product: User documentation will be authored for the software and a CD containing the code and manual will be produced. A sample hardware environment will be set up for the customer to demonstrate the product. The user documentation requires sponsor approval. Forrest Slater will oversee the final product preparation, while Steven Salmons will manage the user documentation. The Faculty Advisor will provide draft oversight. **Estimated Timeline: 12/1/09 to 12/15/09**

4. PROJECT MANAGEMENT AND CONTROL

4.1 Project Management Objectives and Priorities

The goal of the Development Team is to create a useful tool that will improve the Sponsor's everyday working environment by increasing productivity and reducing wasted time due to searching for lost or misplaced assets. Equally important, we seek to achieve this goal in an organized, orderly fashion by applying the managerial techniques learned throughout the course of this project. All administrative processes will be contained in the Senior Project Log, which will house the following documents:

* **Team Meeting Agendas** -- This form outlines the major topics tackled at each and every team meeting. There is a minimum of one 1-hour team meeting per week, but more agendas may be present depending on the number of extra team meetings needed throughout the course of the project. See APPENDIX A.
* **Team Member Reports** -- These act as time accounting sheets for each team member on a weekly basis, indicating any assignments given to or meetings attended by each person. Each individual indicates the number of hours spent on each task, as well as the percentage of completion of that task in the last week. See APPENDIX B.
* **Sponsor Meeting Agendas** -- Like the Team Meeting agendas, this serves as a record of major topics discussed at each sponsor meeting. The number of sponsor meetings throughout the course is difficult to predict, but there will be at least one per major document requiring sponsor approval. See APPENDIX C.
* **Faculty Advisor Meeting Agenda** -- This form records major topics discussed in Faculty Advisor meetings. There will be approximately one meeting a week, as determined by the Advisor. See APPENDIX D.
* **Meeting Minutes** -- Each meeting agenda will be complemented by a more detailed report of minutes, detailing the content of each meeting more specifically. These minutes can be referenced to verify any assignments or deadlines given in case of dispute. See APPENDIX E.
* **Weekly Time Sheet** -- This weekly form serves as a time accounting mechanism of hours per week per assignment spent by each team member. Also included are percentage complete indicators for each project component. A running tally is kept of the entire semester's hour allotment on the bottom of the sheet, while the top contains the most current week's figures. See APPENDIX F.
* **Schedule of Project Work Phases --** This document serves as a master list of each major project phase and their timelines. This document will be crucial in evaluating the current vs. expected progress at various stages of the project. See APPENDIX G.
* **Technical Review Summary** -- These forms will contain any major technical changes requested by team members for document drafts. See APPENDIX H.
* **Baseline Change Request --** Any changes needing to be made on a completed and signed Software Requirements Specification document, Design Specification document, design implementation, database, or timeline requires this form. See APPENDIX I.
* **Decision Traceability Matrix --** This form contains a cross-reference table linking key decisions to the date or dates of agendas and minutes in which these key decisions were reported. This will serve as an index into the agenda and minute logs. See APPENDIX J.

4.2 ASSUMPTIONS, DEPENDENCIES, AND CONSTRAINTS

The following list outlines the project constraints placed upon the team:

1. All work on the project must be completed no later than the last day of instruction of CSC 191 (12/18/2009).

2. The installation hardware purchase is beyond the scope of the Senior Project, and therefore is not the responsibility of the team.

3. The software will be designed to work in the lab environment intended for this particular project. While future expandability is a feature worth investigating, the team will only do so if time permits.

4. Average turnaround time when obtaining faculty approvals for documentation is expected to be two weeks.

5. The product will be designed around the current Intel networking and database environment, with no anticipation that the environment will change during the course of the project.

6. Deliverables will include only software and documentation -- development hardware used will remain with the project team unless the sponsor reimburses the financial cost of the hardware.

7. The Sponsor is responsible for supplying and configuring any hardware required for all software components, including the C/SQL daemon, PHP front end, and Java applet.

4.3 RISK MANAGEMENT

Due to the complex nature of this project when compared to the majority of Computer Science senior projects, it has a higher occurrence of risk. Due to this fact, risk management protocols will be defined to ensure they are identified and prioritized. Depending on the severity, identified risks are to be avoided or mitigated via alternatives or corrective action.

Because of the "off label use" of critical hardware components involved in this project, performance and feasibility of the hardware is a major risk. To counteract this, we have defined a strict "minimum success criteria" which we know can be met by the "defined" use of the hardware. As we know for certain that RFID tags can be located on a per-antenna basis, a "per-antenna" granularity of triangulation is defined as our "minimum criteria." While we intend on much finer granularity, at worst, our risk involves creating a product that "only" meets the minimum defined. By establishing with the sponsor the understanding of this "worst case scenario," we can devote development time to more experimental approaches to triangulation while ensuring our customer that the agreed to minimums can be met.

Currently, the hardware limitations are our only potential risk involved -- as more come up, this section will be updated to identify those risks.

4.4 CHANGE MANAGEMENT

The high volatility of software design practices ensures that some aspects of the project will change and evolve over time. To ensure that changes are properly discussed, agreed upon, recorded, and implemented, certain protocols will be followed. For any documentation involving Sponsor approval, if changes are to be made, Baseline Change Request forms are to be filled out and given to both the Sponsor and Faculty Advisors for approval. Any Baseline Change Request forms will be stored in the Project Log for recording purposes, and the appropriate document will be updated. For documentation that does not require signed approval from the Sponsor, Baseline Change Requests will still be generated for any versions of documentation that have undergone Faculty oversight. Pre-approval draft changes will be monitored and logged via the Technical Review forms. For implementation changes, Technical Review forms will be managed by each component's manager as outlined in Section 3.3. Like the Baseline Change Requests, Technical Review forms will also be stored in the Project Log.

4.5 SCHEDULE CONTROL

As the development team begins to understand each other's working habits and effective performance, timeframe estimates will become more accurate. To ensure an accurate baseline schedule, project phases will be broken up into individual "tasks", which are then assigned and given an estimated completion date. A task will be clearly defined in scope and specifically assigned to one or more team member. Also, every task will produce a tangible product. Any changes required to the baseline schedule require approval from the Project Team Lead and must be given ahead of the expected turn in date. If a task goes over time without approval, oversight on the task by its assigned manager will increase, and priority will be shifted towards overdue deliverables. If the completed product does not meet quality standards of its task manager or the Team Lead, its time frame will be extended and its priority/oversight increased. Progress will be checked regularly -- roughly every quarter of the assigned time frame, a progress briefing will be held online, with major project briefings occurring at the weekly team meetings.

4.6 ISSUE RESOLUTION

Issues, both technical and managerial, will arise throughout the project's life. To address any issues that occur, they must be disclosed, acknowledged, recorded, and addressed. Disclosure will depend on urgency -- for time sensitive issues, disclosure may happen immediately by phone with the task or project lead. Less sensitive issues may be discussed at progress briefings or the team weekly meeting. Once disclosed, the task or project lead will acknowledge and record the issue on the Issue Resolution form. If disclosed to the task manager and he feels the issue requires full group discussion, he can elevate it to the project lead. Addressing issues will involve any applicable parties, whether it be a morale issue with one individual, a dispute issue between two or more team members, or a technical issue that affects the project (and therefore involves the whole team). Any issues that go beyond the scope of the Senior Project, such as team member health issues or requirement change requests by the sponsor that will extend the project beyond its previously agreed to scope, will require intervention by the Faculty Advisor.

# 5. TECHNICAL PROGRESS

## 5.1 METHODS, TOOLS, AND TECHNIQUES

We will use UML diagrams to represent the software component of the project. This will consist of Use Cases to encapsulate the requirements of the project and to represent the data storage requirements. The project will be implemented using a combination of C, Java, PHP, and mySQL.

## 5.2 SOFTWARE DOCUMENTATION

|  |  |  |
| --- | --- | --- |
| **DOCUMENT** | **DESCRIPTION** | **ESTIMATED DELIVERY DATE** |
| Project Overview Specification | Overview of the project. Contains the scope of the project. | 4/10/09 |
| Project Management Plan | Contains the management details describing how the team will complete project. | 4/17/09 |
| Software Requirements Specification | Contains the requirements that the project must satisfy. | 5/15/09 |
| Software Design Specification | Contains a description of the design methodology of the software. | 9/18/09 |
| System Test Plan and Test Cases | Contains the methodology for testing the system. | 10/09/09 |
| Software Test Report | Contains the results of testing the system. | 11/30/09 |
| User Manual | Describes how to use the system, from the point of view of an end-user. | 11/30/09 |

|  |  |  |
| --- | --- | --- |
| **PROJECT PHASE** | **PHASE DELIVERABLE** | **MILESTONES** |
| Establish the Vision and Scope of the Project | Project Overview Specification | Complete 1st Draft.  Review Draft within team.  Submit Draft to Faculty Advisor.  Submit Draft to Project Sponsor.  Approve Document. |
| Develop and Define Project Management Plan | Project Management Plan | Complete 1st Draft.  Review Draft within team.  Submit Draft to Faculty Advisor.  Approve Document. |
| Elicit, Analyze, Specify, Validate, and Publish Requirement Specification | Software Requirement Specification | Complete 1st Draft.  Review Draft within team.  Submit Draft to Faculty Advisor.  Submit Draft to Project Sponsor.  Approve Document. |
| Design the Software | Software Design Specification | Approve SRS.  Complete 1st Draft.  Review Draft within team.  Submit Draft to Faculty Advisor.  Approve Document. |
| Define System Test Plan and Necessary Test Cases | System Test Plan and Test Cases | Approve SRS.  Complete 1st Draft.  Review Draft within team.  Submit Draft to Faculty Advisor.  Approve Document. |
| Perform System Testing and Publish Results | Software Test Report | Implement SDS.  Complete 1st Draft.  Review Draft within team.  Submit Draft to Faculty Advisor.  Approve Document. |
| Prepare Final Materials for Delivery To Sponsor | Software Delivery Materials (Including User Manual and CD) | Approve STR.  Complete 1st Draft of User Manual.  Review Draft within team.  Create CD.  Submit Draft to Faculty Advisor.  Submit to Project Sponsor for Approval. |

# 6. ACTIVITIES AND SCHEDULE

## 6.1 ACTIVITIES AND TASKS

When the project enters a new phase, this section will be updated with the Work Breakdown Structure (WBS) for that phase.

Elicit, Analyze, Specify, Validate, and Publish Requirement Specification

**Software Requirements Document:**

|  |  |  |
| --- | --- | --- |
| ACTIVITY | START DATE | END DATE |
| Complete Section 3 | 4/3/09 | 4/17/09 |
| Complete 1st Draft | 4/17/09 | 4/24/09 |
| Team Review | 4/24/09 | 4/29/09 |
| Faculty Advisor Review | 4/29/09 | 5/6/09 |
| Faculty Advisor Approval | 5/8/09 | 5/11/09 |
| Sponsor Approval | 5/12/09 | 5/15/09 |

Design the Software

**Software Design Specification:**

Define System Test Plan and Necessary Test Cases

**System Test Plan and Test Cases:**

Perform System Testing and Publish Results

**Software Test Report:**

Prepare Final Materials for Delivery To Sponsor

**User Manual:**

## 6.2 SCHEDULE

The following table represents a tentative time of when each phase of the project will begin and end.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| CSc 190  PHASES | WEEK | | | | | | | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| POS |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| PMP |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Prototypes |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| SRS |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | | | | | | | | | | | | | | | |
| CSc 191  PHASES | WEEK | | | | | | | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| Prototypes |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| SDS |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| CODE |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| STS |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Test +STR |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| UM |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Del. CD |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

## 6.3 RESOURCE REQUIREMENTS

Though most senior projects do not incur a financial cost, this project utilizes some development hardware. Currently, the costs of this hardware are being covered by the Senior Project Team. The development hardware consists of:

* 1 RFID Transceiver
* RFID Antennas
* RFID Tags
* Antenna Cabling

## 6.4 BUDGET

In terms of man-hours for development, the following provides a rough estimate of the per-phase requirements:

|  |  |  |
| --- | --- | --- |
| **Project Phase** | **% of Work** | **Est. Hours** |
| Establishment of Vision and Scope of the Project | 4% | 35 |
| Development of a Project Management Plan | 4% | 35 |
| Elicitation, Analysis, Validation, and Publishing of Software Requirements | 15% | 120 |
| Design, Implementation, and Prototyping of Software | 30% | 250 |
| Software Testing and Validation | 7% | 60 |
| Preparation and Delivery of Final Product | 2% | 15 |
| Learning and Developing Skills Needed To Complete Project | 13% | 110 |
| Managerial Procedures, Project and Team | 25% | 200 |
| **Totals:** | **100%** | **825** |

For a 'true implementation' of this system, the following hardware costs would be incurred:

|  |  |  |
| --- | --- | --- |
| **Item** | **Quantity Needed** | **Price** |
| RFID Transceiver | 1 for every 8 antennas | Est. $700 ea. |
| RFID Antennas | Est. 4 for every 50 sq. ft | Est. $100 ea. |
| RFID Tags | 1 per item to track | Est. $0.15 ea. |
| Antenna Cabling | 1 cable per antenna | Est. $15 ea. |

**Axon Guidance**

**Sign-Off Sheet**

**Faculty Advisor**

Dr. Ying Jin, Faculty Advisor, CSUS \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Axon Guidance**

Steve Salmons, Project Manager, Axon Guidance \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Salil Nizar, Team Member, Axon Guidance \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Morgan Darke, Team Member, Axon Guidance \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Forrest Slater, Team Member Axon Guidance \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Appendix A: Sample of the Team Meeting Agenda form.

**Senior Project**

**TEAM MEETING AGENDA**

**Team Name:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

|  |  |  |  |
| --- | --- | --- | --- |
| Date | Start time | | End time |
| ***TEAM MEMBERS:*** | | |  | | |
| 1. | | | Present: ❑Absent: ❑ | | |
| 2. | | | Present: ❑Absent: ❑ | | |
| 3. | | | Present: ❑Absent: ❑ | | |
| 4. | | | Present: ❑Absent: ❑ | | |
| 5. | | | Present: ❑Absent: ❑ | | |
| 6. | | | Present: ❑Absent: ❑ | | |

Agenda prepared by: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**AGENDA ITEMS (*The first three items are required; however each team will have their own set of additional items. In preparing the minutes, copy the agenda and add comments for each item on the agenda, indicating both decisions and assignments made. If an item was not addressed during the meeting, merely indicate that the item was not discussed. The minutes should account for how each agenda item was handled*.)**

**1.** Review and approve **Minutes** of previous week’s meeting.

*Minutes should be prepared and distributed immediately after the meeting in order to verify that assignments and decisions made during the meeting are understood by all team members. Any questions should be raised immediately in order to verify that the assigned work and the decisions are understood by all team members. Consequently, this item should not take much* *time*.

**2.**  Review last week’s work assignments. A current WBS is to be used to identify weekly tasks.

*Last week’s minutes should contain the list of tasks assigned to each team member. Copy that list into this agenda and fill-in the status information reported by each team member. A table like the one provided below should be used to record the information. The status information would be 1) the “Percent Complete” and 2) whether or not the “Status” indicates “on schedule or not”.*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| ***Last Week’s Assignments*** | ***Team Member*** | ***Hours*** | ***Percent Complete*** | ***Status***  ***(on schedule or not)*** | ***Carryover to***  ***Next Week*** |
| *Copied list of tasks assigned* |  |  |  |  | ❑ Yes ❑ No |

*If a schedule change is called for, the WBS should be revised and discussed at the team’s meeting with their Faculty Adviser. If the completion date for the entire phase of work needs to be changed, the Phase Schedule should be updated and discussed with the Team’s Faculty Adviser and a baseline change form submitted to the Seminar instructor.*

*Included in this discussion item should be a review the distribution of work to ensure that members are sharing equally in the work. If necessary, readjust the assignments to correct for unequal distribution of work.*

*Included in this agenda item is completion and verification of the team’s weekly TIME & STATUS REPORT which is to be submitted in class.*

*Review and approve each team member’s “Time and Status Report” for the prior week’s assignments. Each team can create their own system for reporting. The appendix to this document contains a sample reporting form template that the team might choose to use (the electronic version is available on the senior project webpage). The team should keep these weekly team member reports in a separate folder for auditing purposes. However, do not include them in your Project Log. The agenda and minutes are sufficient.*

*The agenda should provide for the following summary, indicating whether or not the reports were submitted.*

|  |  |
| --- | --- |
| ***Report Submitted*** | ***TEAM MEMBERS*** |
| ❑ Yes ❑ No | 1. |
| ❑ Yes ❑ No | 2. |
| ❑ Yes ❑ No | 3. |
| ❑ Yes ❑ No | 4. |
| ❑ Yes ❑ No | 5. |
| ❑ Yes ❑ No | 6. |

**3. New Assignments.** *List as* ***new assignments*** *those tasks identified in the WBS that are scheduled to begin in the coming week. Indicate the team member or members that will be assigned to each and the “Due Date” as indicated in the WBS.*

|  |  |  |
| --- | --- | --- |
| ***New Assignments*** | ***Team Member*** | ***Due***  ***Date*** |
| *The list of assignments for next week…* |  |  |

*Note. These new assignments and the carryover assignments would be included in next week’s agenda for discussion under item two of the agenda.*

4. All meetings held in the previous week. *Review all other meetings held in the past week and verify the times spent in these meetings. The meetings would include the Monday (190) or Wednesday (191) meetings, the weekly Faculty Adviser meeting and any additional meetings (for example, a sponsor/user meeting, a Technical Review meeting, and/or any meetings with two or more team members). The team should review and record any* ***issues*** *raised and/or follow-up work needed as a result of any of these meetings. The team should use this agenda item to verify that the issues are being addressed and any additional work needed will be assigned and completed. Obviously the issues and follow-up work should be included in the minutes for this meeting*

*The time spent in these meetings should be assigned to the appropriate category and recorded for each team member in attendance. The team should formalize a process for collecting and/or recording this data.*

*NOTE. The* ***issues*** *raised should be added to the “Key Decisions” table which is to be included in the Project Log. All issues should be tracked; from the meeting in which they were raised until the meeting in which they are resolved/closed. The “Key Decisions” table should contain references to the minutes of all meetings in which these issues were discussed.*

**5**. Meetings in the coming week: *Discuss next week’s meetings to verify attendance and ensure pre-meeting preparation has been or will be completed before the meeting. For example:*

|  |  |  |  |
| --- | --- | --- | --- |
| *Phase of Work:* | *Purpose of Meeting* | *Date* | *Team Member(s)in charge \** |
| Faculty Adviser | Weekly meeting | xx/xx/xx |  |
| SRS | Technical Review | xx/xx/xx |  |
| SRS | Sponsor Meeting to go over Req’t Prototypes | xx/xx/xx |  |
| **…** |  |  |  |

*\* The team member responsible for Meeting Preparation, agenda and minutes.*

**OLD business items**. *These* *would be items carried over from a previous meeting. Assign an agenda item number for each.*

**NEW business items.**  *These would be items placed on the agenda by the team’s Project Manager and any team member*: *Assign an agenda item number for each.*

Last agenda item: Review decisions and assignments. Identify “Key Decisions” and/or issues that should be included in the Project Log’s appendix.

Minutes to be prepared by:

|  |  |  |
| --- | --- | --- |
| **Next Team Meeting Date:** | **Start time** | **End time** |

**REPORT RECORDING TEMPLATES (Excel versions are available on the senior project website):**



Appendix B: Sample of the Team Member Report form.



Appendix C: Sample of the Sponsor Meeting Agenda form.

**SPONSOR MEETING AGENDA**

**Team Name:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

|  |  |  |  |
| --- | --- | --- | --- |
| Date | Start time | | End time |
| ***TEAM MEMBERS:*** | | |  | | |
| 1. | | | Present: ❑Absent: ❑ | | |
| 2. | | | Present: ❑Absent: ❑ | | |
| 3. | | | Present: ❑Absent: ❑ | | |
| 4. | | | Present: ❑Absent: ❑ | | |
| 5. | | | Present: ❑Absent: ❑ | | |
| 6. | | | Present: ❑Absent: ❑ | | |

Agenda prepared by: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

|  |  |  |
| --- | --- | --- |
| **Met with the following Project Sponsor/Clients** | | |
| 1. |
| 2. |
| 3. |
| 4. |
| 5. |
| 6. |

**AGENDA ITEMS** (*In preparing the* ***Meeting Report****, copy the agenda and add comments for each item on the agenda, indicating both decisions and assignments made. If an item was not addressed during the meeting, merely indicate that the item was not discussed. The minutes should explain how each agenda item was handled*.):

1. Review and approve **Meeting Report** for the last meeting.

*The Report should be prepared and distributed to team members immediately after the meeting in order to verify that assignments and decisions made during the meeting are correctly stated. After receiving team member approval, the Report should be transmitted to the sponsor. As agreed to in the Project Overview Specification document, the sponsor should respond in a timely manner in order to ensure that the team correctly represented the issues and decisions agreed to at the meeting. When the team meets again, approval of the Meeting Report should be merely a formality. However, each team should invest time and effort in preparing these reports, for this investment provides an important and valuable audit trail to issues raised and decisions made. These reports serve as an important record of the sponsor’s expectations.*

**OLD business items**. *These* *would be items carried over from a previous meeting. Assign an agenda item number for each.*

**NEW business items.**  *These would be items placed on the agenda by the team’s Project Manager and any team member*: *Assign an agenda item number for each.*

***Meeting Report*** to be prepared by:

|  |  |  |
| --- | --- | --- |
| **Next Team Meeting Date:** | **Start time** | **End time** |

Appendix D: Sample of the Faculty Advisor Meeting Agenda form.

**Senior Project**

**TEAM MEETING WITH PROJECT ADVISER**

**Team Name:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

|  |  |  |  |
| --- | --- | --- | --- |
| Date | Start time | | End time |
| ***TEAM MEMBERS:*** | | |  | | |
| 1. | | | Present: ❑Absent: ❑ | | |
| 2. | | | Present: ❑Absent: ❑ | | |
| 3. | | | Present: ❑Absent: ❑ | | |
| 4. | | | Present: ❑Absent: ❑ | | |
| 5. | | | Present: ❑Absent: ❑ | | |
| 6. | | | Present: ❑Absent: ❑ | | |

Agenda prepared by: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**AGENDA ITEMS:**

1. **Review and approve the minutes of the previous week’s Faculty Adviser meeting.**
2. **Review “Weekly Status Report”**. Review the prior week’s reported work, including team member tasks (the times reported, the work completed and work yet to be done). The status report should reflect the impact of the prior week’s work on the phase\* reported in the Project Schedule and detailed in the associated Work Breakdown Structure (WBS).

\* The Project Work Phases are the following: POS (Project Overview Specification), PMP (Project Management Plan), Req't Prototypes, SRS (Software Requirements Specification), Requirements Review with Sponsor, Architectural Design Prototypes, Usability Prototypes, SDS (Software Design Specification), BASELINE CODE, STS (System Test Plan & System Text Cases), TESTING & STR (System Testing & System Test Report), UM (User Manual), DELIVERY–CD, and he Delivery Meeting with Sponsor.

At the start of each phase of work, the team is to prepare a WBS which shows the week by week list of tasks necessary to complete the phase. If the completion milestone for the phase is an approved document, the Technical Review and delivery of the draft document to the Faculty Adviser should be included in the WBS. The initial WBS and updated versions of the WBS are to be submitted to the Faculty Adviser. *Note*. *If needed, the team’s Faculty Adviser will work with the team in preparing the WBS*.

The WBS is to be used to assign team members to weekly tasks. The team is to review with the Faculty Adviser the previous week’s assigned work and the status of the work yet to be done. This review should be similar to the review the team performs at their weekly meeting. If the project schedule for the phases of work and/or the WBS need to be updated, this should be discussed with the Faculty Adviser.

**3.** If the team has met with the sponsor in the previous week, review minutes of meeting (*Note. Sponsor meetings should be included in the WBS*). In addition, the team should discuss with the Faculty Adviser the current state of the team’s relationship with the sponsor, especially if there has been any changes and/or issues raised.

**OLD business items**. *These* *would be items carried over from a previous meeting. Assign an agenda item number for each.*

**NEW business items.**  *These would be items placed on the agenda by the team’s Project Manager, any team member and/or the Faculty Adviser*: *Assign an agenda item number for each.*

*NOTE: Drafts of all documents must be submitted to the team’s Faculty Adviser for review. The Adviser will review with the team whatever revisions are necessary. For the first draft of a document, this review would be indicated as a NEW Business item. For subsequent drafts, the reviews would be listed under OLD Business.*

Appendix E: Sample of the Meeting Minutes form.

Same as Meeting Agenda form.

Appendix F: Sample of the Weekly Time Sheet form.



Appendix G: Sample of the Schedule of Project Work Phases form.



Appendix H: Sample of the Technical Review Summary form.

CHECK THE ITEM BEING REVIEWED: DATE:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| POS | SRS | STS | | UM | |
| SPMP | SDS | STR | | Other (specify below) | |
| MEMBER | | |  | |  |
| 1. | | | AUTHOR:  | | REVIEWER:  | |
| 2. | | | AUTHOR:  | | REVIEWER:  | |
| 3. | | | AUTHOR:  | | REVIEWER:  | |
| 4. | | | AUTHOR:  | | REVIEWER:  | |
| 5. | | | AUTHOR:  | | REVIEWER:  | |
| 6. | | | AUTHOR:  | | REVIEWER:  | |

DESCRIPTION OF ITEM AND REVIEW MATERIALS:

|  |  |
| --- | --- |
| MEETING  TYPE: |  |
|  | Initial Inspection |
|  | Re-inspection |

SUMMARY OF REVIEW FINDINGS:

(Include any related issues affecting other items than the Item being reviewed)

RECOMMENDATION:

|  |  |  |  |
| --- | --- | --- | --- |
| Accepted (No further review needed) | | Not Accepted | |
|  | As is |  | Major revisions (Reinspection required) | |
|  | With minor revisions |  | Review not completed (to be continued) | |

INCLUDE THE “ISSUES LIST” PROVIDED BY EACH REVIEWER (the standard template is including on the next page).

CHECK THE ITEM BEING REVIEWED: DATE:

|  |  |  |  |
| --- | --- | --- | --- |
| POS | SRS | STS | UM |
| SPMP | SDS | STR | Other (specify below) |

TEAM MEMBER NAME

COMMENTS AND QUESTIONS:

|  |  |  |
| --- | --- | --- |
| ISSUE: | SECTION No. & PAGE | CHANGE |
|  |  | Yes No |
|  |  | Yes No |
|  |  | Yes No |
|  |  | Yes No |
|  |  | Yes No |
|  |  | Yes No |
|  |  | Yes No |
|  |  | Yes No |
|  |  | Yes No |
|  |  | Yes No |
|  |  | Yes No |
|  |  | Yes No |

|  |  |  |
| --- | --- | --- |
| ISSUE: | SECTION No. & PAGE | CHANGE |
|  |  | Yes No |
|  |  | Yes No |
|  |  | Yes No |
|  |  | Yes No |
|  |  | Yes No |
|  |  | Yes No |
|  |  | Yes No |
|  |  | Yes No |
|  |  | Yes No |
|  |  | Yes No |
|  |  | Yes No |
|  |  | Yes No |

Appendix I: Sample of the Baseline Change Request form.

ORIGINATOR OF REQUEST: DATE:

SOURCE OF THE PROBLEM REQUIRING THE CHANGE:

|  |  |
| --- | --- |
|  | SRS Baseline document |
|  | Design Specification as Implemented |
|  | Implementation |
|  | Database |
|  | Other |

DESCRIPTION OF REQUESTED CHANGE:

|  |  |  |
| --- | --- | --- |
| CHANGE  REQUIRED: |  | SPECIFY ITEM: |
|  | GUI |  |
|  | Software |  |
|  | Database |  |
|  | Document |  |

DESCRIPTION OF CHANGE:

*Include identification of the affected software component, document, or database change – or a combination of these. If the software change and/or a database change approved, attach the specification for the change. Most changes will also require a baseline document update. If this is the case, attach the change, identifying the document, section number, and the wording to be changed or added.*

IMPACT ANALYSIS:

*Describe the work required to implement the change and estimate the effect of the work on the project schedule.*

DISPOSITION OF CHANGE REQUEST:

|  |  |  |
| --- | --- | --- |
|  | Approved. | |
|  | Not approved. (*Explain*) | | | | |
| AUTHORIZIONS: | | SIGNATURES: | | DATE: |
| Sponsor | |  | |  |
| Project Faculty Adviser | |  | |  |
| Team – Project Manager | |  | |  | |