1. INTRODUCTION

This is the software system proposal document for the <name of the project> project sponsored by <name of sponsor>.

This project is being undertaken by the <name of team> 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.

PROJECT SPONSOR (if there is more than one person serving as sponsor, list each sponsor):

- Name
- Title
- Company or Organization name
- Contact information (phone number and Email address)

<NAMESPACE OF TEAM> DEVELOPMENT TEAM

- List of team member names
- Team contact information (phone number and Email address)

The remainder of this section is intended to introduce the reader to the document and to serve as a high level, executive-like summary to the document.

NOTE. Write this section last! In preparing the document, the project team may have a general understanding of the purpose and scope of the document but one that is not sufficient to inform the general reader. In most cases, it is best to leave this section to the very end, or at least reserve final review and revision until a draft of the document has been completed.

1.1. Purpose

This subsection should describe the purpose of this document. Explain why this document is being written and what the reader should expect, in general, to learn.

1.2. Scope

This subsection should describe what specifically is to be covered by the document and what is not. The reader should be informed as to the context of the information being provided in the document.
1.3. Definitions, Acronyms and Abbreviations

This subsection serves as a glossary for the document. All technical terms used as well as all acronyms and abbreviations used should be arranged in alphabetical order. The purpose of this subsection is to provide the reader with quick access to the definitions of technical descriptors used throughout the document.

For example:

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.

Milestone. A scheduled event used to measure progress.

Project Deliverable. A work product that is delivered to the project sponsor.

Task. The smallest unit of work subject to management accountability.

1.4. References

This subsection serves the same purpose as a bibliography. If any documents were used in the preparation of the document, the formal bibliographic information should be specified here. A reference to a specific bibliographic entry should be made at the location in the document where information from that specific source is used.

For example:


1.5. Overview of Contents of Document

This subsection briefly describes each of the remaining sections in the document as well as the contents of each appendix. The words used can be identical to those used to introduce each of the sections and each appendix.

2. PROJECT OVERVIEW

This section contains a brief description of the project, the deliverables and the process to be used in managing the project. In addition, an explanation is provided as to how the team intends to manage the project. For example, what and how changes will be made.
2.1. Project Summary

This subsection should contain an overview of the project, indicating the phases of work that will take place and when this work will be scheduled into the various phases of the software development. The purpose is to explain how and where the work and the project’s various products fit into the development life cycle.

2.2. Project Deliverables

In this subsection, list all the items to be delivered to the sponsor. The items would include, at a minimum, the Project Charter document, the Software Requirements Specification Document and the Software User’s Manual. The copy of the software along with copies of all the software development documentation and the project logs will be included on a CD to be delivered at the time of delivery, the installation and demonstration meeting with the sponsor at the conclusion of CSc 191. Additional items may be identified by the team’s sponsor and/or faculty adviser. If this is the case, include in this section what additional items would be considered as deliverables.

2.3. The Management Plan and the Planning Process

This subsection should specify how this baseline plan will be used and how it will be updated over the course of the project. From day one, a regular and consistent review of progress should be done on a weekly basis. At the start of CSc 190, the work is concentrated on establishing a working relationship with the sponsor, developing the team’s management plan and the process to be used for weekly reviews and updates of the work required.

This initial management plan contains estimates for start and finish of each phase of work. This applies to the preparation of the Project Charter through to the final delivery and installation of the software. The start and end times for each phase are estimates that will be reviewed by the team on a weekly basis and modified if necessary as part of the project team’s ongoing project management process.
3. PROJECT ORGANIZATION

The section includes an explanation of the phases of work that will be scheduled, monitored and managed throughout the project’s development life cycle. Also included is a description of the team’s planned organizational structure for both CSc 190 and CSc 191. Individual team member assignments and responsibilities will be also described.

3.1. Process Model

This subsection should specify the process model to be followed by the team throughout the CSc 190 and CSc 191 development life cycle. An explanation should be provided that identifies the flow of information and work products between the major project phases and the supporting processes. Most senior projects use a form of the process model represented in Figure 1. The activities and supporting processes are represented by the rectangles. The directed line segments represent the flow of information and work products from one activity and supporting process to another. The Management Plan provides for the monitoring and control of the work required in all phases of the project.

NOTE. If a different process model is to be used, the team will need approval from their faculty adviser.

3.2. Organizational Structure and Interfaces

This subsection should discuss the project team’s organizational structure. The project manager should be identified along with a description of the project manager’s roles and responsibilities. The team members should also be identified and their roles clearly identified. In addition, the team’s faculty adviser should be identified along with the role and responsibility assumed by the adviser.

Finally, the administrative and managerial boundaries between the project, the sponsor and the sponsor’s organization should be described.

3.3. Project Responsibilities

This subsection should identify each major phase of work and activities associated with the phase and identify one or more of the individuals whose job it will be to provide the management and oversight necessary for the successful completion of the phase and the approval of its deliverable product. Included should be initial assignments of team “leads” for various phases of work along with a list of responsibilities.

4. PROJECT MANAGEMENT AND CONTROL

This subsection should include answers to the following:

- How will the plan be kept current?
- How will the project be managed?
- How will progress be measured?
- How will schedules be monitored and adjusted as needed?
- What specific methodology will be used for software development and why?
- How will verification and validation be conducted?

Indicate in this subsection how the project team intends 1) to validate that the requirements satisfy the sponsor’s need, and 2) to verify that the product designed conforms to the requirement specifications. Samples of any forms to be used by the team should be referenced in the appropriate subsection with copies of the forms provided as appendices. The intentions described above will change over the course of the project and should be well documented.

Also provided in this section the procedure the project team will follow in delivering the software to the sponsor. Describe specifically the plan for delivery, installation and acceptance of the product.

Figure 1. Senior Project Process Model

4.1 Project Management Objectives and Priorities.

This subsection describes the team’s plan; that is, how the team views of their goals, the objectives needed to achieve this goal, and team’s priorities as they relate to the various management activities that must be carried out throughout the development life cycle in order to achieve their goal. The activities will include at least the frequency and mechanisms for reporting project status, the structure and scheduling of meetings, the agendas and minutes of all meetings between team members, the team and the project sponsor, and the team and the faculty project adviser. Included in this section should be a description of the Project Log and its planned use in providing an “audit trail” for all decisions made by the team throughout the project.
4.2 Assumptions, Dependencies, and Constraints

This subsection should clearly specify the assumptions upon which the project is based, the external events the project is dependent upon, and the constraints under which the project will be conducted. Included may be a copy of the assumptions, dependencies and constraints cited in the Project Charter document.

Failure to clearly articulate the assumptions being made by the team can impact their ability to successfully deliver the right software to their sponsor. In addition, if the project's success is dependent upon certain events taking place, these events should be clearly specified. For example, commitments made by the sponsor should be fully explained. Finally, there may be certain constraints that limit the way in which the development is to proceed. Typically, such constraints appear in the form of time constraints or technical constraints, each of which could be imposed on the development team.

4.3. Risk Management

Software development risk is the potential occurrence of an event that would be detrimental to the software development process, its plans and/or its products. Risk management is an organized way

- To identify each potential risk
- To prioritize the risk according to its likelihood of occurrence and its impact on the project
- To identify ways to avoid the risk
- To mitigate its impact by identifying alternatives or corrective actions that will be taken in the event the undesirable event does occur

Risk management is necessary throughout the project. Currently identified risks may become less likely, while new risks may emerge and need to be managed. Consequently, the team’s list of risks should change throughout the project.

In addition to the describing the risk management process that the team will implement, the team should also include a list of immediate, relatively high priority risks facing the team and their project. The description should include the nature of each risk, the impact on the project if the risk event would occur, what the team plans to do in order to prevent the risk event from occurring, and what the team intends to do if the risk does occur.

4.4. Change Management

Changes will be required throughout the development. Changes to requirements, design, testing and schedules are unavoidable. The project must have a formal means for identifying each change request, determining the impact of the change and deciding on how to respond. In this subsection identify how the team will manage and control such changes as well as the role of the team, the sponsor and the team’s faculty advisor in recommending and approving changes. For changes that apply to already approved baseline specifications, reference should be made to the manner in which these changes will be documented and accounted for in the Project Log.
This section should reference the Project Charter which should contain the agreed upon negotiation process that will be required to deal with changes requested by the project sponsor.

4.5. Schedule Control

This subsection should explain how the team intends to monitor progress against the baseline schedule. As the project nears completion, estimates become more accurate. For that matter, as the team works through the development life cycle, estimates should also improve as the team becomes more comfortable and efficient in their working together.

This monitoring and updating of the project’s schedule and projected work plan is essential. Each phase of the project is made up of a number of tasks. Some of these can be worked on and completed concurrently, while others may need to be scheduled in a specified sequence. In order to monitor the work, each of these tasks should be clearly specified and assigned to one or more project members. The task must also produce a tangible product. The plan must contain an estimate of the time needed to complete each phase and its associated product. Then, monitoring involves checking progress against the schedule, where progress is associated with producing the tangible product associated with each phase.

NOTE. The baseline schedule is the initial estimate (guess) at how the major phases of work will be accomplished over the life of the project. Changes occur as the team modifies the work schedule to be consistent with the expected progress.

4.6. Issue Resolution

During the course of the project many issues will arise. Each must be addressed in a timely manner to ensure that development can proceed. A plan for resolving these issues should be described in this subsection. Issues may arise in the course of a meeting with the team’s sponsor or during the Technical Review of one of the deliverables. Typically, the particular issue cannot be immediately answered. A form to record the issue should be devised and the manner in which the form is used to resolve the issue should be specified (with a reference to a copy included as an appendix).
5. TECHNICAL PROCESS

This section includes a description of the methods the team will use in representing the technical details that will need to be recorded and published during project development. In addition, the team’s documentation plan is described along with a list of all documents to be produced over the development life cycle. **In addition, this section should describe how documents will be collaboratively modified and the version control process that will be used. In addition, this section should describe coding standards that will be used and the manner in which technical work will be reviewed and approved.**

5.1 Methods, Tools, and Techniques

Typical senior project uses the UML model and the set of diagrams* to represent various aspects of the software system to be developed. For example, the requirement specifications are represented with a set of Use Cases and their associated specifications. In addition, the informational requirements of the system are represented with an information model depicted as an Entity Relationship Diagram (ERD).

If the team has identified and plans to use specific methods, tools and techniques, they should be described in this section. This would include development methodologies, programming languages and other notations, and whatever tools and techniques will be used to specify, design, build, test, integrate, document and deliver the project’s work products.


5.2 Software Documentation

Documentation is an essential communication medium to be used during the software development process. For most of the development time is will be the only manifestation of the product that is visible. As such, the development life cycle is, in effect, document driven. Each phase involves the completion of technical work that must then be formally reviewed and published in document form.

This subsection should specify the project team’s documentation plan, that is, the team’s approach to preparing the various documents over the course of the project. For each phase indicate the key milestones necessary prior to the establishing that phase’s baseline document. Milestones might include 1) verification of the technical work, 2) completion of the first draft of the document, 3) review, revision and approval of the draft through formal technical reviews, and 4) submittal of the team’s approved draft to the team’s faculty adviser. The final milestone for the phase would be the approval of the document establishing it as the baseline version. In addition, this section should describe the way in which the team intends to ensure quality assurance through its own internal review and revision process, as referred to above in item 3).

5.3 Documents

This subsection should contain a list of all the documents to be produced over the development life cycle and a brief description of the content and purpose of each. In
addition, the estimated delivery dates should be specific. **Team member “leads” should be assigned along with a description of their responsibilities.** NOTE. Subsection 2.2 refers to only the deliverables that need approval by the project sponsor.

6 ACTIVITIES AND SCHEDULE

This section contains a description of the activities and tasks to be performed in each of the development phases, the resources required to accomplish the work, an estimated (and hypothetical) budget, and the baseline schedule for the project.

6.2 Activities and Tasks

This subsection at the completion of the project would contain the Work Breakdown Structure (WBS) for each phase of the project. Initially, the only WBS that would be included in this section would be that of the phase that produces the requirements specification document. As each subsequent phase is begun, a baseline WBS should be developed by the team and included as a “change” to the Project Management Plan.

For each phase, first list in outline form the phase associated with each of the major deliverables that must be produced. Then the phase can be broken down into a number of activities. Having committed to completion dates for the Software Requirements Specification (the end of CSc 190) and for delivery, installation and acceptance by the sponsor of the product (the end of CSc 191), scheduling these activities should be done from “right to left”. That is, the team should work from the completion date backwards, assigning start and end times for each activity to completed in order to complete that phase of work as scheduled. Each activity should have duration of one week (or at most two weeks). Completion of the activity should be demonstrated by the “delivery” of a tangible product. Team members should be assigned to activities, as appropriate. Preparation, oversight and updating of the WBS should be the focus of each week’s team management meeting.

The team’s staff training plan should also be included in the WBS. The training schedule should include the types of training needed, the team members involved, entry and exit criteria for the training, the training method, and the schedules for the training during the development life cycle.

6.3 Schedule

The subsection should contain the **baseline** schedule of the project’s development phases and the corresponding Gantt chart. The schedule should be identical to that which was provided in the Project Overview Specification document. Once the Project Management Plan has been approved and established as a baseline, this schedule will be used to track progress. Adjustments to the baseline project schedule will be made as required.
6.4 Resource Requirements

This section should be used to specify whatever specific resources might be needed during the course of the project. Included should be an explanation of how budgeted items (those that are not hypothetical estimates) that were provided in the Project Charter document will be provided.


The introduction to this section should indicate what specifically is being agreed to. The approval page should be used to indicate approval of and agreement to the management process to be used over the course of the development life cycle.

The signatories should include each member of the project team and the project team’s faculty adviser. This would include for each the name and responsibility for each of the signatories.