Project Plan

Online E-commerce Music Store
Version 2.0

Submitted in partial fulfillment of the requirements of the degree of Master Software Engineering

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1. Task Breakdown

1.1 Inception Phase

The inception phase is focused on defining the project requirements. The primary documents to be created in this phase include the Vision document, SQA Plan and the project plan.

- **Vision document** will include an overview of the project, its purpose, goals, risks, constraints, and direction. It will also discuss the main product features, quality attributes, and external interfaces. It will also include the critical project requirements and the major use cases will be defined and elaborated in the requirements analysis.

- **The Project plan** developed will describe the work to be accomplished in each phase as well as the inclusion of an estimate of the workload of the project that will establish a schedule for the completion of all project activities.

- **The Software Quality Assurance (SQA) Plan** will describe the required documentation, standards and conventions, test tracking and problem reporting, and tools used during the project. The plan will also identify the set of quality metrics used to assess product reliability. A simple prototype will be built during this phase so as to establish the project feasibility.

   An executable prototype of the user interface will be demonstrated in Presentation I to establish the feasibility of the important elements of the use case requirements. This will be a milestone for the inception phase.

1.2 Elaboration Phase

The elaboration phase concentrate on the architecture design of the system. The complete architectural design will be documented using appropriate UML diagrams. Each component in the architecture will be documented at the interface level. Reuse of commercial or pre-existing components will be documented. Revisions will be made to the initial vision document to provide a complete representation of all requirements, and the project plan based on the feedback from the committee members. A project component will be formally
specified using a published, formal methodology. A test plan will be developed to outline all testing activities and how to report and track those test results. The two technical inspectors will perform an architecture review and provide feedback by submitting a formal report based on their findings.

As a conclusion of this phase, the developer will demonstrate another executable prototype to illustrate more product features and functionality and submit the required documentation for approval by the supervisory committee.

1.3 Production Phase

The production phase is concentrated on the implementation design requirements, deployment and testing of the system. In this phase, the developer will construct the code and ensure that it is well documented. The code will be tested entirely to guarantee that all requirements are met. All test results will be analyzed and documented. A user manual will also be produced by the developer, which will describe how to install, run, and use the tool efficiently.

At the conclusion of this phase, the developer will present the final version of the software product as the final presentation as well as submit all the required documentation. Review and approval of final presentation determines the completion of project.

2. Cost Estimate

The project is currently at the end of the Elaboration Phase. According to the time log, the developer has spent a total of 157 hours to complete phase I and phase II of the project. 47 hours was spent on documentation, 25 hours was spent on prototype design, and 85 hours was spent on coding and research. The prototype for the project has around 800 SLOC and it implements approx 25% of the required features.

From this data, the following metrics can be calculated:

Productivity = 800 SLOC / 85 hours = 9.41 SLOC/hour

Total Estimated SLOC for the entire project = 800 SLOC / 0.25 = 3200 SLOC
The above calculations show that the developer’s productivity was 9.41 SLOC/hour and that there is a total of approx. 3200 SLOC required for the project. So, there will be 2400 SLOC left for development. The following calculation estimates how much time will be required for the rest of the coding development:

\[
\frac{2400\text{ SLOC}}{9.41\text{ SLOC/hour}} = 255\text{ hours (total remaining development time)}
\]
Considering work of 4 hours per day:
\[
\frac{255\text{ hours}}{4\text{ hours/day}} = 63\text{ days}
\]

Additionally, the developer estimates the time required for testing would be 32 hours (8 days), and the required time for the remaining documentation would be 28 hours (7 days). This would make the total time to complete the rest of the project about 78 days. At a high level, the 78 days can be broken down as follows:

- Coding/Debugging – 63 days
- Testing – 8 days
- Documentation – 7 days

3. Architecture Elaboration Plan

The following tasks have to be completed in the elaboration phase, before the second presentation is given.

3.1 Revision of Vision Document

The Vision Document will be revised to provide a complete representation of requirements. These requirements will be ranked according to importance, and a set of “critical” requirements identified. The document revision will be based from the feedback given by the committee members after the first presentation. The corrected version of the document will be submitted to the major professor for approval.

3.2 Revision of the Project Plan
The Project Plan will be revised based on the feedback provided by the committee members after the first presentation. The document will provide an updated estimate on the size, cost and effort required for the project implementation. It will also contain the Implementation plan which will define the activities and actions that must be accomplished during implementation. The plan will include a Work Breakdown Structure, complete with time and costs estimates and completion criteria. The updated version will be submitted to the major professor for approval.

3.3 Formal Requirements Specification

The Object Constraint Language (OCL) and UML-based Specification Environment (USE) will be used to define and verify the formal specification of the product. At least one component of the design will be formally specified using the methodologies mentioned above. As of now, it has been proposed that a part of the object model will be formalized.

3.4 Architecture Design

The complete architectural design will be documented using appropriate diagrams such as class and object diagrams, sequence/collaboration diagrams, statechart/activity diagrams, hierarchy diagrams, etc. Each component in the architecture will be documented at the interface level.

3.5 Test Plan

A plan will be developed for the project to address the required tests to show that the product satisfies the requirements. The plan will include evaluation criteria for all critical use cases and a set of test data deemed adequate for acceptance testing. Specifically, the test plan will identify a set of test cases, the types of tests that will be used for these test cases, the data that will be used for each case, and the requirement traces for each test case.
3.6 Formal Technical Inspection

The above artifacts will be subjected to a formal technical inspection by two independent MSE students, Rahul Deshmukh and Srunokshi Neelkantan. A formal checklist to be used by the inspectors will be prepared. Each independent inspector will provide a report on the result of their inspection and these reports will become part of the project documentation.

3.7 Architecture Prototype

Prior to the Presentation II, an executable architecture prototype will be built that will address all critical requirements identified in the vision document.

4. Implementation Plan

4.1. Deliverables

The following are the deliverables for Presentation III:

Source Code

Well-documented source code will be submitted. This code will correspond directly to the architecture and component design.

Assessment Evaluation

Test cases that were identified in the Test Plan will be executed. Defect fixing will be done for all resolvable issues. All test results will be documented. The documentation will include a document detailing the testing done on the project along with the descriptions of the testing and known unresolved defects.

User Manual

The user manual will include an installation guide and a user guide. The installation guide will include detailed information on how to set up the software, while the user guide will give detailed explanations of common usage and user commands.

Component Design
The internal design of each component will be documented. UML diagrams will be used for the said design.

**Project Evaluation**

The entire software process starting from the first phase will be reviewed. This will include the usefulness of the methodologies used, the accuracy of the estimations, and the usefulness of the reviews. The tool will be reviewed and evaluated to check whether it accomplishes the goals presented in the vision document and if the quality of the product is achieved.

**Formal Technical Inspection Letters**

The two MSE students will perform the technical inspection of the architecture design. They will submit a formal letter stating that the project has successfully passed all technical requirements.

**References**

The annotated bibliography will include cited references for all notations used in the portfolio.

### 4.2. Work Breakdown Structure

The following table breaks down the deliverables into tasks and lists the completion criteria and cost for each task.

<table>
<thead>
<tr>
<th>Deliverable</th>
<th>Tasks</th>
<th>Completion Criterion</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Source Code</td>
<td>Develop Customer’s functions</td>
<td>Executable code</td>
<td>15 days</td>
</tr>
<tr>
<td></td>
<td>Develop Administrators’s functions</td>
<td>Executable code</td>
<td>11 days</td>
</tr>
<tr>
<td>Assessment Evaluation and Testing</td>
<td>Run test cases and fix resolvable issues</td>
<td>All test cases complete</td>
<td>4 days</td>
</tr>
<tr>
<td></td>
<td>Document test results</td>
<td>All the test case results evaluated and documented</td>
<td>2 days</td>
</tr>
<tr>
<td>Component Design</td>
<td>Installation Guide</td>
<td>User Guide</td>
<td>Approved by Major Professor</td>
</tr>
<tr>
<td>------------------</td>
<td>---------------------</td>
<td>------------</td>
<td>----------------------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Design</td>
<td>Document Online Music CD Store Design</td>
<td>All major features of the Online Music CD Store are documented with UML</td>
<td>Approved by Major Professor</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Project Evaluation</td>
<td>Document usefulness of project, methodologies, practices, and reviews</td>
<td>Approved by Major Professor</td>
<td>2 days</td>
</tr>
<tr>
<td></td>
<td>Compile all project resources together</td>
<td>Approved by Major Professor</td>
<td>2 days</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Formal Technical Inspection Letters</td>
<td>Receive letters from formal technical inspectors</td>
<td>Approved by Major Professor</td>
<td>1 day</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>References</td>
<td>All references documented</td>
<td>Approved by Major Professor</td>
<td>1 day</td>
</tr>
</tbody>
</table>