Deliverable I: Project Proposal (High-level Description)

San José State University

Charles W. Davidson College of Engineering

CMPE 131 Software Engineering I

Instructor: Professor Badari Eswar

Section 01, Team 14

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Sunday, February 12th, 2017

Introduction:

Team 14 is placing its bid for the Spartan Course Analysis & Matching (SCAM) project. Our balanced collection of engineering professionals possess the structural and organizational discipline and technical proficiency to complete this project in a timely and cost effective manner.

The team is undertaking this project in response to an important issue faced by students at San Jose State University. Students and faculty agree that students are more successful in their courses when they are connected to and are able to collaborate with their peers. Collaboration often involves engaging with students who have either taken similar classes, are currently taking those classes, or plan to take them in the future. This project is designed to address this issue.

Currently, this problem is being handled through various platforms. The purpose of this project is to solve the problem using a unified system. There are several sites and applications that solve aspects of the problem. For instance, students can currently visit sites such as Rate My Professor to discover information about their potential professors' teaching styles. They can also connect through social media sites like Facebook to buy and sell textbooks as well as form study groups. While these are functional methods of addressing the issue, they are also largely inefficient because they require students to shuffle between different domains. It would be more effective however, to have everything in one location.

Team:

- Alex Richards: Alex is a 3rd year Software Engineering major focusing on machine learning and data mining. His SCAM speciality is the design and test-driven development of requirement specifications. Apart from the SCAM development team, Alex is employed in SJSU's Computer Science Department as an Instructor Student Assistant (ISA) for *CS 166: Information Security* and in the Computer Engineering Department as a research software engineer for Dr. Anastasiu's Data Mining Lab.
- Joel Birchard: Joel is a 4th year Industrial and Systems Engineering major at San Jose State University. His role on The SCAM development team specializes in the systems and processes on the Company and focusing on elimination of waste of time, money, and man-worked hours. Aside from the SCAM development team he is employed at Santa Clara Valley Medical Hospital as a quality and safety intern.
- Junia Ikeh: Junia is a 2nd year Software Engineering major at San Jose State University. Her role in the SCAM development is to ensure that all system requirements are met, a focus on quality is maintained, and customers are satisfied with the end product.
- Erwin Uppal: Erwin is a 4th year Computer Engineering major at San Jose State University. His role on the SCAM development team is to manage user and project data, and to confirm the security of entered data. Outside of development on the SCAM project, Erwin is employed as a data analysis intern at KIXEYE Incorporated, headquartered in San Francisco.

High Level Requirements:

1) Connect enrolled San Jose State University students by their previous, current, and prospective courses.

    1.1) Provide a view for student's current classes.

        1.1.1) Rank current students by similarity of current courses.

        1.1.2) Display separately the students who have completed these courses.

    1.2) Provide a view for student's prospective classes.

        1.2.1) Rank students by similarity of prospective courses.

        1.2.2) Display separately the students who have completed these courses.

    1.3) Provide messaging system to be used for each of the views.

2) Generate information reports.

    2.1) The number of connected students.

    2.2) The courses that connect these students.

    2.3) The previous users of the system.

    2.4) How many proposed schedules result in actual schedules.

3) Enable connected students to share information.

    3.1) Post review for courses (as opposed to by professor).

    3.2) Provide feedback on professors teaching the classes.

    3.3) Seek and offer tutoring.

    3.4) Set up study sessions.

Proposed Solution:

The team will first establish an object-oriented design that models the problem domain. After this, we'll create a database schema for a SQL DBMS that captures the persistent data the SCAM system will utilize. Next our team will design a user-interface for the SCAM system that will manifest as a web application. The team will implement these fully designed components using the typical front-end webstack (HTML, CSS, Javascript) as well as Node.js for the server and database.

Cost Estimation:

- Labor Expenses:
    - Bay Area average for Software Engineers -- $110k

$$\frac{\$110,000}{52\ weeks} = \frac{\$2,115}{week}$$
$$\$2,115 \times 15\ weeks = \$31,725\ per\ person$$
$$\$31,725 \times 4 = \$126,900$$

- Space:
    - Silicon Valley rental cost per square foot -- $3
        - $\$3 \times 600\ ft^2 = \$1,800$
    - Utilities
        - Water: ~$30
        - Gas/electric: ~$50
        - Internet: $50

$$\$1,800 + \$30 + \$50 + \$50 = \$1,930\ per\ month$$
$$\$1,930 \times 4\ months = \$7,720$$

- Web Hosting:

  $\$200\ per\ month$

- Total Cost:

  $\$126,900 + \$7,720 = \$134,620$ Possible $200 per month extra for hosting

Time Estimation:

Date	**Tasks to be completed**
Sunday, February 12th, 2017	● Define and outline high-level requirements. ● Propose a solution. ● Determine cost estimation.
Sunday, February 26th, 2017	● Refine requirements listed in Request for Proposal. ● Create detailed requirements specification document. ● Design Traceability Matrix to trace requirements to user stories.
Sunday, March 26th, 2017	● Review and update high-level requirements. ● Create diagrams such as sequence, activity, and class diagrams, among others, to depict system design. ● Update Traceability Matrix.
Saturday, April 18th, 2017	● Formulate detailed test cases that correspond with each requirement. ● Incorporate Requirements, Design, and Testing columns into Traceability Matrix. ● Refine cost estimation and project plan based on factual data gathered through project.
Tuesday, May 16th, 2017	● Polish and complete all aspects of project.