



Scheduling Your Horizons

one student at a time

Project Plan

Version 3.1

April 24, 2017

Revision Signatures

By signing the following, the team member asserts that he/she has read the entire document and has, to the best of his/her knowledge, found the information contained herein to be accurate, relevant, and free of typographical error.

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Revision History

The following is a history of document revisions.

| Version | Changes | Date |
|---------|---|----------|
| 1.0 | Initial Draft | 10/17/16 |
| 1.1 | Milestone/Deliverable Updates | 11/21/16 |
| 2.0 | Milestone, Deliverable, and Other Updates | 2/17/17 |
| 3.0 | Post EYH Event Update | 4/7/17 |
| 3.1 | Minor Updates | 4/24/17 |

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1 Introduction

1.1 Purpose

The purpose of this document is to present an overview of the project, highlight the resources required, set project deliverables and milestones, outline the roles of each team member and assess the risks inherent in the project.

1.2 Overview

The Project Overview (Section 2) gives an overview of the project, the background on the project, and the scope and overall objectives of the project.

The Resource Specification (Section 3) specifies all the software, hardware tools, and contacts that will be used over the course of this project.

The Project Management (Section 4) specifies the deliverables and timeline of the project, the roles of the project members, the monitoring and reporting strategies of the project, and the analysis of project risks.

2 Project Overview

Expanding Your Horizons Network (EYHN) is an organization that was founded to encourage middle school-aged girls to be interested in STEM fields. Every year, chapters of the organization host conferences around the globe in which young girls attend presentations and participate in workshops led by adult, female role models who are working in a STEM field. Currently, there are more than 80 conferences with up to 25,000 girls attending each year. There are conferences in 31 states in the U.S. and in Europe and Asia.

Texas Wesleyan University (TxWes) runs an EYHN conference every year. They previously used a system, created by former Texas Christian University (TCU) students, to track student submissions and generate a schedule for the event. This system is now out of date and can no longer be used. The Scheduling Your Horizons (SYH) team will replace this system while expanding upon the original functionality to allow user registration.

2.1 Scope and Objectives

Primary objectives are to implement two EYHN systems: registration functionality, to be deployed by February 1, 2017 and the scheduling functionality, to be deployed by March 24, 2017. The first deadline allows students to use the application to sign up for the conference. The second deadline allows EYHN volunteers to use the application to create the schedule and generate reports. To achieve this goal, a Linux server will be configured to host the system. This will allow work to commence on our database that will contain details on the students. During this time, different algorithms will be studied to find the algorithm best suited for sorting and creating schedules. Finally, a user interface for student registrations shall be created, along with a set of tools for the administration to use to modify and create new schedules.

2.2 Project Background

As previously mentioned, the EYHN scheduling project started back in 2005 at TCU. The original team created a database and scheduling software that ran on a standalone Windows XP machine. The existing system required manual entry of all registration data obtained from handwritten forms. This task was normally carried out by an intern or volunteer and took a tremendous amount of time. The SYH team will address this problem by creating a web portal that shall allow attendees to register remotely.

Our current project was brought to Dr. Ball by the EYHN committee at Texas Wesleyan University. Texas Wesleyan University could no longer run the old system on campus due to new network security requirements, as the Windows XP operating system is no longer being supported. To continue the use of the old system, Dr. Ball purchased an old Windows XP machine that would run outside the official Texas Wesleyan University network. Our new system shall work within the guidelines for network security at Texas Wesleyan University.

3 Resource Specification

3.1 System Software

3.1.1 Code Development Environments

The software tools used will vary from group member to group member, depending on their roles and responsibilities. These coding tools will assist with simplifying the coding process, but will not affect the final software products.

The IDEs include but are not limited to the following:

- WebStorm (2016.2.3 Build 162.1812)
- DataGrip (2017.1)
- PyCharm (2016.2.3 163.5644.6)
- MySQL Workbench (6.3)

The text editors include but are not limited to the following:

- Emacs (24.5.1)
- Vim (8.0.0022)

3.1.2 Application Software

Below are the technologies that shall be used on the project:

- Django (1.10.4)
 - Python framework for creating web applications
- Apache HTTP Server (2.4.23)
 - A robust, feature-rich, commercial-grade and open source HTTP Server. It will be used to host the service
- MariaDB (5.5.52)
 - The open source branch of MySQL maintained by the developers of the original MySQL. It is the default MySQL database installed on CentOS
- Python (3.6.0)
 - A high-level, general purpose dynamic programming language. Will be used as the main back-end programming language of the project
- Docker (17.03)
 - Container system used for deploying the application
- Bootstrap (3.3.1)
 - An HTML, CSS, and JavaScript framework for rapidly developing responsive websites and web apps
- JavaScript
 - Language used for editing webpages
- HTML5/CSS3

- The standard markup language of the web
- JQuery (1.11.2)
 - A powerful JavaScript library
- ReCAPTCHA
 - User friendly CAPTCHA service

3.1.3 Distributed Version Control / Source Code Management (SCM)

Git will be used as the version control system to manage all source code. The code will be hosted in a private repository on GitHub.

3.2 System Hardware

3.2.1 Linux Server

The Linux server has the following hardware specifications:

CPU

- Model: Intel(R) Xeon(R) CPU, 2.53GHz
- Cache: 8192 KB

Memory

- 2 GB

HDD

- 100 GB

3.3 Customer Contacts

Our primary contacts on this project are Dr. Ball at TCU and Dr. Moore at Texas Wesleyan University. Dr. Ball has worked with the EYHN network for over 20 years. She was also the main point of contact for the previous iteration of this project back in 2005. Dr. Moore is the chair of the Department of Mathematics at Texas Wesleyan University and oversees the EYHN program at Texas Wesleyan University. The SYH team is also in contact with Dr. Yukong Zhang, who is the primary contact for managing the Linux server and related resources.

4 Project Management

4.1 Milestones and Deliverables

In addition to the milestones and deliverables listed below, all documentation will be updated for each iteration.

Project Plan V1.0 **October 17, 2016**

The first draft of the Project Plan document will be created and submitted on the Brazos server.

Software Requirements Specification V1.0 **November 4, 2016**

The first draft of the Software Requirements Specification document will be created and submitted on the Brazos server.

Iteration 1 **November 11, 2016**

The first iteration will include the initial prototype user interface, initial database design, and a non-functional skeleton website. Different scheduling algorithms will be explored.

Iteration 2 **December 9, 2016**

The second iteration will include the completed database, front end form submission pages, and cancellation pages. Both the student and volunteer submission backend integration will be completed. The skeleton website will be a functional website hereafter, integrated with backend functions. Randomly generated data shall be used to thoroughly test our submission system at the completion of this iteration.

Design Document V1.0 **December 9, 2016**

The first draft of the Design Document will be created and submitted on the Brazos server.

Production Deployment of Signup Forms **January 29, 2017**

The signup portion of the application, where participants in the conference can sign up via our online forms, will be complete and deployed to the final production server. The test suites will be run against it in production mode to ensure correct production setup.

Iteration 3 **February 1, 2017**

The system will be tested in the production environment starting January 29th. Then, on February 1st, Texas Wesleyan University will add links to the signup forms on their website, directing participants to the signup forms. Iteration 3 consists of all registration functionality, including forms for every participant, as well as the student cancellation page.

Iteration 4 **February 24, 2017**

The fourth iteration will add the framework for the scheduling and report generation piece of the application. This includes full HTML web pages and functional connection to the back end, but not integration with the scheduling algorithm or database. All transitional (links and buttons) functionality shall be covered by integration tests.

Iteration 5**March 24, 2017**

The fifth iteration will include the fully functioning application, including a working scheduling algorithm, properly generated reports, and thorough testing. The final stages of testing shall be completed before delivering the finalized software to Texas Wesleyan University.

Texas Wesleyan University - Expanding Your Horizons Network Event**April 1, 2017**

SYH shall attend the EYHN event at Texas Wesleyan University to support our system.

Student Research Symposium Poster**April 6, 2017**

A poster will be submitted for the Student Research Symposium presentation.

Developer's Guide V1.0**April 13, 2017**

The Developer's Guide document will be created and submitted on the Brazos server.

Iteration 6**April 17, 2017**

The sixth and final iteration will be the finalization of the documentation and implementation of features which will allow the organizers to renew the application every year, finalization of the Administrator functionalities, HTTPS capabilities, and secure access to the Scheduling and Report generation systems. Preparation for upcoming presentations shall also be underway.

Student Research Symposium**April 21, 2017**

Our project will be presented to students and faculty at Texas Christian University's Student Research Symposium.

Final Presentation**May 4, 2017**

SYH shall give its final presentation in front of the computer science faculty, students, and family.

Final Project Submission**May 5, 2017**

Our final project of all documentation and code shall be submitted to Dr. Payne via a DVD.

4.2 Team Member Roles and Responsibilities

In addition to the tasks designated below, each member of the group will be participating in all aspects of the project including but not limited to documentation and development.

Steven Garcia-Renteria

Documentation Lead

Steven oversees maintaining the documentation's consistency, checking for grammatical errors, and tasking team members with document sections to be written, as well as leading the team on web hosting. He will work in conjunction with web design, accompanied by Will Taylor. He will also ensure that everyone is completing their work on documentation.

Rebecca Ruch

Development Lead

Rebecca is responsible for overseeing the development process. She will mostly oversee backend processes but will be working with the frontend as well. She is also the Scrum Master and will maintain a working environment free from distractions during meetings.

Harrison Engel

Technical Lead

Harrison oversees communicating to the team what technical processes need to occur and assigning tasks to team members. He will closely work with Cameron Diou to understand the current requirements or functionality to be implemented in the system.

Cameron Diou

Project Lead

Cameron is responsible for overseeing the entire project. He will be maintaining the communication between our advisers and the team. He will work closely with Harrison Engel to keep the team up to date with changing requirements and functionality.

Will Taylor

Design/UI Lead

Will oversees the design and user interface. He will primarily be working with frontend processes and will create the design for the user interface.

4.3 Monitoring and Reporting Mechanisms

4.3.1 Meetings

The SYH team plans to meet every Monday to discuss progress on this project and to plan how to proceed for the next week. The team will be working directly with Dr. Ball to receive feedback on how to move forward with the project. Additional meeting time will be scheduled if required.

4.3.2 Communication

The SYH team communicates digitally over GroupMe, iMessage and email messages, while sharing dates over a shared Google Calendar.

4.3.3 Requirements Control

As milestones are completed, documentation and requirements will be reviewed and revised. If changes are needed, the Revision History will be reflected on page-ii.

4.3.4 Weekly Activity Reports (WARs)

Weekly Activity Reports will be recorded to track the progress of the project. They will be posted on the project website at <http://brazos.cs.tcu.edu/1617SYH/wars.html>.

4.3.5 Walk-throughs

Walkthroughs will be completed when models and frameworks are created, along with getting previous process-flows from EYHN.

4.4 Risk Management

4.4.1 Risk Identification and Analysis

| ID | Risk | Probability | Effects |
|----|--|-------------|-----------|
| 1 | Network issues with the server cause the web services to be unreachable. | Moderate | Critical |
| 2 | Requirement changes require major design/architectural changes. | Low | Tolerable |
| 3 | Scheduling algorithm contains bugs with unforeseen edge-cases. | Low | Serious |
| 4 | Issues arise in obtaining access to Texas Wesleyan University servers to host product. | Moderate | Serious |
| 5 | Members get sick at key moments in the project's development. | Moderate | Serious |

4.4.2 Risk Planning and Monitoring

| ID | Mitigation Strategy |
|----|---|
| 1 | Create a backup server using an alternate server, hosted by the client. |
| 2 | Code the project modularly with change in mind. |
| 3 | Perform extensive testing on the scheduling algorithm with multiple data sets. |
| 4 | Maintain open communication channels with TxWes staff to ensure that server access is established and maintained. |
| 5 | Each member works on different parts of the project, thus increasing redundancy. |

5 Glossary of Terms

| Acronym | Phrase / Definition |
|-------------------------|--|
| Bootstrap | Front-end web development framework |
| Django | Python framework used to create web apps |
| EYHN | Expanding Your Horizons Network |
| Feature Branch Workflow | All feature development will take place in a dedicated branch instead of the master branch |
| IDE | Integrated Development Environment |
| jQuery | JavaScript library for scripting HTML |
| SCM | Source Code Management |
| STEM | Science, Technology, Engineering and Math |
| SYH | Scheduling Your Horizons |
| TCU | Texas Christian University |
| TxWes | Texas Wesleyan University |