Software Project Plan

Table of Contents

1) Overview

This document contains the <u>Software Project Plan</u> for Notebase application that will be produced spring semester. The schedule for this project starts in February 2022 and ends in June 2022. Students taking SE 4910 and SE 4920 will develop this project. The members of this team are as follows:

- Keremalp Durdabak
- Emre Uzun
- Ataberk Çeliktaş
- Aynur Cemre Aka

Notebase will help students by providing 'extra' handwritten study materials from other students who have taken the course from previous years. This will allow them to study from a plethora of different notes for a specific course.

The project scope for the Notebase will be to include a Mobile and Web based interface, and a backend server that consists of database and AI that will regulate the uploaded materials.

We plan to have a final product complete by June 2022 and will provide functional (without all functions defined) products at regular intervals throughout the semester.

Notebase will be developed using a partially concurrent development cycle. The first iteration will be completed in its entirety, then the development team will split, with two programmers working on the Frontend while other two will configure a server that will host a database and an AI system. If all goes according to the plan (that is, frontend will be finished sooner than the backend), in the third and final iteration, two programmers on the Frontend will also contribute to the backend system where all four programmers will implement the AI and Database.

2) High Level Functionality

Notebase aims to provide extra study materials for students that are taking a specific course, and to create a hub among them. Students from all over the world can share their notes and study materials in order to help each other study from different sources.

Students will register and upload their notes to the system, AI will check the eligibility and authenticity of the notes that will soon-to-be uploaded to the system. The application will have an incentivized uploading system where in order to display other notes, you need to upload your own notes to the platform. The web and mobile will function the same except some minor differences (e.g. Instead of camera scan, an upload area will be implemented for the web).

Notebase will provide a mutual trust system among peers where a student needs to upload a handwritten material, in order to see other study materials (i.e. Quid pro quo). Hence it will encourage students to upload their handwritten notes that they have at their disposal.

This will not only incentivize students to contribute more, but also increases the amount of authentic study materials in the system, thus creating a 'local community' among students where it removes the 'middleman' (i.e. company paywall).

3) Project Staffing

3.1) Assignment Staff
The effort for each part of this project is listed below:

- Project Proposal – Keremalp Durdabak, Ataberk Çeliktaş
- Revised Project Proposal – Emre Uzun
- Project Plan – Keremalp Durdabak, Aynur Cemre Aka
- Requirements Specification – Ataberk Çeliktaş, Aynur Cemre Aka
- Design Document – Emre Uzun, Ataberk Çeliktaş
- Presentation - Team
- Implementation Plan - Team
- Test Plan – Keremalp Durdabak, Ataberk Çeliktaş, Emre Uzun
- Presentation - Team

3.2) Design
The design of Notebase project will consist of 2 parts for mobile and web applications.

3.2.1) Mobile Application Design
The participants in this team will be:

- Emre Uzun
- Ataberk Çeliktaş

3.2.2) Web Application Design
The participants in this team will be:

- Keremalp Durdabak
- Aynur Cemre Aka

3.3) Iteration 1
In iteration 1, we will work on the completion of the fundamental working of the project reserving most of the work on AI modeling and graphical user interface until iteration 2.

3.3.1) AI Modeling Group

The participants in this team will be:

- Aynur Cemre Aka
- Ataberk Çeliktaş

3.3.2) Graphical User Interface Group

The participants in this team will be:

- Keremalp Durdabak
- Emre Uzun

3.4) Iteration 2

Iteration 2 will split the coding between two groups. First team will focus on frontend implementation (for both web and mobile applications), second team will focus on configuring backend (server side) of the project.

3.4.1) Frontend Implementation Group

- Keremalp Durdabak
- Emre Uzun

3.4.2) Backend Group

- Aynur Cemre Aka
- Ataberk Çeliktaş

3.5) Iteration 3

In iteration 3, after the front-end group finishes the web and mobile implementation, both groups will contribute to backend with implementing an AI model and database system in the server.

3.5.1) Database and API Connections Group

- Keremalp Durdabak
- Emre Uzun

3.5.2) AI and Server Configurations Group

- Aynur Cemre Aka
- Ataberk Çeliktaş

3.6) Iteration 4

This iteration will focus on increasing the security of the overall system and cleaning up any interface issues that arise due to testing during iteration 2.

All team members will participate.

3.7) Testers

The participants in this group will be:

- Emre Uzun, for iterations 1, 2, and 3
- Keremalp Durdabak, for iteration 2
- Ataberk Çeliktaş, for iteration 3

4) Software Process

We plan to use an iterative development cycle with four iterations for Notebase project.

The four iterations are listed below:

4.1) Iteration 1

This iteration will be performed by two teams:

- Team 1 – AI Modeling
    - Create and analyze the dataset and create an AI model by using Python and Jupyter Notebook, which regulate the files according to whether if it's handwritten or not.
- Team 2 – Graphical User Interface Group
    - Complete the underlying system architecture before implementing server side and frontend of the system.

4.2) Iteration 2

This iteration will be performed by two teams:

- Team 1 – Frontend Implementation Group
    - Implement the actual mobile and web interfaces and configure soon-to-be used API requests.
- Team 2 – Backend Group
    - Configures the necessary server and database environments that will be fully implemented in the 3rd iteration.

4.3) Iteration 3

- Team 1 – Database and API Connections Group
    - Facilitate API endpoints for front-end to communicate with the database through those endpoints.
- Team 2 – AI and Server Configurations Group
    - Control the incoming file flow and implement an AI system that will regulate the files according to whether if it's handwritten or not.

4.4) Iteration 4

This iteration will focus on increasing the security of the overall system and cleaning up any interface issues that arise during iteration 2 testing.

Testing will be the focus of this iteration; we will perform variety of tests for frontend and backend with the goal of error-free and error-prone codebase in mind.

5) Software Engineering Methods

This section will provide an overview that methods we will use to create this application and how we will perform quality assurance testing.

5.1) Code Reviews

As a team, we will meet every week to control and regulate code reviews.

5.2) Agile Development Methodology

We will follow agile development methodology for this project to minimize the risk and allow implementation in iterations.

5.2.1) Scrum

We will use Scrum Framework to help us naturally adapt to changing conditions and user requirements with re-prioritization built into the process and short release cycles.

5.3) Coding Standard Verification

We will regularly perform code checks to attest that the code satisfies the coding standard and fix any standards violations.

5.4) Object Oriented Design

We will implement the project by using object-oriented design principles for reusability, debugging easier, security, and modeling complex things as repeatable, simple constructs. We will also conduct design reviews during the project to ensure that the existing design will satisfy the project criteria.

6) Schedule and Effort

6.1) Schedule

Please see the attached schedule for the specifications of the schedule. Planned milestone is as follows:

6.1.1) Iteration 1

23 March 2022

6.1.2) Iteration 2

15 April 2022

6.1.3) Iteration 3

30 April 2022

6.1.4) Iteration 4

18 May 2022

7) Measurements

We plan to track the following measurements:

- Categorized Developer time
  - Coding – Time Spent programming
  - Designing – Time spent doing design and re-design
  - Testing – Time spent testing
  - Email – Time spent communicating with the group
- Code metrics
  - Source lines
  - Number of Classes
  - Number of Methods

8) Project Risks

The risks associated with this project are:

- Incomplete understanding of the requirements
    - The requirement for the Notebase system are believed to be well known, but there exists the possibility that the managers of shift employees are performing duties relating to the scheduling that cannot be easily simulated by a computer. In this case, we would need to provide a limited functionality product.
- Misconfiguration of the software tools due to inexperience
    - If the tools that we chose to use are very complex and the setup of the tools results in lost data or lost time due to software issues, that could put us behind schedule to complete the product on time. If the problem were severe enough to warrant a tool change in the middle of development, we could be faced with even more time lost as a result of having to learn how to use a new tool.
- Steep learning curve for the new technologies included with the project
    - Python libraries for AI and backend programming are a new technology for most members of the team. If the API is difficult to learn and interact with, this could lead to time lost trying to get the interaction to work correctly.
- Team inexperienced with AI backend programming
    - Most members of the team have not had extensive experience programming with the Python AI libraries and significant productivity issues may be the result. This issue could become extremely serious if the learning curve for the technology is too steep for the programmers to master in a short time.

9) Software Tools

We plan to use the following tools:

9.1) Tools

9.1.1) VS Code
Text editor for JavaScript, Python, and Front-end Frameworks

9.1.2) XCode
Compiler for IOS

9.1.3) Android Studio
Compiler for Android

9.1.4) SSH
Provides remote access to files for the Linux build system.

9.1.5) React Native Debugger
 Auxiliary tool for React Native

9.1.6) Anaconda Navigator
Temporary codebase and test environment for AI related code.

10) Hardware Support

We plan to make use of the following hardware:

- Linux Server
    - Primary Server
- NginX
    - Web Server
- PostgreSQL
    - Primary Database