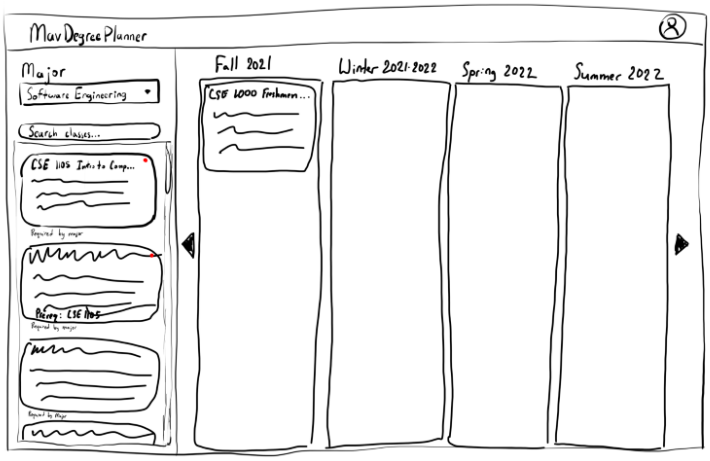
Department of Computer Science & Engineering
The University of Texas at Arlington

System Requirements Specification
CSE 4316: Senior Design I
Fall 2021



Team IDP
MavDegreePlanner

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1 Product Concept

This section describes the purpose, use, and intended user audience for the Interactive Degree Planner. The basic concept of this web-based application is to assist UTA Computer Science and Engineering (CSE) students to create their degree planners that best fit their academic path. The website aims to provide the user-friendly interface taking advantage of drag-and-drop to simplify the degree planning process.

1.1 Purpose and Use

The Interactive Degree Planner website allows UTA students to register and log into the system. The users need to update their degree information before using the application. They are able to select the latest flow charts from the list of supported majors (i.e., Computer Science, Computer Engineering, and Software Engineering); this allows the website to offer the appropriate course catalog of the right major. Each course option in the provided list includes all important information, such as credit value, course title, course number, course description, and etc. Notably, these options are only available for the users as long as they fulfil the pre-/co-requisite and UTA is going to offer the class in the specific semester. The drag-and-drop pattern is implemented in the hope of facilitating the users' experience during the planning process. The users can freely modify their planners as long as no restriction is violated. In addition, the website demonstrates shows the total hours per semester.

1.2 Intended Audience

The intended audience of this web-based application are current and/or future CSE students at the University of Texas at Arlington. Currently, the website are developed based on only three majors in the CSE department. However, all UTA students, who have different majors, are still able to use this website to build their possible-CSE planner as reference information.

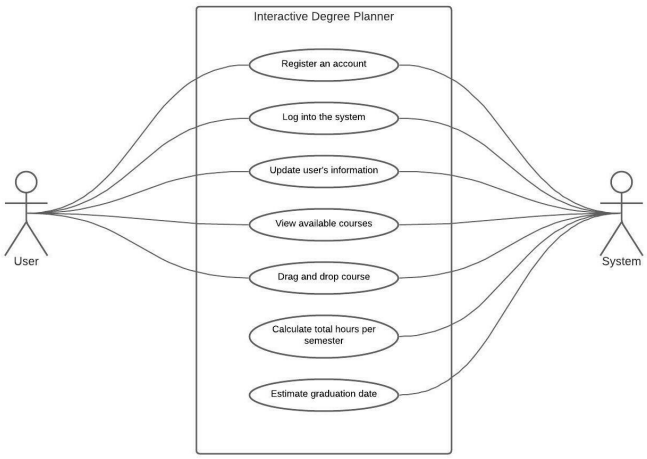

Figure 1: IDP conceptual drawing

2 Product Description

This section provides the reader with an overview of MavDegreePlanner. The primary operational aspects of the product, from the perspective of end users and maintainers are defined here. The key features and functions found in the product, as well as critical user interactions and user interfaces are described in detail.

2.1 Features & Functions

The screen is divided into two parts, the website banner, the side panel and the main screen. The side panel has a button to select a major, a search bar, and the list of classes. The main screen has the list of semesters and which classes the student has selected for each. The website banner has the website logo, title, and a button to go to the accounts page.

Accounts page where users can sign in, sign out, and reset password. Users can create an account so that they can access their degree plan from any device.

In the side panel, show a list of classes which are draggable, and visually show which classes are required by the degree plan. Choosing a major will show which classes are required for the student to take. The classes can also be searched using the search bar above the list.

On the main screen, show a row of semesters which classes can be dragged to. The list of semesters can be horizonally scrolled to show more semesters, and have buttons to scroll for the user. Classes are chosen by dragging and droping classes to the semester box. There will be an error shown to the user if they choosen a class without having the co-reg or pre-req class.

2.2 External Inputs & Outputs

Name	Description	Use
Courses	(External Input) Maintainers will upload the list of classes	List of classes that the user can signup for

Table 2: Overview of external inputs and outputs

2.3 Product Interfaces

Administrators can use the Firebase backend. End-users can access to website with an account, see the image below.

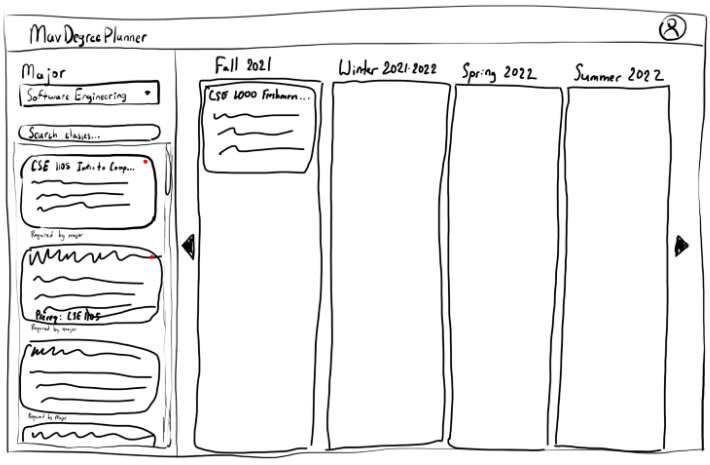

Figure 2: MavDegreePlanner Concept Sketch

3 Customer Requirements

This section will speak about the customer requirements that we will be using to implement the web application. The customer requirements will outline the functions and features that will be encountered by the users. It will give descriptions and details as to how the customer requirements will be fulfilled.

3.1 Registration

3.1.1 Description

Initially, students must register the accounts in order to use the website. Required information includes emails, username, and password. Additional information may be asked, but not mandatory. After the registration succeeds, the students will be able to login to the website.

3.1.2 Source

Team Idea

3.1.3 Constraints

None

3.1.4 Standards

None

3.1.5 Priority

High

3.2 Login

3.2.1 Description

If the users are registered, he/she should be able to login in the system using the authenticated credential.

3.2.2 Source

Team Idea

3.2.3 Constraints

Students must be registered in the system.

3.2.4 Standards

None

3.2.5 Priority

High

3.3 Drag and Drop

3.3.1 Description

The web app will have a GUI which allows users to drag and drop classes into their degree plan. The drag and drop will allow a class to be clicked on and then dragged to the user's intended semester in which they will take the class, and finally dropped if that is the semester they intend to take that specific class.

3.3.2 Source

Team Idea

3.3.3 Constraints

A constraint for drag and drop is when the user drags a class and they let it go, if there is no valid place to drop that class into, then it should return to where it came from. It should drag and drop only to boxes that are intended to be filled. There should be a limit to where the drops can be made. For example, if the user drags a class and drops it in between two semesters, then it should not just drop there. Instead, it should choose the closer box or it should return back to where it came from.

3.3.4 Standards

None

3.3.5 Priority

High

3.4 Semesters

3.4.1 Description

The web app will have sections of semesters. They will allow the users to add classes with the drag and drop feature allowing the user to plan their degree. The user can also take classes away from a semester and move it into another semester or back to the class list.

3.4.2 Source

Team Idea

3.4.3 Constraints

Some constraints for this requirement are that there should only be a certain number of classes within a semester. Uta only permits 20 hours in a normal semester and 9 hours in a summer semester. The semester boxes will have to account for the amount of hours a student adds into it.

3.4.4 Standards

None

3.4.5 Priority

High

3.5 List of Classes

3.5.1 Description

The app will have a list that contains all the classes that the user can select from. It will allow the user to select which classes they want to drag and drop into the desired semester that they choose. The list of classes will be ones that are offered at UTA. There will also be a search bar to make it easier for the user to search through the list and make it more easier to select a specific class that they have in mind.

3.5.2 Source

Team Idea

3.5.3 Constraints

The list of classes will have constraints such as only listing classes that are offered at UTA.

3.5.4 Standards

None

3.5.5 Priority

High

3.6 Accounts

3.6.1 Description

Users will all have their own degree plan. They can choose which classes they want in each semester. To make this happen, there needs to be accounts for the users to separate the data. This will allow the user to save their own unique data and give them access to create their degree plan in the order they choose.

3.6.2 Source

Team Idea

3.6.3 Constraints

The account should be secured and data should not be leaked. Moreover, the users account credentials should be verified to make sure they are part of the UTA system. The user will need to be a UTA student or have valid UTA credentials, which will allow them to access the degree

3.6.4 Standards

None

3.6.5 Priority

Medium

3.7 Majors

3.7.1 Description

The degree planner app must work off the major of the user. If the user has a different major then there should be a different list of classes for the user to drag and drop into semesters. There will be a selection box for the user to select their major and once the major is selected, the user will be able to drag and drop classes from the list that major has in order to complete that degree.

3.7.2 Source

Team Idea

3.7.3 Constraints

Constraints for this requirement are that the user cannot add different classes from different majors. They are not allowed to mix and match. For example, the user can't select a business major and drag and drop classes into their semester if they already have another majors classes in their degree plan. The user is only allowed to select from the classes provided in that major alone.

3.7.4 Standards

None

3.7.5 Priority

High

3.8 Security

3.8.1 Description

The website should provide secure service.

3.8.2 Source

Team Idea

3.8.3 Constraints

The information should be protected properly.

3.8.4 Standards

None

3.8.5 Priority

Medium

4 Packaging Requirements

This section details how the product will be delivered to the end-users.

4.1 Website

4.1.1 Description

End-users can access the website from the given url.

4.1.2 Source

Team

4.1.3 Constraints

The server must be hosted and available to the internet.

4.1.4 Standards

No standards

4.1.5 Priority

High

4.2 Source Code Download

4.2.1 Description

The customer will be given a link to download a ZIP file with the source code. Instructions will also be provided detailing how to deploy it on a server or to view it locally.

4.2.2 Source

Team

4.2.3 Constraints

The ZIP file must be uploaded to the cloud so it can be shared and downloaded.

4.2.4 Standards

The file is provided in ZIP format.

4.2.5 Priority

Low

5 Performance Requirements

The Interactive Degree Planner website is expected to support a large number of users; therefore, it should perform smoothly without any data loss or latency. The main purpose of this interactive planner is to optimize the user experience during the degree planning process, so it is ideal to maximize the performance of web navigation and web interaction.

5.1 Registration and Verification

5.1.1 Description

Assume registration process starts from the moment the user hits the register button (given that information is valid), the website should register the new user in the database within 1 second (given that the normal Internet connection), and no later than 10 seconds. Its login functionality has the same expectation.

5.1.2 Source

Team Idea

5.1.3 Constraints

This requirement is not applicable when the user has a poor Internet connection.

5.1.4 Standards

All user's information must be reliably saved in the database. The verification process for login functionality must at least search for the right key in the database before returning error.

5.1.5 Priority

Medium

5.2 Drag and drop

5.2.1 Description

Assume the Internet connection is normal and given a list of 500 items within a small amount of displacement, the delay for dragging and dropping should not exceed 3 seconds.

5.2.2 Source

Team Idea

5.2.3 Constraints

This requirement is not applicable when the user has a poor Internet connection.

5.2.4 Standards

When the cursor points to a certain item, the website at least highlight the item and start the drag.

5.2.5 Priority

High

6 Safety Requirements

This section will explain the safety requirements for the product which include things both software and hardware if applicable.

6.1 Student Account Protection

6.1.1 Description

As this is a software project that has no hardware units, this is the main safety requirement. This requirement of account safety is important as users will need to be sure that there information regarding what classes they've taken will remain in tact as well as stored safely.

6.1.2 Source

Team Idea

6.1.3 Constraints

Due to creating our own databases and not having access to the UTA Database and student information, we are limited to a basic account security without high level protection.

6.1.4 Standards

No Standards (Software Project)

6.1.5 Priority

High

7 Maintenance & Support Requirements

This section will explain the Maintenance and Support requirements for the product which include things that will be needed to be done and continue doing after the project completion.

7.1 Team Members Support

7.1.1 Description

All team members will be available to answer questions regarding the software application, and if UTA wants to use our application or develop it further, we will provide help from our side as time permits to make that happen.

7.1.2 Source

Team Idea

7.1.3 Constraints

As this app is specifically made for UTA students, only if UTA wants our team help we can provide it.

7.1.4 Standards

No Standards

7.1.5 Priority

Normal

7.2 Source Code Documentation

7.2.1 Description

As the GitHub repository will be provided with the project, all source code is Open Source, therefore having access to the documentation or the code won't be an issue.

7.2.2 Source

Team Idea

7.2.3 Constraints

No constraints as all source code will be available.

7.2.4 Standards

No Standards

7.2.5 Priority

Normal

8 Other Requirements

This section will explain requirements that are classified as "others" which are anything that goes outside of the previously stated requirements.

8.1 Application Guide

8.1.1 Description

This guide will help users navigate through the web application and help the understand what features the app has to provide such that when in need of any help, they can refer to this.

8.1.2 Source

Team Idea

8.1.3 Constraints

Will make this as a pdf document.

8.1.4 Standards

No Standard

8.1.5 Priority

Normal

8.2 Web Browsers

8.2.1 Description

The website is expected to run smoothly on different platforms, i.e., Chrome, Firefox, and etc.

8.2.2 Source

Team Idea

8.2.3 Constraints

N/A

8.2.4 Standards

No Standard

8.2.5 Priority

High

9 Future Items

Currently, the Interactive Degree Planner is solely a web-based application targeting students from Computer Science and Engineering department at the University of Texas at Arlington. Therefore, we are expecting to expand the service in the future, such as providing detail degree planner for majors other than CSE and making an mobile application of this.

9.1 Non-CSE Degree Planner

9.1.1 Description

We hope to make the application available to all departments at UTA, so that all students are able to acknowledge their academic paths in the easier, faster, and more efficient way.

9.1.2 Source

Team Idea

9.1.3 Constraints

We might need the comprehensive instruction from the faculties of different departments to build the most appropriate degree planner.

9.1.4 Standards

N/A

9.1.5 Priority

Medium

9.2 Mobile Application

9.2.1 Description

Due to constraints of time, skills, and feasibility analysis, we decide not to focus on the mobile application for now. However, this is a potential development in the future, which allows users to access to the service easier.

9.2.2 Source

Team Idea

9.2.3 Constraints

Specific skills and tools about mobile application must be acknowledged (i.e., Android Studio for Android application, and/or Swift for iOS).

9.2.4 Standards

N/A

9.2.5 Priority

Medium

References

[1]