Curriculum Mapping Tool

Business Case and Draft Plan for Team 7

1 Business Case

1.1 Executive summary

Efficiency matters significantly to the curriculum leaders in the SET (Sciences, Engineering, and Technology) faculty. The curriculum leaders need to have a general conception of the degrees' structure and the relationship between courses in those degrees. Our project will develop a web application that can visualize the courses in the Computer Science curriculum, identifying the connections, levels, and degrees. We believe that this visualizing application can significantly increase the curriculum leaders' productivity.

1.2 Project motivation

The current method for curriculum leaders to get the information is checking the corresponding website pages. In order to know the details of a degree, they need to switch the pages among Degree Finder[1],Faculty of Sciences, Engineering and Technology, Study Plans[2], and Course Outlines[3]. To check six core courses and six elective courses in a degree, it needs at least 27 times of clicking and leaves more than 20 tabs open. The whole procedure shows the complexity of their routine work. The text-only format of the Course Outlines pages also makes things more challenging. In the pre-requisite and assumed knowledge column, there are only course numbers. Without the course names and the link to the detailed page, the only way to know the course details is to search them in Google. Besides, the school websites sometimes will break down. This unstable character will give the curriculum leaders extra burden and pressure. Therefore, having a simple, straightforward, and stable visualization tool is essential for curriculum leaders.

1.3 Project activities

Our project is a curriculum mapping web application. The curriculum mapping application will visualize curricular information and structure.
The curriculum will generate the IT relative degree and course information from the website of University of Adelaide. Then the curriculum application will sort out the data and store it in a database. After data crawling, our curriculum mapping

application can integrate the data and display the degree structure and relationships between courses with a visualized course map. In the degree detail page, it will present core courses and elective courses in the degree. In the course detail, it will show prerequisite, incompatible courses and other courses in the same degree. Additionally, the search function can provide quick access to the degree or course detail.

1.4 Benefits

- The main benefit of our curriculum mapping application will show a simple and straightforward relationship among courses and degrees. Clients can get the course information quickly.
- The curriculum application is user-friendly, and it will save a lot of time and processing steps for our clients by using our user-friendly application.
- Our curriculum application provides a stable service, whenever our client can get access to our service.
- Our curriculum application is flexible and can be extended to manage courses and degree structure.

1.5 Goals

We have three main goals in this project:

- To build a user-friendly curricular web application by simplifying processes. Client can search by name.
- To display the degree structure and course relationship with visualized graphs.
- To build a stable service by using AWS (Amazon web service) and backup server.

1.6 Future directions

The development of our project takes a semester. We will consider the following if we have more time:

- Design a course management system where a faculty can modify courses and adjust the degree structure.
- Develop a course evaluation system where a curriculum leader can evaluate course quality through students' feedback.
- Expand the target users from more degrees, subject areas, and universities.

2 Draft Plan

2.1 Milestone 1 Plan

Figure 1 shows the schedule and dependency of activities that are essential to achieve the Milestone 1. The definition of Milestone 1, and the description and projected output for each activity are listed in Table 1.

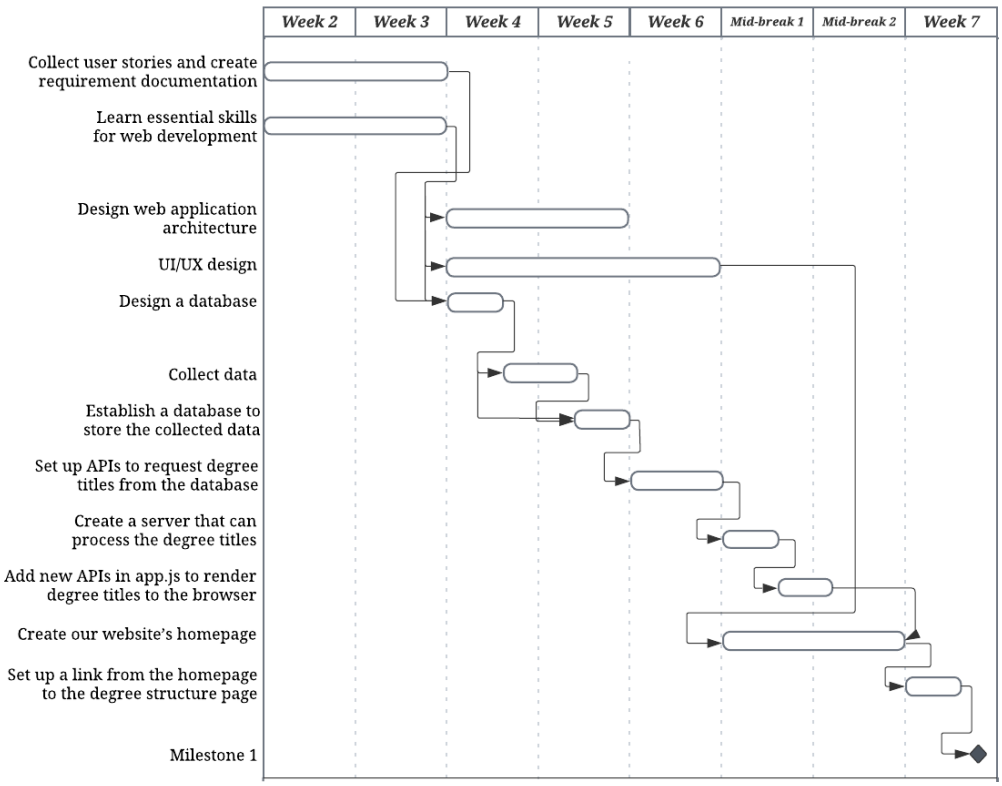

Figure 1. A timetable for milestone 1

2.2 Roles

The size of the team determine we will share the responsibility of Scrum Master and Web developing. Apart from rotating the role of scrum master every two weeks, we adhere to the convention of web-development dividing our team into two sub-team, which are the front-end developing and back-end developing. In addition, more roles are arranged to ensure our project management activities run smoothly.

2.2.1 Project Manager

Ying Liao is responsible for monitoring project progress, ensuring client satisfaction and solving issues that arise. For example, she will collaborate with each scrum master to make sure every sprint aligns with the final goal.

Table 1: Milestone 1 Plan

Milestone 1	**Activities**	**Projected Outputs**
Milestone 1: Complete the website's homepage based on the UI/UX design and link the homepage to the degree structure page. • The homepage will display the titles of the six Computer Science degrees*. • By clicking one of the titles, the browser will be directed to a degree structure page. • The degree structure page can be a blank web page.	Collect user stories and create requirement documentation.	Requirement documentation will be created. It will list the detailed client requirements.
	Learn essential skills for web development.	Each member will obtain essential skills, including HTML, CSS, JavaScript, Node.js, Express, and MySQL.
	Design web application architecture to describe the client layer, the API layer, the application layer, and the database layer, showing their relationships, and how they will interact with each other.	A diagram of software architecture design will be created. The diagram will indicate the major services provided by our website.
	UI/UX design for a homepage, a degree structure page, and a course relationships page^.	UI/UX design for these three web pages will be created. This design will determine the appearance of our website.
	Design a database to specify what data will be required and in what structure they will be stored in the database.	A diagram of database design will be created. The diagram will contain two or more tables and show the relationship between tables.
	Collect data of degree structure and course.	A CSV file will be created. The CSV file will contain information about degree titles, core courses and elective courses of each degree, pre-requisite courses and incompatible courses of each course.
	Establish a database to store the collected data.	A database file will be created by using the data in the CSV file. The database will store the data in a way that is specified in the database design.
	Set up APIs to request degree titles from the database.	An app.js file will be created. The app.js file will contain APIs for getting data from the database.
	Create a server that can process the degree titles, making them suitable for browser use.	A server and some new functions will be created in app.js. These new functions will be able to process data.
	Add new APIs to render degree titles to the browser.	New APIs will be added to app.js file so that app.js can render data to the browser.
	Create our website's homepage in the browser, showing the degree titles as specified by the UI/UX design.	An index.ejs file will be created, serving as the website's homepage. Some CSS files and JavaScript files will be created to realize the UI/UX design of the homepage.
	Set up a link from the homepage to the degree structure page.	When the client clicks a degree title on the homepage, the client will be directed to a degree structure page. Also, a new API will be added in the app.js file, which will render a degree structure page to the browser.

*According to the client requirement, the six Computer Science degrees are: Bachelor of Computer Science, Bachelor of Information Technology, Master of Computer Science, Master of Computing and Innovation, Master of Cyber Security, Master of Artificial Intelligence and Machine Learning.

^A homepage will display the title of each academic degree. A degree structure page will display the core courses and elective courses of each academic degree. A course relationship page will display the pre-requisite courses and incompatible courses of each course.

2.2.2 Product Owner

Yingyu Wei is responsible for managing and prioritizing the product backlog, translating the client's oral requirements to tasks for development, and determining if the quality of project deliverables in this sprint is satisfying.

2.3 Communication Plan

Our communication plans are shown in Table 2. Internally, we stick to the Agile approach to ensure an efficient process. Externally, we have a client meeting biweekly to report our development progress and to get new features for the next sprint.

Table 2: Communication plan

Communicating With	Description	Objective	Medium	Owner
Client	Client Meeting	Report the project status and get user feedback	Teams, Email	Project Manager
Team Member	Sprint Planning	Refine backlog and allocate task	Discord, GitHub	Product Planning
Team Member	Daily Stand-up	Task update	Discord	Scrum Master
Team Member	Iteration Review	Assess definition of done	Discord, GitHub	Scrum Master
Team Member	Retrospective	Continuous improvement	Discord, GitHub	Scrum Master

2.4 Risk Management

As detailed in Table 3, we identify possible risks and prioritize them by their probabilities and effects. Strategy is developed for each risk, which ensures our control over the uncertainties.

Table 3: Risk Management

Risk Type	Possible Risk	Probability	Risk Effect	Strategy
People	Key staff get infected Covid-19 at critical times.	Very high	Serious	Pair developing, if one staff is sick, the other one can cover the job.
Technology	The development environment is different from the production environment, causing bugs.	High	Serious	Use docker container to package up our application with all the libraries and other dependencies we need. Then our application can perfectly run on any other machine.
Estimation	The schedule of the project cannot be met, the milestone timeline needs to be extended.	Moderate	Serious	Create a sense of urgency in our daily routine, so we have some time flexibility left at the end of the milestone.
Organization	Accidentally delete important data when operating the database.	Moderate	Serious	Adopt the technology of Multi-Version Concurrency Control for our MySQL database to make sure that the database can be rolled back after every operation.
Requirements	The client asks for more degrees and majors to visualize.	Moderate	Tolerable	Prioritizing and evaluating the importance of the new functionalities in the application as a whole, considering adding the new requirements to the next iteration as well.

References:

[1] https://www.adelaide.edu.au/degree-finder
[2] https://set.adelaide.edu.au/student-support/study-plans/ecms-study-plans
[3] https://www.adelaide.edu.au/course-outlines/