Project Proposal

261361 - Software Engineering

Curriculum planner

for Computer engineering student

7Gods

Jirapat Promta

Thian Suwannakul

Chonlanan Thongthai

Piyaphat Khaosaeng

Panthaweekan Somngam

Winittra Saengsroy

Jedsadaporn Juntong

Project portal

https://se-curriculum-planner.github.io/portal-static-ts/

Team members

Name	Student Code	Role(s)	Qualifications
Jirapat Promta	620610019	Project Manager & System Analyst	Experienced as team leader, planning and controlling team members and developing software end-to-end.
Thian Suwannakul	620610176	Product Owner	Experienced in web development projects, data & image processing, and visualization.
Chonlanan Thongthai	640610625	Project Manager	Experienced in web application development and have good team collaboration.
Piyaphat Khaosaeng	640610651	Developer	Experienced in web development projects and have a good team.
Panthaweekan Somngam	640612093	Developer	Experience in developing Fullstack Web, with responsibilities including Database and Backend development.
Winittra Saengsroy	640612097	Designer	Experienced in UX/UI design, graphics design, and basic front-end development.
Jedsadaporn Juntong	640612179	Tester	Experienced in front-end development and interested in testing.

Project description

Curriculum Planner for Computer Engineering Students (CPE)" is a web application designed to assist computer engineering students in efficiently organizing their course registrations.

Problem statement

The existing official procedure involves accessing the curriculum plan on the Chiang Mai University Computer Engineering (CPE) website. However, the curriculum is presented in PDF format, which may introduce errors during registration.
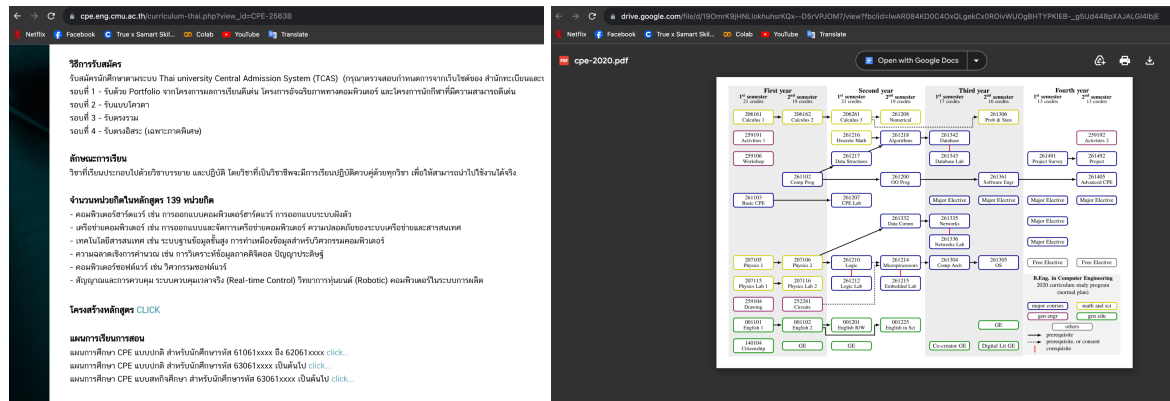
Chiang Mai University Computer Engineering (CPE) website.

(www.cpe.eng.cmu.ac.th)

Some of our team members came up with the idea for this project because they noticed a common issue: "I'm not sure what courses to register for to meet all the credit requirements and graduate this semester." After discussing it further, we realized that many Computer Engineering (CPE) students might face similar or related problems.

After our initial session, we discovered two additional websites for planning registration: the engineering registration website and a planning spreadsheet by Aj. Chinawat. However, those systems have some disadvantages, such as a non-friendly user interface and confusion in General Education types, etc.

We decided to create a survey form and assigned our team members to conduct interviews with computer engineering students, selecting 3-5 students from each academic year (1-4). In addition to these interviews, we collected responses from our survey form, receiving around 40 responses in total.

After we got all the responses we attended a design thinking session to define problems, This is our finalized version of the user's problems

- Confusion in Co-GE, GE (General Elective), and FE(Free Elective) registration process.
- Confusion in Co-GE, GE (General Elective), FE(Free Elective) schedule.
- Not sure which and how many credits are left to achieve.
- The current procedure is not user-friendly (bad UX/UI).
- The current official procedure is not functional.

Solutions

From the problem statement, our team intends to develop a web-based application that addresses the problem statement with these main features and key components included

- **User-friendly interfaces**

  Create user-friendly interfaces and prioritize user experience. Gain a thorough understanding of our users to ensure the website is easily navigable while incorporating all essential core components.

- **Curriculum planner**

  Develop interactive web pages that allow users to easily plan their study schedules. We have planned to utilize an API to retrieve student enrollment data from the registration department (if possible) for displaying and facilitating the planning process. **The primary purpose of this website, as well as the project, is to serve as a curriculum planner.** It will enable users to make selections of their preferred courses (Co-GE, GE, FE) with reduced complexity. Students will no longer need to consult multiple curriculum plan sources to determine their position within the curriculum.

- **Reliability**

  Once this web application is implemented, we are confident that computer engineering students who previously encountered issues with the registration process will feel more assured during each semester's registration. However, we plan to gather feedback once the testing process is completed for evaluation.

There are also many features we want to add to this project, But due to one semester working time, we will take only a curriculum planner as an evaluation feature. These are features we are interested in implementing

- ☐ Scaling

  We hope to make this web app available to a bigger department if it works well for computer engineering students. Dealing with a lot of data and managing things on a larger scale is a big task. That's why, for now, we've chosen to focus on implementing it specifically for the Computer Engineering (CPE) department.

- ☐ GPA calculation

  This feature is present on the engineering registration website and Aj. Chinawat's spreadsheet. We strongly believe that this feature is highly useful, and it would be fantastic if we could include it in our project. However, we also considered that it might be too extensive for a one-semester project.

Contribution

From studying platforms related to course registration, including the grade processing system website for the Faculty of Engineering, CPE/ISNE requirement spreadsheets by Dr. Chinawat Isradisaikul, and study plan files for computer engineering students, it has been observed that the key features include:

1. The grade processing system website for the Faculty of Engineering has a summary of credit units and grades for registered courses and is provided with a clear and easily understandable user interface, encompassing a well-defined breakdown.

2. CPE/ISNE requirement spreadsheets by Dr. Chinawat Isradisaikul can possess the capability to plan a course of study and calculate grades and remaining credit units throughout the entire curriculum.

3. Study plan files for computer engineering students categorize each course clearly, enabling students to accurately choose courses based on categories and providing a well-planned course layout for easy and efficient registration.

The summary indicates that our solution is an innovative contribution, integrating features from various registration platforms, including the user interface for grade display from the grade processing system website for the Faculty of Engineering, the planning and grade calculation capabilities from CPE/ISNE requirement spreadsheets by Dr. Chinnawat Isaradisaikul, and the clear categorization and proportional representation of course information from study plan files for computer engineering students.

Stakeholder

Stakeholder	Involvement	Groups
7Gods	software development, design, and maintenance	software developer
Dr. Chinnawat Isaradisaikul	provide advice and assistance in utilizing data extracted from websites	advisor
Computer Engineering student at Chiang Mai University	website user and an interviewer	end-users
Department of Computer Engineering at Chiang Mai University	provide support for deploying the website through a server	server provider and supporter

Technologies

Frontend

React.js
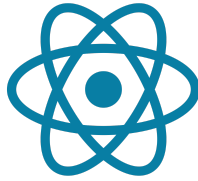
React is the library for web and native user interfaces. Build user interfaces out of individual pieces called components written in JavaScript.

Reason we chose this technology

- React is favored in web development for its adoption of a declarative syntax, component-based architecture, efficient virtual DOM, one-way data binding, JSX utilization, adaptability with React Native, robust community support, extensive ecosystem, and performance optimization features.

Backend

Node.js

Node. js is an open-source, cross-platform JavaScript runtime environment and library for running web applications outside the client's browser.

Reason we chose this technology

- Node.js is chosen for its scalability, single-language usage (JavaScript), efficient and performant event-driven architecture, rich npm ecosystem, strong community support, flexibility across various applications, corporate backing, fast execution via the V8 engine, cross-platform compatibility, and open-source nature.

Express.js

Express.js is a minimal and flexible Node.js web application framework that provides a robust set of features for building web and mobile applications.

Reason we chose this technology

- Developers often choose Express.js for building web applications due to its minimalistic yet powerful framework, which simplifies server-side development in Node.js, offers a range of essential features, and facilitates the creation of scalable and efficient web applications.

Postman

Postman is a popular collaboration platform for API development. It provides a user-friendly interface that allows developers to create, share, test, and document APIs.

Reason we chose this technology

- Postman is widely used for API development due to its intuitive interface, robust testing capabilities, collaborative features, automated testing support, and the ability to streamline the entire API development lifecycle.

Web scraping

Web scraping, the process of extracting data from websites, plays a crucial role in machine learning. By facilitating the acquisition of high-quality data from external sources, web scraping empowers data-driven machine-learning initiatives.

Reason we chose this technology

- Web scraping is utilized to extract valuable data from websites, enabling businesses and researchers to gather insights, monitor competitors, and automate information retrieval processes.

Database

Postgresql
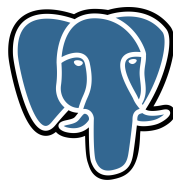
PostgreSQL is a powerful, open-source object-relational database system that uses and extends the SQL language combined with many features that safely store and scale the most complicated data workloads.

Reason we chose this technology

- PostgreSQL is preferred for its reliability, extensibility, ACID compliance, support for diverse data types, scalability, robust security features, and active open-source community, making it a versatile and powerful choice for various applications.

Infrastructure

Docker

Docker is an open platform for developing, shipping and running applications. Docker enables you to separate your applications from your infrastructure so you can deliver software quickly. With Docker, you can manage your infrastructure in the same ways you manage your applications.

Reason we chose this technology

- Docker is favored for its efficient containerization technology, enabling developers to package applications and their dependencies in a consistent, portable, and isolated environment across different systems and platforms.

Nginx

NGINX is a free, open-source, high-performance HTTP server and reverse proxy, as well as an IMAP/POP3 proxy server. NGINX is known for its high performance, stability, rich feature set, simple configuration, and low resource consumption.

Reason we chose this technology

- Nginx is widely chosen for its high-performance, scalable, and efficient web server capabilities, including reverse proxy, load balancing, and robust support for handling concurrent connections, making it an ideal choice for serving web applications and optimizing web infrastructure.

Testing

Cypress

Cypress is a JavaScript end-to-end testing framework commonly used for testing web applications. It provides a comprehensive testing environment that allows developers to write and execute tests directly in the browser.

Reason we chose this technology

- One of the key features of Cypress is its ability to run tests in the browser, allowing developers to debug their tests easily and efficiently.

Third-Party

OAuth

OAuth 2.0 is the industry-standard protocol for authorization. OAuth 2.0 focuses on client developer simplicity while providing specific authorization flows for web applications, desktop applications, mobile phones, and living room devices.

Reason we chose this technology

- OAuth is essential for secure, user-friendly, and standardized authentication and authorization processes, enabling third-party access with limited permissions, reducing the need for sharing sensitive credentials, and facilitating seamless integration across diverse platforms.

Management

Git

Git is a free and open-source distributed version control system designed to handle everything from small to very large projects with speed and efficiency.

Reason we chose this technology

- Git is essential for version control in software development, enabling collaborative work, tracking changes, and facilitating the efficient management of code repositories.

ClickUp

ClickUp is a project management and collaboration platform that offers a comprehensive suite of tools for teams and individuals to manage tasks, projects, and workflows.

Reason we chose this technology

- ClickUp is an all-in-one productivity platform that works as an ideal place for teams to come together, brainstorm, plan, and collaborate on everything from process docs to product designs.

Communication

Discord

Discord is an instant messaging and VoIP social platform that allows communication through voice calls, video calls, text messaging, and media and files. Communication can be private or take place in virtual communities called "servers".

Reason we chose this technology

- Discord is chosen for its versatile and user-friendly platform that seamlessly integrates text, voice, and video communication, making it an ideal choice for collaborative groups.

Conclusion

In conclusion, our project is to implement a curriculum planner web application. Improve and provide convenience for computer engineering student registration planning experience, Reliable curriculum checking, and planning website with updated data (if the API part works as we expected).

- **Problems**
  - Confusions in elective courses registration (Co-GE, GE, FE).
  - Non-user-friendly UX/UI in the current procedure.
  - Registration errors can easily occur by multiple sources of information and untracked processes.
- **Proposed Solutions**
  - User-friendly interfaces.
  - Curriculum planner.
  - Reliable data & planner.
- **Key features**
  - Curriculum planner component.
  - Improve UX/UI for a user-friendly web application.

Appendix

A1 - Responsibilities

Name	Student Code	Responsibilities	Percentage

Jirapat Promta	620610019	- Operations planning and members management - Ask for information from the professor - Technology Searching	15%
Thian Suwannakul	620610176	- Problem thinking - Proposal report	17.5%
Chonlanan Thongthai	640610625	- 4th year CPE students interviewer - Proposal report - **Team meeting appointment** - Brainstorm to solve the problem	25%
Piyaphat Khaosaeng	640610651	- 3rd year CPE students interviewer - Create a survey form - Brainstorm to solve the problem	12.5%
Panthaweekan Somngam	640612093	- 1st year CPE students interviewer - Brainstorm to solve the problem	10%
Winittra Saengsroy	640612097	- 1st year CPE students interviewer - Brainstorm to solve the problem	10%
Jedsadaporn Juntong	640612179	- 2nd year CPE students interviewer - Brainstorm to solve the problem	10%

A2 - Team contribution

- Documentation 15%
- Interview 5%
- Brainstorm to solve the problem 5%
- Operation 5%
- Create a survey form 2.5%
- Problem Thinking 2.5%

Reference

Official CPE/ISNE curriculum website

https://www.cpe.eng.cmu.ac.th/

Aj.Chinawat's spreadsheet

https://docs.google.com/spreadsheets/d/1jHYqcO02O0GYRDJtyvGSQGc_hmyMHYk3e1kt8Jo2K34/edit#gid=864351795

Engineering registration website

https://reg.eng.cmu.ac.th/

แบบสอบถามการลงเรียนวิชาในหลักสูตร CPE

https://forms.gle/ejmfgq5AbjPQZ1Lr8

7Gods's Design thinking

https://miro.com/app/board/uXjVNPPSvSQ=/?share_link_id=175820715149