A New Home: Phase 1

INSO 4101: Introduction to Software Engineering

Informative part

1. Name, Place, Date

A New Home by team Codewalkers, UPR Mayagüez Puerto Rico, Spring Semester 2021

2. Roles

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Pablo G. Sepulveda Cosme - Frontend

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3. Situation

Twice a year, students at the University of Puerto Rico Mayagüez(UPRM) go through the often-frustrating process of enrolling into their classes. In the UPRM system, the enrollment process favors students with good grades, athletes and others by letting them start the enrollment process sooner than all the other students, which leads to many students being left out of the classes they want to take the next semester. Many of these classes are core requirements without which students may not be able to access certain other classes. This problem has been occurring in the UPR for a long time and many students have had their graduations delayed by one or two semesters because of it. We know that something has to be done about this because most private colleges in Puerto Rico don’t suffer from this problem, while all UPR campuses do.

4. Needs

This software design will emphasize mostly UPRM student needs. We will develop the application so students can let their department’s faculty know how many students want to take a specific course during the upcoming semester. Some students may find their desired course by visiting the faculty and waiting in long lines, but some don't. The web application would not only keep students from wasting their time in offices for nothing, but would also allow the faculty to know how many sections to open for a given course, preventing agglomerations of students and long lines in the offices.

5. Idea

To successfully eradicate the problem, we are developing a software that UPRM students can log into with official credentials and, tell the departments' faculties how many students want to take a given course during the next semester before beginning the enrollment process, so they can open as many sections as possible allowing for most if not all of the students to successfully enroll in the course of their choosing. This will let students and faculty work together in order to help each other for the upcoming semester and determine how many sections of each class they should open. During the first parts of the implementation we (the developers) will be creating mock accounts containing data about the students and faculty, hoping that in the future faculty and students may use the web application as it is meant to be used. This software design will be implemented on the Flask(Python) framework with HTML and CSS and the web application will be using SQLite to manage the databases in the backend of the program.

6. Scope, span

The scope of this project is for students to tell the faculty which classes they intend to take during the upcoming semester according to their curriculum. The span is that the faculty will be able to estimate how many sections of any course need to be opened for the enrollment process.

7. Project Organization

For the organization of this project we started by meeting up through the Matrix chat room via voice calls. Since then we have moved on to using our WhatsApp group since it is the easiest way to contact each other at any time and for our meetings, we decided to move to Google Meets because everyone felt it was more convenient since we could share our screens if needed. For phase 1 we had a lot to fix within our project as we felt we had missed the mark on our team proposal. In this phase we thought about what programming languages we wanted to use and came to the conclusion that Python coupled with HTML and CSS would be our best bet given that almost all of the team members are familiar with them due to previous classes. We also made some advancements in the front-end portion of the application by creating a rough sketch of the user interface which was made via Figma, a graphics editor created with team development in mind.

Descriptive part

1. Rough Domain Sketches

The enrollment process in the UPR is a very stressful moment for many students. The reason as to why most students do not enjoy this process is because it prioritizes students with better grades, athletes, and certain other categories of students by allowing them to start their enrollment process days before the rest of the students have their chance. This leads to courses being full before a majority of students even gain access to the enrollment system. There have been many ideas and suggestions to make the enrollment process a better one but, as many people know, the UPR is underfunded, the enrollment system that is being used at the moment is vastly outdated, and there appears to be no intent to change it in the near future.

The enrollment process in UPRM has been the cause of a crisis in the academic life of students for many years. Due to this, many students prefer to enroll in a private university with the hopes of finishing their degrees in a timely fashion. At that point students who are far into their degrees just want it, no matter how they get it. You go to any UPRM department and say “I couldn’t enroll in X course due to lack of space.” or “The system does not let me enroll in X course due to prerequisites.”. So that brings lots of questions, what are they doing wrong? What can they do to improve their system? Is the university prepared each semester for the enrollment process when the date comes? Most of the time the answers to these questions are not what the student wants to hear, and so the university needs feedback from students in order to make sure that they are comfortable with the enrollment process in UPRM.

2. Domain Narrative

Requirements as user stories

As a student of the University of Puerto Rico Mayagüez, I would like to have a way to let my faculty know that I want to take a specific course so that by the time my enrollment process starts I will be able to enroll in it for my next semester. As part of the faculty in a given department within UPRM I should be able to receive the number of students who want to take a given course so that I can open enough sections for all students to have the same opportunity of enrolling in it.

Requirements

As a student user, I should be able to see my curriculum so that I can let my department know what courses I want to take next semester. In addition, the user interface shouldn't be as confusing as the PuTTY client we use to enroll our classes currently, which has been the main way of enrolling our classes for years. As a faculty member in a given department, I should easily be able to see all the classes from my department separated from the other departments and along with it the number of students who intend to take the course during the upcoming semester.

3. Domain Phenomenon

Domain Terminology:

- **UPR** - abbreviation for University of Puerto Rico, a public university system consisting of 11 campuses around the island.
- **UPRM** - abbreviation for the University of Puerto Rico, Mayagüez. A campus of the University of Puerto Rico.
- **Semester** - a half-year term in a school or university, typically lasting between fifteen and eighteen weeks.
- **Student** - a person who is studying at a university or other place of higher education.
- **University faculty** - a division within a university or college comprising one subject area or a group of related subject areas, possibly also delimited by level.
- **Enrollment** - the action of enrolling or being enrolled into a course.
- **Department** - a division of a university or school faculty devoted to a particular academic discipline.
- **Campus** - the grounds and buildings of a university, college, or school.
- **Curriculum** - the classes a student has to take to get their degree.
- **Course** - class that the student enrolls in to take during a specific semester.

Domain Entities:

Atomic:

- **Student** - UPRM student looking to let his department know he/she wants to take a specific course next semester.
- **Department** - a specific department of UPRM who wants to know the exact number of students who want to take a given course.
- **Curriculum** - the classes a student has to take to finish their degree.

Composed:

- **Curriculums** - List of curriculum, each item in the list will be the curriculum of a specified degree.

Domain Events:

A. From a student's perspective:

- See their curriculum
- See what courses would be available the next semester
- Let the faculty know that he/she is interested in an available course
- Communication with university is enhanced

B. From a faculty member's perspective:

- Can see how many students want to take a specific course within their jurisdiction.
- Show the classes that are going to be given during the next semester.

Domain Behavior:

A. Student's behavior:

- Pre-select courses that he/she wants to take next semester
- Pre-schedule a class schedule for the next semester
- Will know beforehand what courses he/she will be able to take for next semester.

B. Faculty member's behavior:

- Open as many sections as possible to accommodate the quantity of students soliciting a course.
- Let students know which classes are going to be available for the next semester.

4. Domain Requirements

A. For students:

- Easily find the curriculum pertaining to his degree
- Quickly be able to notify his department that he wants to take a specific course

B. For faculty members:

- Have a quick way to know how many students want to take a course in the upcoming semester.

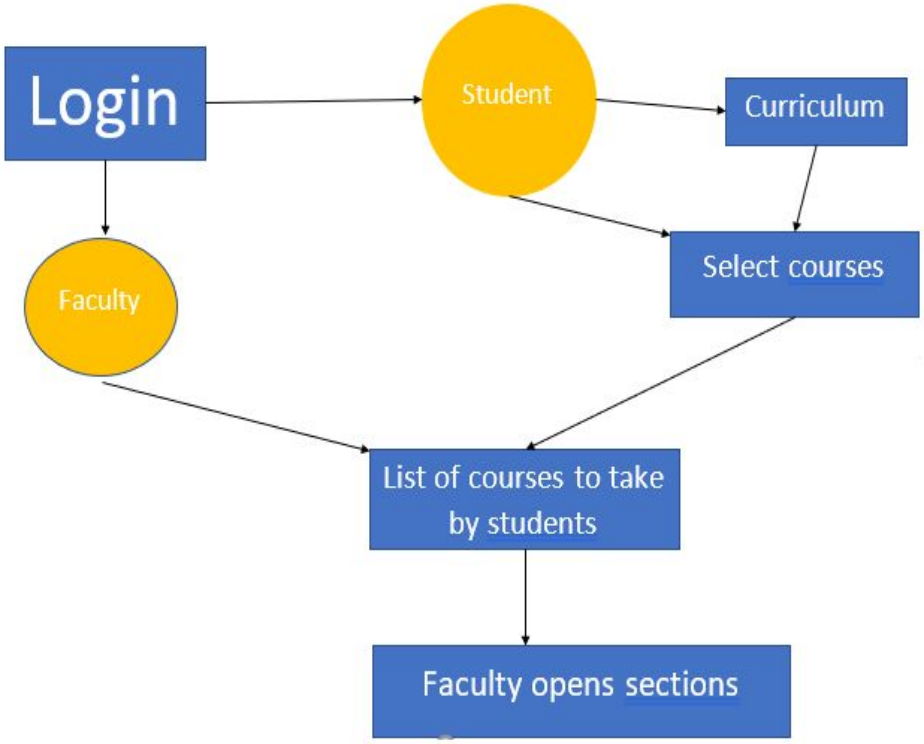
5. Interface requirements

A. Shared Phenomena and Concept Identification

- Student
- Department
- Curriculum

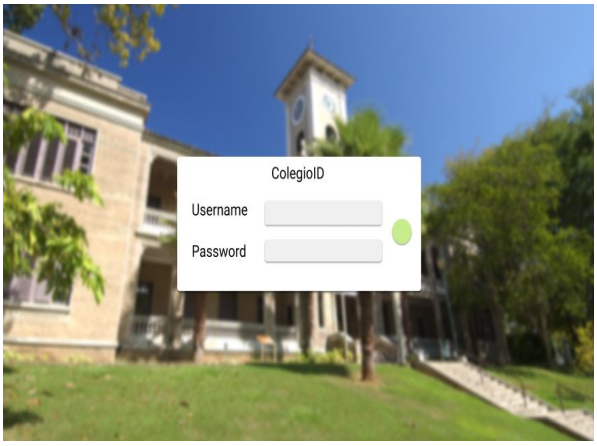
These three phenomena and concepts are the most important part of our domain and will be included in our machine. In our web application the students and department will be our users. Students will use their college emails to create an account in order to be able to let their department know what courses they want to enroll in. Student users will have different privileges when compared to the faculty users.

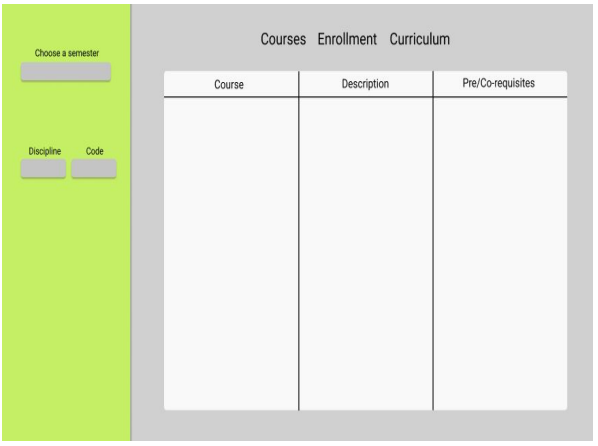
B. Rough Sketch of the Interface



- The login page will receive institutional credentials and detect if the user is a faculty member or a student.
- If a student, it will have access to their curriculum and also allow them to select the courses they want to take next semester.
- If faculty, the user will have access to the list of courses and how many students want to take it, in order to open as many sections as they can for the students to enroll.

6. Rough Sketch for the User Interface





Analytical part

1. Concept analysis:

- The web application will provide the user with information crucial for the upcoming semester.
    - For the student, it will give them as users the best way to plan their class schedule regardless of their date of enrollment.
    - On the faculty side, it would give each department less problems with how many students will have issues enrolling classes.
- The web application will provide options for students at the moment to choose courses for next semester.
    - The student will be able to choose beforehand courses that they need to take according to their curriculum.
- The faculty will have the authorization to see how many students want to take a specific course.
    - This will help the faculty decide how many sections of an established course they are going to open for students to enroll into their classes without problem.
- The web application will work with institutional credentials
    - Using institutional credentials will make the use of the software safer because only people that have access to the institutional services will be able to use it.

2. Validation

The validation process for this project will be carried out by the stakeholders which consist of the following:

- Marko Schutz(Professor) - The professor will be reviewing each phase of the project and will be giving feedback for us to improve the project.
- Developers - Each member of the team will give feedback throughout the development process on what they think must be improved.
- Users - We will have a link to our github repository in our “Contact Us” page so users can give us feedback on any issues or recommendations that they have.

3. Verification

Checking/Testing

- Before commiting a newly implemented task, the code will be put through various debugging techniques to make sure the program runs as expected. Also, each member of the team will review the newly implemented code to check if there are parts of the code that can be optimized.
- We will also make use of the feedback given by the users to ensure that the web application runs smoothly.