SW Engineering CSC648/848 Fall 2022

Project Name: New SFSU Student Center

Team Number: 05

Milestone 1

Date: 9 September 2022

Student Name	Roles	Email
Zhenyu Lin	Team Lead, GitHub Master	zlin4@mail.sfsu.edu
Christopher Alan Yee	Backend Lead	cyee12@mail.sfsu.edu
Michael Harrison Chang	Frontend Lead	mchang9@mail.sfsu.edu
Elisa Hsiao-Rou Chih	Team Member	echih@mail.sfsu.edu
Steven Paul Fong	Team Member	sfong10@mail.sfsu.edu
Cameron Michael Yee	Team Member	cyee10@mail.sfsu.edu

Milestone/Version	Date
M1V1	09/21/2022
M1V2	10/20/2022

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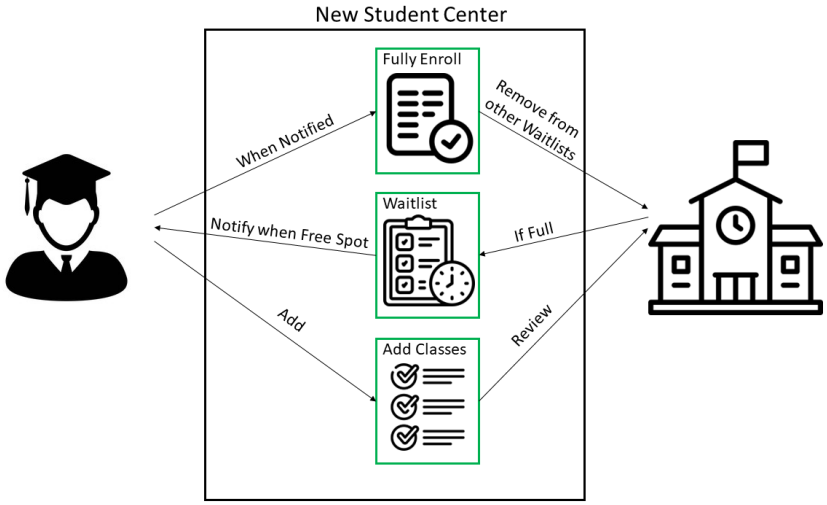
Project Description

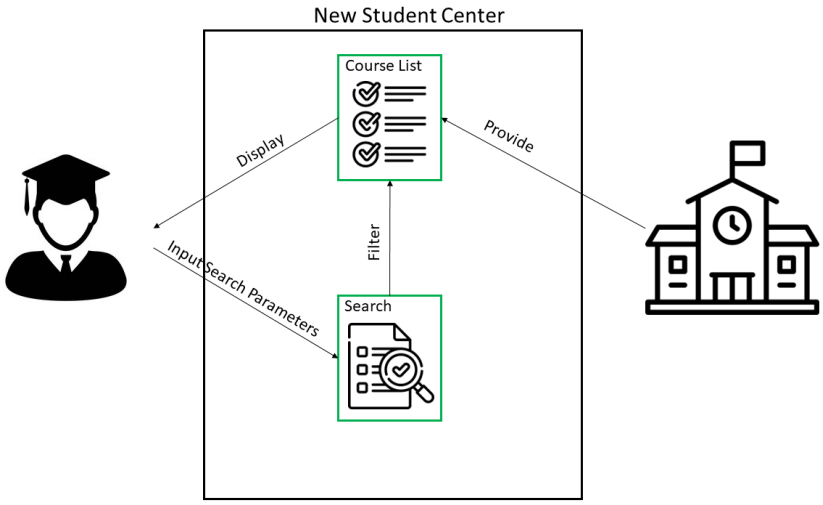
More and more students are enrolling in colleges, and most of them are the first college students in their families. A highly integrated website of college resources is necessary to guide freshmen year students quickly adapt to college life. Many colleges have a website called student center to help freshmen. However, they are not a highly integrated website. The SFSU student center doesn't integrate with the campus clinic. The UCSC student center has 2 types of login systems, one is for basic management of the school such as enrolling in classes, and the other one is for advanced management such as paying for tuition. Many of the student centers had poor user experience due to security reasons and ancient design. This project proposes a modem student center, it integrates a professor ranking system to allow students to choose the best professor for their class. In addition, our student center integrates club resources for non-local students to quickly assimilate into a new community. The survey shows more than 50% of SFSU students want a new highly integrated student center.

Use Cases

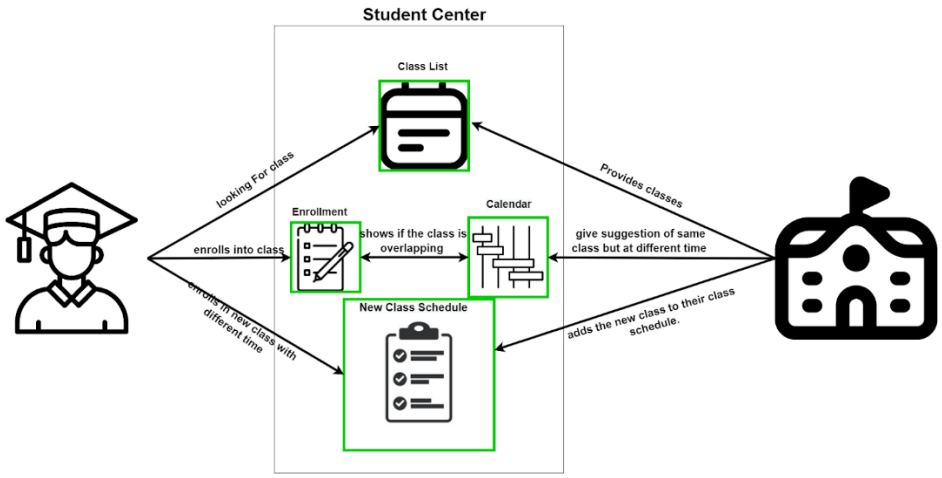
Use Case 1

Title	Adding Classes and WaitLists
Actor	Joe (student), CSM (college)
Description	Joe is a student at the College of San Mateo who wants to sign up for ECON 110-3, but the section is full. Because there are no seats available, the system sends Steve to a waitlist. Realizing that he might not get enrolled in the class, Steve adds sections 1 and 2 of ECON 110 as well, hoping to raise his chances of getting into the class. He is anxious because this is his first time using this kind of enrollment system with waitlisting and add-codes. He is unsure if enrolling in multiple sections is technically allowed, or if a bug in the system is allowing him to do so, and he is afraid of getting into trouble. This confusion is amplified by the fact that section 3 has a time conflict with his MATH 220 class, which he intends to drop if he successfully gets into ECON 110-3. The system reassures Joe that if a spot opens up before the first session of class, he will be notified and will be able to enroll at that time. The system also informs him that even though he is allowed to be on the waitlist of multiple sections of the same class, when he does officially enroll in one of them, he will automatically be dropped from the others, as well as any other classes he is enrolled in which would present a time conflict, such as his MATH 220 class.
Diagram	

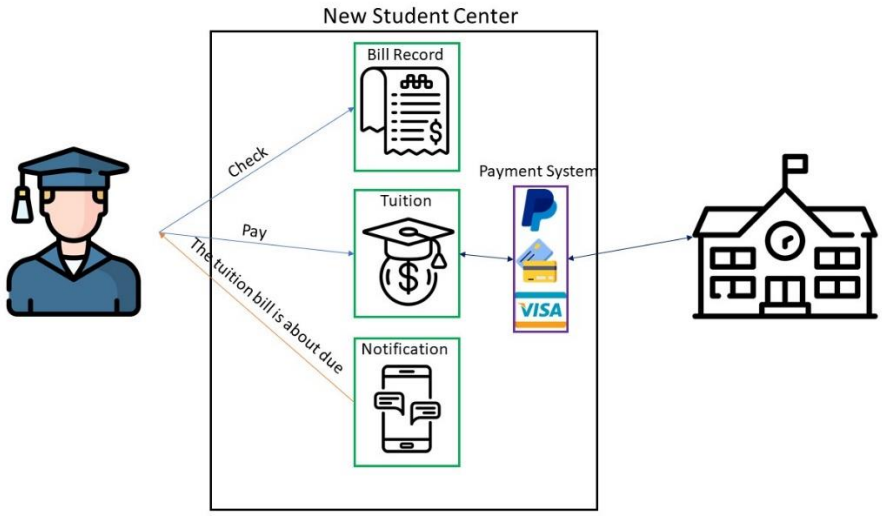
Use Case 2

Title	Searching for Classes
Actor	Erica (student), SFSU (college), Skyline (college)
Description	Erica is a prospective student, browsing SFSU's course catalog online. She is transferring from Skyline, the local community college, and wants to ensure that her transferred courses are valid as prerequisites. She also wants to ensure that all her classes will be online and that the professors will be good as well. Erica is initially intimidated because when she looks at the class bulletin, she is faced with information overload, and making a decision from so many choices is daunting. She frequently searches for the specific class that she needs, and then hand writes down each class's information so she can compare them. Since SFSU has received her transcripts, she can use the system to filter her search to only show classes that she's eligible to take. She can also use the search filters to specify other attributes that she wants, so she can find classes that suit her needs and fulfill her degree's requirements. This way she can compare the classes' information directly on screen, without having to search each one individually and remember the information separately.
Diagram	

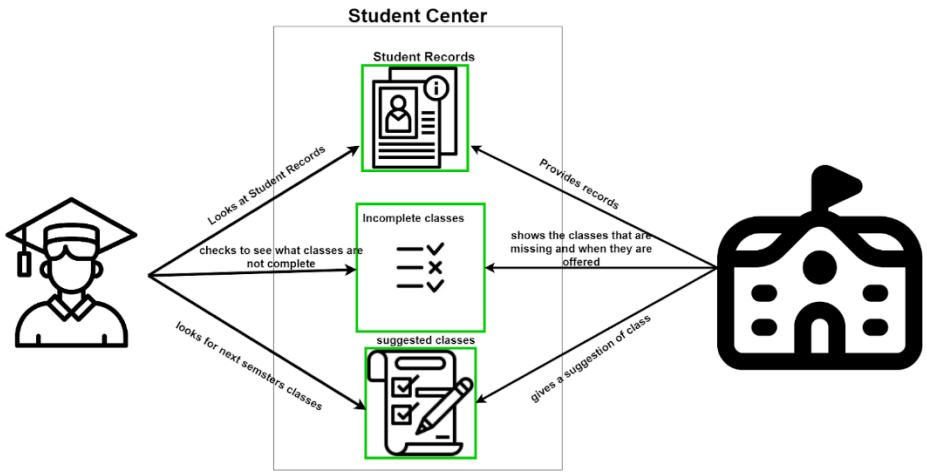
Use Case 3

Title	Scheduling Classes
Actor	Liam (Studnet), San Francisco state university (college)
Description	Liam is an incoming transfer student new to San Francisco State University. He is working on making his new class schedule for the following semester. While he is making his new schedule he is looking to see if any of his classes do not have conflicting times between each of the classes. Our new Student center will help Liam and others to schedule classes. This class schedule will integrate the school's class scheduling website into the student center. So when a student is scheduling their class for the next semester they are able to see what classes are offered and can immediately add those classes without having to go to another window. With this, it would allow the users to see the classes that are added on a calendar, which also shows if the classes are conflicting with time and will give suggestions on the same classes but with different times instead.
Diagram	

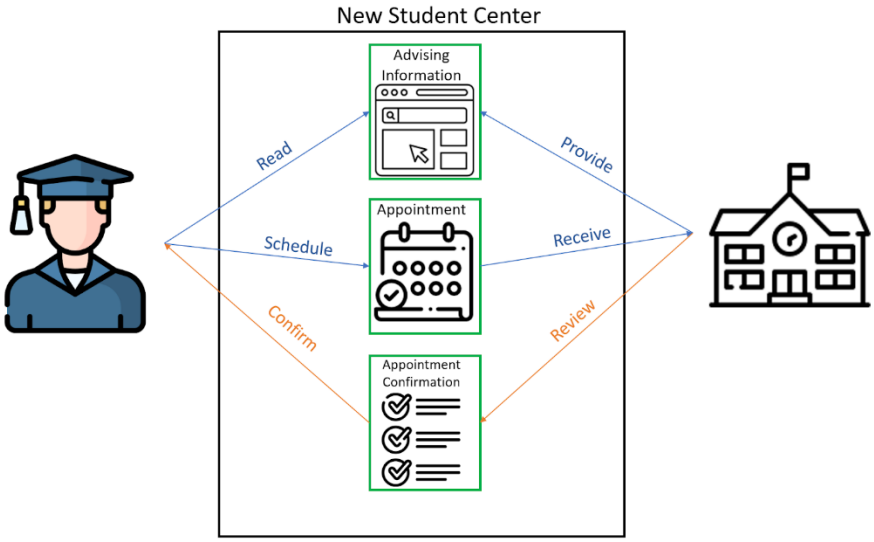
Use Case 4

Title	Paying For Classes
Actor	Andy (freshmen College Student)
Description	Andy is a freshman college student. He complains that the University student center is ancient. He spends a week figuring out which classes he needs to take. He thought the university would send a bill to his house and that he needed to send back a check to pay off the tuition. However, after a week, his student center notifies he needs to pay off the class fee, otherwise, he will be dropped from the classes. The student center doesn't have a payment system for the student to pay off their class. Andy has to go back to school on weekdays to pay his tuition. Our student center provides credit cards, debit cards, and PayPal payment systems to allow the student to pay off their tuition within five (5) minutes. Our student center will notify students when the payment is due by sending a text. In addition, our student center can show the history of payments, so students know how much they spend on the university.
Diagram	

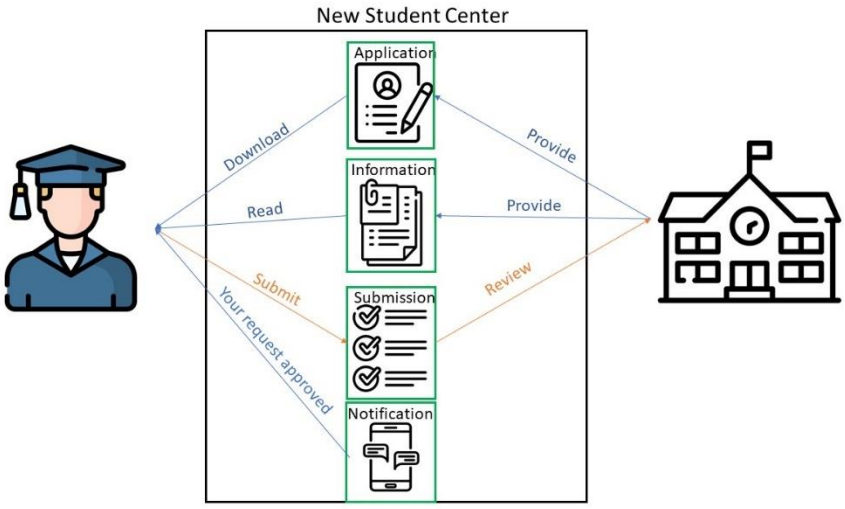
Use Case 5

Title	Accessing Student Records
Actor	Marry (Student), San Francisco state university (college)
Description	Mary is a student that is in her last year at San Francisco State University. She wants to know how many classes she has left. So she looks at her student records to see what classes she has left to take. She also wants to know what classes are offered during both the Spring and Fall semester for the remaining classes she has left to take. Our new student center will make it easier for Mary and others to see how many classes they have left. It will be easier for her to see how many classes she has left by displaying all of her classes at the top of the page starting with the classes required for her major first and then it would also show any of the GED classes that she has left to take. Along with showing the classes she has left, the student records will also show when the classes she needs are offered, i.e during the Spring, Summer, or Fall, right next to them.
Diagram	

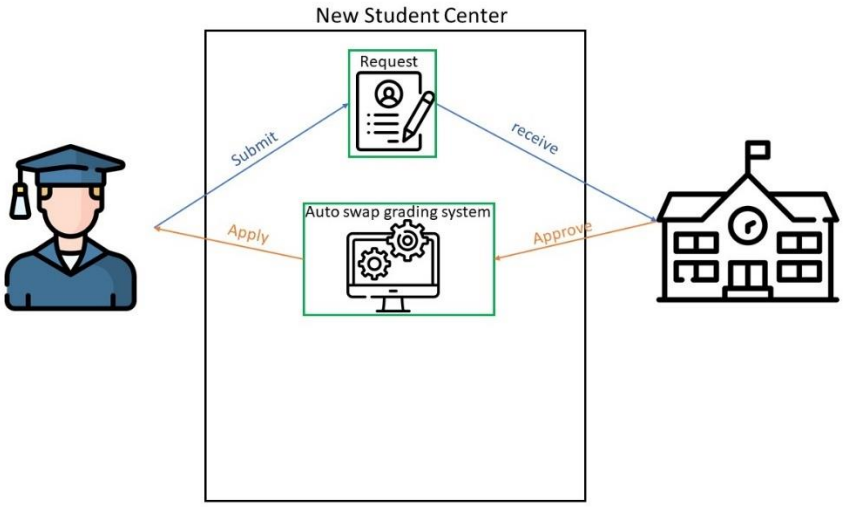
Use Case 6

Title	Scheduling Advising Appointments
Actor	Jack (Student), SFSU
Description	Jack is an incoming freshman at San Francisco State University. He was accepted as a Psychology major, but he is unsure what classes to enroll in for his first semester. He wants to schedule an appointment with an advisor to discuss what classes to take. However, he is unsure how to do this. He checks the student center and can't find any relevant information. He can only find advising plans and notes, but nothing related to actually making an appointment with an advisor. Jack is now left wondering what he has to do to schedule an advising appointment. Our new student center will help Jack and other students schedule advising appointments. Students will no longer have to navigate through the SFSU website to find information about advising hours and how to schedule appointments. All of this information will be provided by the new student center, leading to time saved for students and preventing confusion.
Diagram	

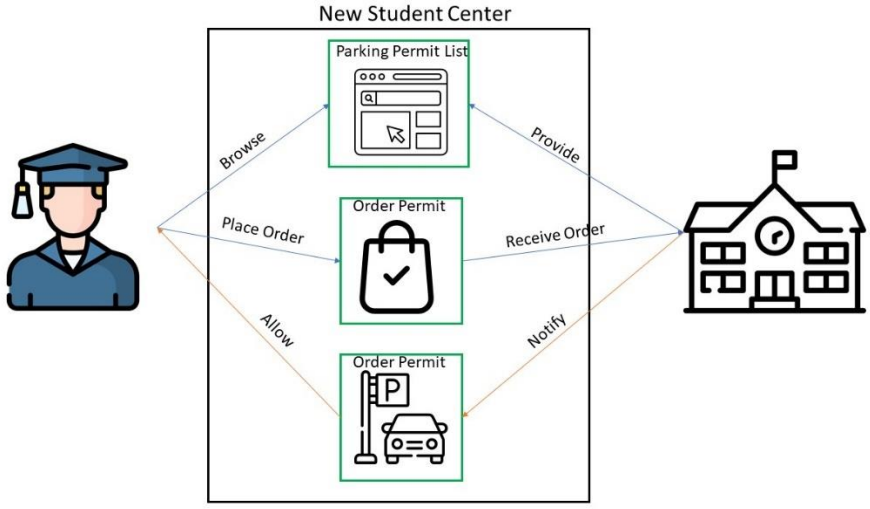
Use Case 7

Title	Changing Major
Actor	Billy (Student)
Description	Billy is a sophomore who has become disillusioned with his major after not enjoying his classes despite passing them. Billy wants to change his major to something he might enjoy more. He deliberates with his parents and he finally decides to switch to Computer Science. He looks around for a bit and has trouble finding where to declare and change his major. He is confused by the wording and the structure of the student center. He is unsure if his request to change his major actually went through, as he did not receive a confirmation via email. Time passes and he checks to see if his major request was accepted. It was accepted, but every time he wanted to check he had to log into his student center. Our new student center will send an email to Billy to tell him of the confirmation that his major request was accepted. We will also give him links to resources for his new major.
Diagram	

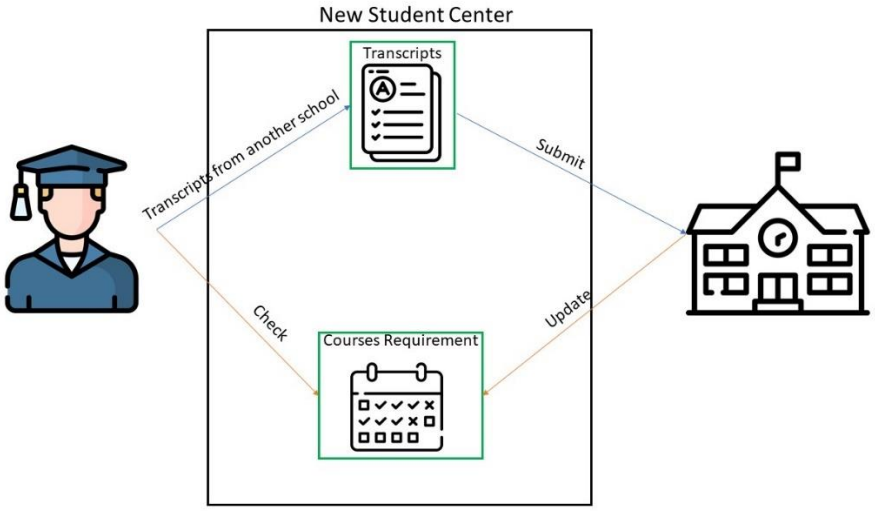
Use Case 8

Title	Appealing For Grade Change
Actor	Jimmy (Student)
Description	Jimmy is a junior who has been going through a rough patch in school. This semester he has not been able to focus on school. Because of this, he changed his grading methods for his classes from letter grade to credit/no credit to prevent a drop in his grade point average (GPA). He plans to retake the classes next semester. However, to Jimmy's surprise, he manages to pass a few of his Major required classes. Because of school policy, he must receive a letter grade for the classes associated with his major. Jimmy must then send an appeal to the dean and the head of his major department for a change from CR/NC to a letter grade. Our new student center will have ways to directly contact the dean and the head of his new major. This will help Jimmy be able to keep all of his concerns within the student center without having to send external emails.
Diagram	

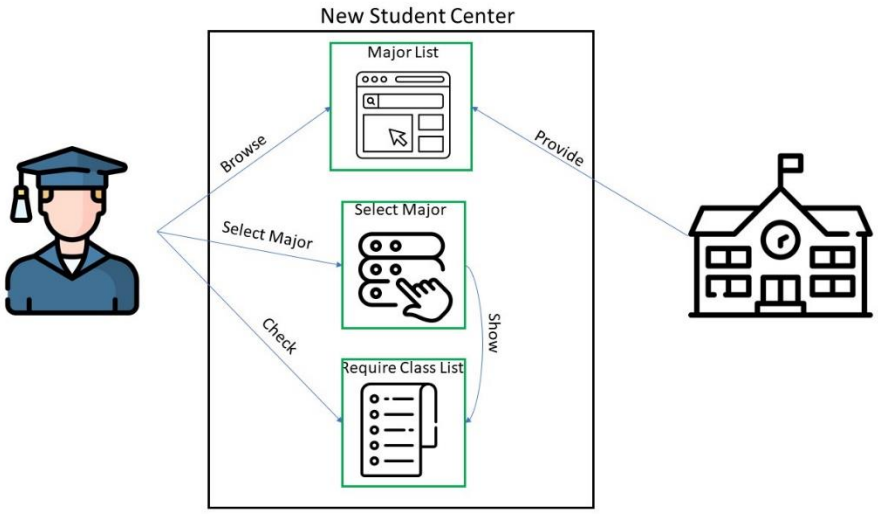
Use Case 9

Title	Paying for Parking Permit
Actor	Annie (Student), SFSU
Description	Annie is a student at San Francisco State University who lives off campus. She drives to class every day and wants to use the school parking lots. However, she does not have much information regarding parking permits. She decides to check the SFSU student center, but cannot navigate to a webpage where she can find information on how to acquire a parking permit. She is now confused about what steps to take next in learning about and acquiring a parking permit Our new student center will help students, such as Annie, find information about parking permits more easily. Students like Annie will be able to learn about the different types of parking permits and their prices through our student center. They will then be able to make a better-informed decision as well as pay for the parking permit. With the new student center, students will no longer have to search through the SFSU website to look for information regarding parking permits.
Diagram	

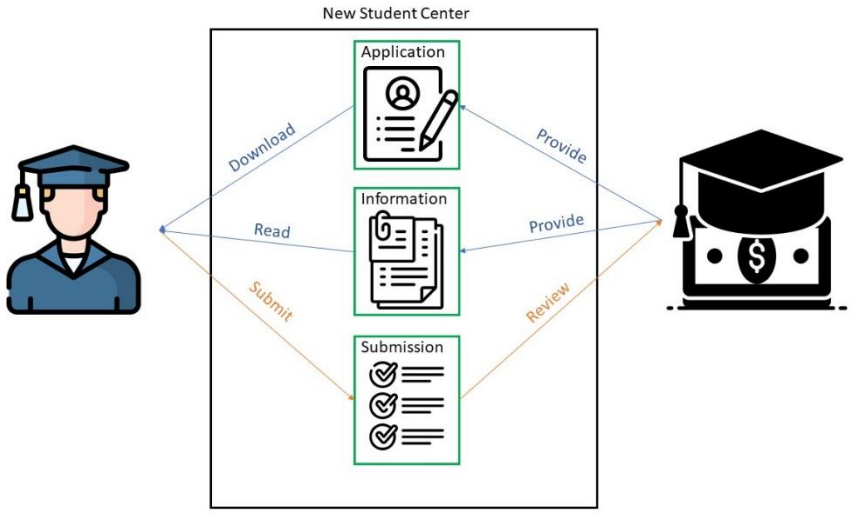
Use Case 10

Title	Transferring credit
Actor	Becky (student)
Description	Becky is transferring to SFSU from a different college. She has already declared her major and has taken the respective courses, but she wants to know which courses will be transferred over. Becky tries to navigate through the SFSU student center, but has to go scrolling through other menus to finally find the transfer credit report. When she does find it, the report doesn't show which major requirements were fulfilled by her transfer classes. It only shows the equivalent SFSU course and the credits she got for it. Becky is left still unsure which courses she has to complete to earn her degree. Our new student center will help Becky and other transfer students quickly and easily figure out which of their courses transferred to SFSU for credit. She can manually select the school and the classes she took at that school and she can then see if the classes are eligible for transfer. Another option is she can enter her old school's credentials and her transcript will be automatically pulled and she can see which credits will be transferred over. The transfer credit report will also show her which of the major requirements were fulfilled by transfer courses.
Diagram	

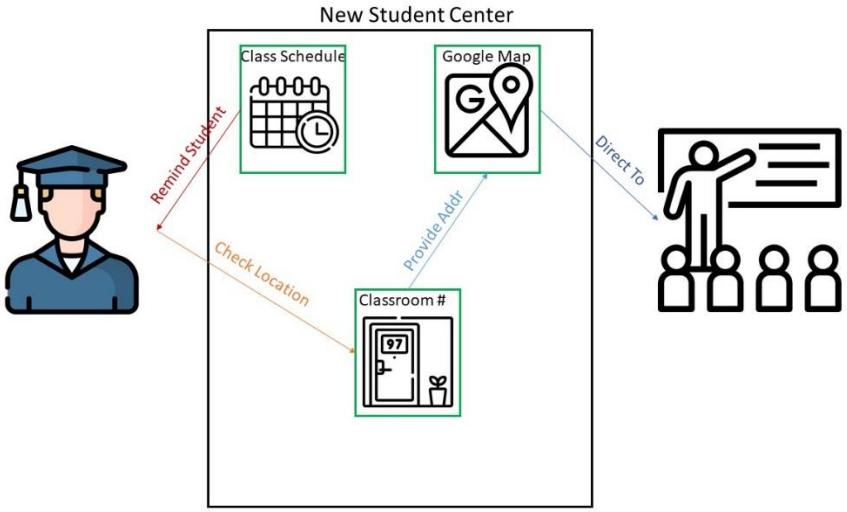
Use Case 11

Title	What-if report
Actor	John (student)
Description	John is a current student at SFSU but wants to know what will happen if he takes certain classes over others or if he were to switch his major. He goes onto the SFSU student center to look for a what-if report. However, he has to scroll through other submenus to find it. When John does find the what-if report feature, he has to go through several steps to generate it. In addition to this, the what-if report is cluttered, leaving John confused. Our new student center will provide students with more organized and clearer what-if reports. If John wants to change majors, he can look through the list of majors offered by SFSU and select one that interests him. A what-if report will be generated, showing him the list of classes he has already completed for the major and the classes he still has to take. He also has the ability to save the list of classes so he does not have to re-enter the information.
Diagram	

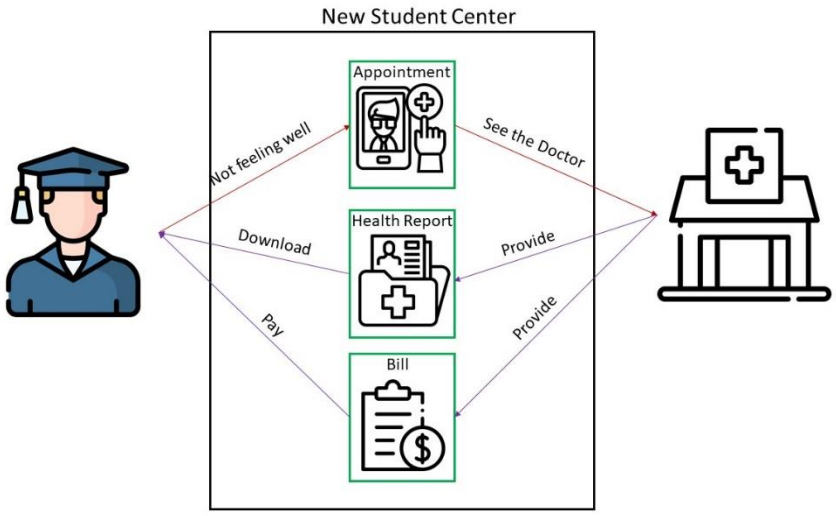
Use Case 12

Title	Unable to find financial aid information
Actor	Student Zhang
Description	Zhang is a graduate high school student and he will be a freshman college student in the following semester. He is anxious because he does not know where to find the information about financial aid. However, the university student center only provides an option that accepts or rejects financial aid. He needs to make an appointment with the university advisor to learn more about financial aid. However, the university advisor is only available next month. Zhang is worried that he will miss the financial aid submission window. Our new student center integrates a financial aid system to help freshmen college students like Zhang know where, how, and when to submit their financial aid applications. Our new student center also provides an appointment scheduling system for students to directly make an appointment with the financial aid advisor.
Diagram	

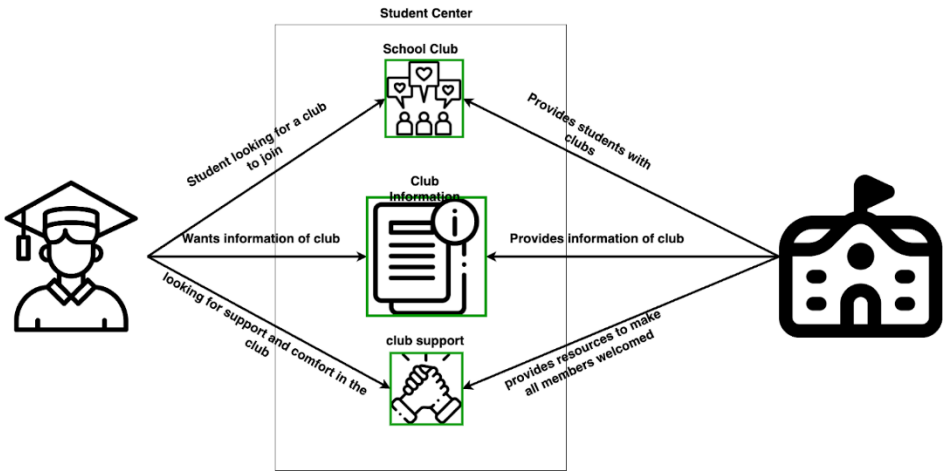
Use Case 13

Title	Difficult to find classroom
Actor	Student Sun
Description	Sun is a freshman college student and tomorrow is the first day of college life. He is exhausted because he has four (4) classes and they are all in different buildings. He spends three (3) hours going around the campus to find all his classrooms. However, he still does not remember the exact locations. He complains that the school should have a digital map. With our new student center integrating Google Maps, freshmen students like Sun can open Google Maps on the student center and the map will guide them to the correct building. Our new student center helps Sun and another student who has a poor sense of direction save lots of time memorizing the location of the classroom.
Diagram	

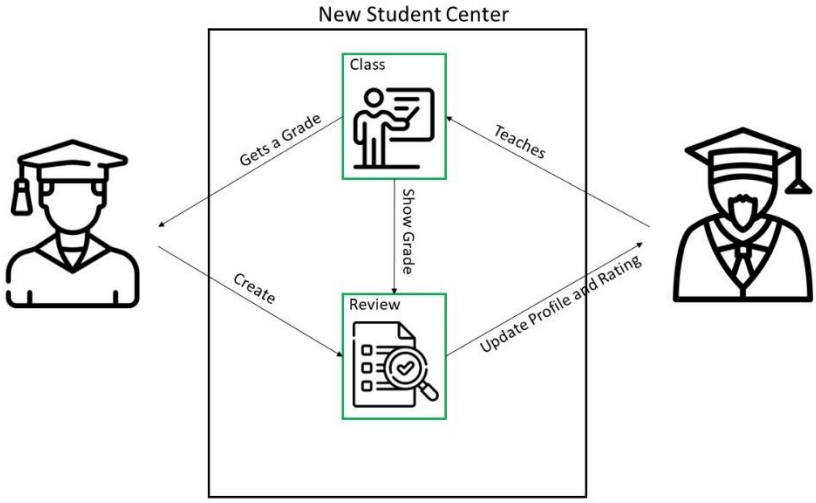
Use Case 14

Title	Lack of clinical support
Actor	Student Han
Description	Han is an international student. Recently, he got sick and he is looking for some clinical support. He goes to the student center to try to make an appointment with the campus clinic. However, the university student center has not integrated the campus clinical service. He needs to google the clinical service for his university to make an appointment. He complains the university service is too scattered and he has to google the corresponding service rather than integral in one place. Our new student center integrates the university health services. Students can make an appointment with a university client and upload their health records to the university client
Diagram	

Use Case 15

Title	Club Resource
Actor	Isla (Student)
Description	Isla is a first-year international student in her second semester. Recently, she has been feeling like she does not know where she should go in life. She has no one she can take with her, and her classes are coming up. She searches for an international club but it is nowhere to be found. Isla feels like there is a lack of resources when trying to find a new community, and the language barrier makes it more difficult to meet new friends. Our new student center is integrated with student activities and student clubs. Students like Isla can easily find clubs or activities they are interested in. She can use our new student center to find information about international student clubs, sports clubs, etc. Our new student center enhances the student's sense of belonging. Our new student center gives as much support as it can to the student.
Diagram	

Use Case 16

Title	Reviewing Professors
Actor	Jody (student), Ralph (professor)
Description	The school semester has ended, and Jody has just received the final grades for each class. She remembers liking professor Ralph's history class and wants to leave a review on the Student Center to express her thanks to the professor, and also to help other students know how useful and interesting the class was. When viewing past semesters' schedules, Jody can view each of the courses taken, and can leave a review for that course if she wants to. The system will warn her that even though the review will be posted anonymously, the review will display the course she took along with the grade she received, and it will be publicly viewable under the professor's profile page. She can then write the review, and select tags that accurately describe her experience taking the course, which will be used both to describe the course as a review, but also as a possible search parameter for any students making searches for professors that have certain teaching styles.
Diagram	

Main Data Item and Entities

1. Student - Our end users. Can enroll in course sections.
2. Transfer Student - A student that came from another college. Has a special student record called ‘past transcripts’ for courses taken at other colleges.
3. Undergraduate Student - A student that has not yet graduated with a degree.
4. Graduate Student - A student that has graduated with a degree.
5. Full-Time Student - A student that is taking enough units that would be equivalent to a full-time job.
6. Part-Time Student - A student that is taking less units than would be equivalent to a full-time job.
7. Course (sometimes referred to as “Class”) - The main product for the student.
8. Credit (sometimes referred to as “Unit”) - A unit of measurement for the time/effort of a course. A student needs a certain amount to graduate.
9. Course Section (sometimes referred to as “Section”) - A specific instance of a course. Associated with one professor and one date & time slot.
10. Online Section - A type of course section that has no location and is held fully online.
11. Synchronous Section - A type of online course section that has synchronous meetings over a video call.
12. Asynchronous Section - A type of online course section that does not meet and has no time slot.
13. Hybrid Section - A type of course section that combines elements of in-person classes and online classes.
14. Subject - An attribute of courses that are often associated with a major.

15. Location - An attribute of course sections that details where it takes place.
16. Time Slot (sometimes referred to as “Date & Time”) - An attribute of course sections that details when it takes place.
17. Course Component - An attribute of a course section describing the kinds of learning activity the student would be doing. (e.g. Lecture, Lab, Self-Study, etc.)
18. Course Materials - An attribute of a course section describing the kinds of materials the student may need to purchase to take the class (e.g. textbooks)
19. Major - An attribute of a student. Can determine what types of classes the student can take.
20. Student Record - A type of form that also acts as an attribute of students. Having certain completed records affects how the student can interact with the system.
21. Transcripts - A type of student record. A list of previously enrolled courses, and the grades received from them.
22. Student Calendar - A list of dates & time slots.
23. Class Schedule - A type of Student Calendar containing only the dates & times of the student’s course sections.
24. Appointments - Has a date & time, and acts as an element in a calendar, just like course sections.
25. Prerequisite - A type, of course, that is also an attribute for another different course. The prerequisite must be completed concurrently with, or before the student takes the associated other courses.
26. Professor - The teacher of a section. Can modify course section information.

27. Advisor - An employee of the university that specializes in helping students with school-related questions.
28. College (sometimes referred to as “University”) - The client organization. Uses the system to offer courses to students.
29. Department - A subsection of a college that facilitates learning for specific subject(s).
30. Campus Clinic - Site that students can visit for health-related issues.
31. Student Club - A school-recognized student organization. Associated with a faculty advisor.
32. Parking Permit - A form that grants students access to parking.
33. Bill- A form that shows students' transactions after purchase.
34. Charge - An element on a bill. A specific amount the student owes for a specific purpose.
35. Aid Form - A form that shows students’ financial aid information.
36. Map - An image showing the geographical layout of a location.
37. Schedule - an itinerary that you follow throughout the day.
38. Notification - an alert that notifies the student of an important message.
39. Holds - A property that prevents students from enrolling until resolved.
40. Search Parameter - An attribute or specific value of an attribute that is used to filter/narrow down elements from a full list of elements.
41. Course Requirements - a course that is required in order to take the next course.
42. Health Records - records that inform the school/doctor about one person's health information.

Functional Requirement

1. Student

1.1 Students shall log in before accessing the system.

1.2 Students shall be able to enroll in course sections.

1.3 Students shall not be able to enroll in a class that would cause the student to exceed the set unit limit.

1.4 Students shall not fully enroll in more than one section of the same class.

1.5 Students shall be able to search for courses.

1.6 Students shall be able to add courses to a shopping cart, prior to enrolling.

1.7 Students shall be dropped from a course if they cannot prove they have first taken the course's prerequisites, or are currently taking the course's prerequisites.

1.8 Students shall have transcripts.

1.9 Students shall have a class schedule.

1.10 Students shall not fully enroll in multiple sections that overlap on the same date & time slot.

1.11 Students shall have a student calendar, showing the student's class schedule and the college's academic calendar.

1.12 Student calendars shall recommend alternative course sections in order to resolve date & time conflicts on the class schedule.

1.13 Students shall be notified if a course section on their calendar has any of its attributes changed. (students should know if there's a change of professor or change of location)

1.14 Students shall be able to drop course sections.

1.15 Students shall be able to swap one course for another.

1.16 Students shall be able to pay for courses.

1.17 Students shall receive a Hold/Alert if they have overdue charges.

1.18 Students shall be notified whenever new Holds/Alerts are created on their account.

1.19 Students shall be dropped from courses if they have overdue charges after the set deadlines.

1.20 Students shall be notified of payment due dates.

1.21 Students shall be able to access their payment histories.

1.22 Students shall be able to access their student records (including transcripts and payment receipts).

1.23 Students shall be able to schedule advising appointments.

1.24 Students shall be able to change their major.

1.25 Students shall be notified when a change of major is fully processed, regardless of whether it is accepted or rejected.

1.26 Students who’ve recently changed majors shall have access to resources for their new major.

1.27 Students shall receive a grade, upon completing a course.

1.28 Students shall enroll in courses with one of two grading options: CR/NC or Letter Grade.

1.29 Students shall be able to switch between grading options before certain date & time slots.

1.30 Students shall be able to contact the department of their major.

1.31 Students shall be able to view their financial aid.

1.32 Students shall be able to purchase parking permits.

1.33 Students shall be notified if their permit purchase was approved.

1.34 Students shall be able to make an appointment with the university clinic.

1.35 Students shall be able to upload their health records.

1.36 Students shall be able to open Google Maps in the student center.

1.37 Students shall be able to search for clubs at the university.

1.38 Students shall be able to generate What-If Reports.

1.39 Students shall be able to save their What-If Reports.

1.40 Students shall be able to receive Financial Aid.

1.41 Students shall be able to schedule financial aid appointments.

1.42 Students shall be notified of upcoming appointments.

1.43 Students shall be able to leave feedback reviews for professors of course sections that the student has taken before.

2. Courses

2.1 Course sections shall have a waitlist.

2.2 Course sections that are full shall place enrolling students on the waitlist.

2.3 Courses shall require prerequisites.

2.4 Courses shall tell the students which classes are required as prerequisites.

2.5 Courses shall belong to one (1) subject.

2.6 Course sections shall have time slots.

2.7 Course sections shall have a location.

2.8 Course sections shall have a list of the average grade received by students in past semesters.

2.9 Courses shall tell the student if the class is online, in person, hybrid, synchronous or asynchronous.

2.10 Course sections shall have a number of seats.

3. Waitlist

3.1 Waitlisted students shall be notified when they are able to fully enroll in the section.

3.2 Waitlisted students shall be automatically enrolled if space is available.

3.3 Waitlisted students shall be notified if they are dropped from the waitlist.

4. Searches

4.1 Searches shall have parameters, which filter the displayed courses.

4.1.1 Searches can be filtered by student's eligibility to enroll in the course.

4.1.2 Searches can be filtered by professor.

4.1.3 Searches can be filtered by location.

4.1.4 Searches can be filtered by date & time.

4.1.5 Searches can be filtered by attribute. (online, asynchronous, lab, lecture)

4.1.6 Searches can be filtered by course name.

4.1.7 Searches can be filtered by course number. (not CRN)

4.2 Searches shall display a list of courses.

4.3 Searched course sections shall display all their important data in the listing. (CRN, professor, location, date & time, units, name)

4.4 Searched course sections shall display on mouse-over, less important data in the search listing. (description, past grade averages, professor ranking, etc.)

4.5 Searched courses shall be add-able to the student's shopping cart.

5. Transcripts

5.1 Transcripts shall list all courses taken in the past.

6. Class schedules

6.1 Class schedules shall show a student's enrolled courses.

6.2 Class schedules shall show a student's waitlisted courses.

6.3 Class schedules shall show courses currently in the student's shopping cart.

7. Payment

7.1 PayPal shall be supported as a payment method. (non-functional?)

8. Advising

8.1 Advisors shall be able to schedule appointment time slots. (maybe lower priority? I know we wanted to focus on the student side of the website before tackling the faculty side)

9. Transferring

9.1 Transfer students shall be able to search for other colleges' courses to check if they count as being transferred.

10. What-if report

10.1 What-If Reports shall show students the required classes for hypothetical change of major, degree, or other academic career choices.

11. Professors

11.1Professor reviews made by students shall be anonymous.

12. Professor Reviews

12.1 Professor reviews made by students shall be anonymous.

12.2 Professor reviews made by students shall show the grade of the student publishing the grade.

12.3 Professor reviews shall only be made by students who have completed a course section that the professor has taught.

12.4 The system shall notify reviewers that their received grade will be displayed along with their anonymous review.

12.5 Professor reviews shall be displayed under a professor's profile, as well as within the attributes of any course section taught by that professor.

12.6 Professor reviews shall have tags to help students parameterize searches when filtering for professors with certain teaching styles.

Non-Functional Requirement

1. Security

    1.1 The system shall make sure the data is encrypted.

    1.2 The system shall have security questions.

    1.3 The system shall lock the user out after five failed attempts to log in (functional?)

    1.4 The system shall automatically log users out after a certain period of time for security.

    1.5 The system shall only support login via email, username, or student ID.

    1.6 The system shall not allow authenticated persons to log in to the admin panel.

2. Performance

    2.1 Pages shall load within one (1) second.

a. The current SFSU student center can take ten (10) or more seconds to load.

    2.2 Pages shall adjust accordingly to the user's device.

    2.3 The system shall be able to handle multiple visits at once.

    2.4 Searches shall execute in under one (1) second.

3. Maintainability

    3.1 Maintenance shall be done at night in the college's timezone.

    3.2 Maintenance shall be kept as short as possible.

    3.3 Testing shall be performed regularly.

    3.4 The system design have to be easy to maintain.

    3.5 The system design have to be easy to maintain.

4. Usability

    4.1 Pages shall be easy to navigate.

4.2 The system shall run without affecting other applications.

5. Data Integrity

5.1 Data in the system shall be backed up every day.

5.2 Professor reviews shall be approved before they're published.

6. Capacity

6.1 The search feature shall have no cap on the amount of courses displayed. (currently, SFSU won't let a student make a search that would result in 300+ classes. If necessary, split it into pages rather than prevent a student from searching.)

7. Support

7.1 The system shall support English.

7.2 The System shall use Google Translate to support languages other than English.

7.3 The system shall use Google Maps as the integrated map system.

7.4 The system shall support PayPal as a payment method.

7.3The system shall reflect any updated payment/financial information within 24 hours of the transaction's initiation.

8. TeamWork

8.1 The team shall form a consensus agreement before any push to the main git branch.

8.2 The front-end team and back-end team shall all agree before pushing edits to the master branch.

8.3 Both front-end and back-end leads shall get approval before pushing a major edit to the master branch.

8.4 Edits to the database shall be approved by the database master.

Competitive Analysis

Stanford Axess

Axess is a student online portal for enrolling in classes, checking grades and degree progress, seeing your financial aid awards and tuition changes, filling out online course evaluations, and many other things. The advantage of Stanford Axess is the high integration. Students can base on the previous average GPA for the course and the review of the professor to choose the best professor for the course. The Stanford Axess has a nice UI to display the class schedule to help students not select the classes with an overlapping schedule. The Stanford Axess is integral with lots of campus resources such as housing, and a health center. The disadvantage of Stanford Axess is that only Stanford students can access it. According to the Stanford admission office, there is only a 5% acceptance rate in the amount of 55,471 applicants. The data shows only a few elites can use the Stanford Axess which means the cost of using Stanford Axess is money and intelligence. The second disadvantage of Stanford Axess is the server will crash on the class enrollment date. This is a serious problem because students are not able to enroll in classes, pay for tuition, or do any other important things. A university student center should be considered to handle high network traffic on the enrollment date.

SFSU Student Center

The SFSU enrollment system is called the Student Center. One of the main advantages is that there is a broad range of important and useful information that is presented to the student upfront. The sidebar on the right is used to notify students of important details, including Holds & Alerts, To Do List, Important Links, etc. Additionally, the two main sections in the middle, both have their most prominent element showing data relating to the current or near future, with the Academics section showing the This Week's Schedule, and the Finances section showing the Outstanding Charges.

The biggest flaws of the SFSU Student Center are its organization and UI. These combined together greatly hinder the user's experience and negatively affect the usability of the site. Outside of the Student Center, the other pages have very different UI patterns, which makes it seem inconsistent and creates a very confusing and difficult navigation experience. There is a very poor use of horizontal space, which leads to excessive data compressed into the left side of the screen, which also leads to unnecessary amounts of scrolling up and down, for the student to find what they're looking for. The deeper you go into the website, often the more horizontal headers will appear at the top of the screen, which is not only a poor use of space but is also confusing when the student is changing scope and these nav bars are constantly appearing and disappearing as the student moves between layers of the website. An example of this kind of confusion is when a student clicks on the "Home" link that is at the top right of the nav bar that is second from the top (these 2 nav bars seem to almost always be present). The student may think they're going back to the Student Center since that's the first page they loaded into, but instead, they are sent to the "Homepage" which seems to be a semi-customizable page that by default

contains a menu that contains the same navigation options as the nav bar that is first from the top. In order to get back to the Student Center, the student would have to navigate this menu (or the redundant nav bar) and find the Student Center inside the Self-Service drop-down section.

Another big flaw is performance. The site loads pretty slowly, and the loading symbol that sometimes shows in the upper right, is often hard to notice, which can lead to students not knowing whether their inputs are being registered. Keep in mind, that it was previously stated that the layout doesn't populate the right side of the screen, so the user isn't conditioned to notice things popping up there, so it is very easy for them to miss it. This loading symbol also doesn't always show up, which is an inconsistency that is also confusing.

There is also often a lack of navigation, even where there are good opportunities for it. An example of this is searching for classes. After performing a search, a student will see a list of course sections that fit the search criteria, with each section also showing some of its details (not all of its information though, e.g. grading options, # of credits). This is a missed opportunity for increased interaction, wherein a student could click on one of these attributes and immediately navigate to a page relating to that attribute (e.g. click on the professor's name and immediately be transported to that professor's bio page, or even a page listing all classes taught by that professor).

The flip side to the above is that the website also has cases of excessive navigation. Often when the student wants to do something, the site will ask the student to confirm their decision but will do so by navigating to a completely separate confirm page, instead of the

traditional popup element. This is not just inefficient, it is also extremely costly to the student, as they have to reorient themselves every time this happens, and also cannot rely as easily upon the browser's built-in go-back and go-forward features, since they often don't lead to the expected page. For whatever reason, the go-back feature also often leads to a page that claims that the page is no longer available, and forces the student to return to the most recent active page. This is confusing and shouldn't happen.

MyOSU

MyOSU is the student center that Oregon State University utilizes. Advantages include the student DashBoard being more organized. The Student Board for Organstate is a lot more organized than the SFSU student dashboard. You are able to access more of the important information without having to use a scroll menu.

The main page gives easy and direct access to your student information without the need to use a scroll menu to go to certain specific pages. They gain easy access to canvas, student records, schedule of classes, the overall overview of their standing, and if the student has any fees that have not been paid yet. Even though their student center doesnt make it so you can hide some information, it is more organized and shows the more prioritized items at the tops of the list and the information that is not as prioritized on the bottom of the list.

One of the main disadvantages to this school's student center would be how most of the stuff for this student center is all there. What I mean is that even though it gives easy access to the student records and class scheduling some of the features could be combined to make it easier to search for what you need. Another thing is that for some who have never used a student center it might be a bit too much to take in because of all the information that is being given to that student.

The main advantage of the MyOSU student center is that access to all the student information is much more convenient and very pleasant to look at because of how organized the whole student center is compared to MySFSU. The SFSU student center is not as organized as the OSU student center. Our for the new student center is to organize

our school information as OSU did by prioritizing our student resources by showing the class schedule for the week on the front of the page and on the sides; we will show you student resources, i.e., student records, scheduling, and everything else that we would usually see when looking at our student resources. It also allows us to prioritize necessary student resources and those that are not as necessary.

One thing that stands out about the OSU student center is how organized they are but separating each section into blocks by showing the student's academic overview on the front of the page. Seeing how you are doing can help students preserve and try to push themselves to do better than they are doing at this point. It is also nice because the overview lets the student know if they have any fees they have to pay and what their academic standing is. This student center integrates the student dashboard and provides easy access to the canvas without having to leave the student center. Another thing to add is how accessible the student center is with a tab for your academics and finance. Accessing these without the need for drop-down menus clears up more space for other sessions and helps with organization. The organization of this student center makes it more user-friendly and straightforward, so you will not be as lost if you never used a student center before.

WebSMART

WebSMART is the student center used for the San Mateo County Community College District, which is composed of Cañada College, College of San Mateo, and Skyline College. The homepage for WebSMART is a lot less cluttered than the SFSU student center. All of the main services offered are clearly displayed. This is contrary to the SFSU student center, where there are dropdown menus to find other services.

The home menu of WebSMART shows the main features. These include student services, financial aid information, and student profile information. Student services include registering for classes, student records, degree progress, and making appointments among other things. The financial aid services offered include viewing your financial aid status and eligibility. Other services related to updating your personal information.

The main advantage of WebSMART is its simplicity. Students can quickly and easily find what they're looking for. As mentioned before, the home page displays the main services offered, allowing students to quickly navigate to what they need. For instance, for anything class-related, students can click on the student services tab, where all the services offered are listed with a short description of what each service does. This is one feature that makes WebSMART stand out from the SFSU student center. On the SFSU student center, certain features such as viewing your degree progress can be hard to navigate to, as it isn't directly listed. You have to go searching for it by opening the dropdown menu under academics, as opposed to WebSMART, where it is directly listed under student services. Furthermore, all of the services are clearly listed without the need of scrolling down the page or clicking any dropdown menus.

One disadvantage of WebSMART is that a lot of the services offered can be overwhelming. For example, under student services, there is a plethora of options ranging from registering for classes to ordering parking permits and updating emergency contact information. WebSMART could be improved by dividing all of the services they offer into more subcategories. Services like updating emergency contact information could be placed in the “My Profile” section. In addition to being overwhelming at times, the front-end design of WebSMART leaves a lot of blank white space, especially on the home page.

A characteristic of WebSMART that makes it stand out from other student centers is that its class search feature is handled through another website called WebSchedule. Students are redirected to WebSchedule when looking up classes to add through WebSMART. WebSchedule allows students to look up classes at Cañada College, College of San Mateo, and Skyline College. Similarly, the degree progress service is handled by a separate tool called DegreeWorks.

My UCSC

MyUCSC is the student center hub utilized by UC Santa Cruz. Advantages include being able to use the back button without being prompted to return to the page you were previously at before pressing the back button when trying to navigate to a new page. The load times are much faster than other student centers such as SF State and seem to be more responsive to user requests.

On the main page of the student center, there is a clear and direct emphasis on what aspects of the student center are important. The important pages that a student would likely go to are placed next to each other. Pages such as Search, Plan, Enroll, Grades, and My Academics are the first things placed on the page. The other lesser important parts are placed in a drop-down part to prevent cluttering and information overload.

The class search has a much nicer UI, with a dedicated page to it that is centered and more aesthetically pleasing. As for the functionality of the search, there is an emphasis on being able to decide which format of classes you wish to participate in. There are checkboxes to choose whether or not you want to take Asynchronous, Online, Hybrid, Synchronous, Online, or In Person classes. These are important aspects that the UCSC class search emphasizes in a post-covid-19 world.

The main advantage that UCSC has over its competitors is the ability to save previous states of the webpage. You are able to use the back button to load a previous page you were on and immediately interact with it. The current SFSU student center does not allow you to do this. Our student center plans for us to be able to also save the state of the

pages we are on and be able to go back to previous pages and have that be the current page state we are on.

One thing that is notable about UCSC is that they have two different forms of login identification. There is a “Gold login” and a “Blue login”. Gold login is similar to a central hub for the user. You can enroll, add classes, manage finances, check grades, plan your degree, view messages, and manage financial aid. This version of their student center has less security and is mainly for basic management of the school environment. “Blue login” is where most of the higher security management takes place. When you want to pay for finances, view medical details, or access financial aid, you must first log in using your “Blue login” credentials. This acts as a sort of a 2FA version of security. This form of security creates a separation between the day-to-day environment of the “Gold login” and the “Blue login” which you will likely only need to do every so often, primarily when making big decisions or paying finances at the beginning of the semester.

The uniqueness of our project

The innovation of our new student center is to bring professor/course ranking to the public universities. In our research, only the private university like Stanford provide professor ranking system to students. The second innovation is our new student center has a modem design UI. In our research, most of the student center in public university like UC and CSU have ancient design. For example, the text is small, and the images doesn't align. Our professor/course ranking system provides a comment section to the professor. That give more reference for the students who are considering taking the course/professor. Our new UI design makes the student center easy to use because it is design for user usability. Student won't waste time look for opening a class selection page. They can finish adding class to their schedule within 10 mins.

Identity Important Features Table

Feature/C	SFSU Student Center	Stanford Axess	MyOSU	WebSMART	MyUCSC
Strengths	Important information is prioritized and noticeable.	High integration, clear and modem UI design, adapt to mobile and desktop devices.	Well organized and prioritizes the student's needs	Simple and easy to use. Important services are clearly displayed on the home page.	Fast loading times and is able to navigate between pages seamlessly.Has a high level of security, with two different passwords for different areasHas easy filtering for online, in-person, synchronous, and asynchronous learning
Weaknesses	Very badly organized. Slow and confusing to navigate. Poor use of space, excessive scrolling, and loading. Lots of redundant pathways and confusing extra features.	The server will crash at the class selection date. The website won't tell the user it's crashed but some of the functions are not able to use.	Some of the resources could be grouped together making a list smaller	The services offered aren't organized well, which can cause confusion. A lot of unused white space.	Does not have the greatest UI. Still has the problem of wasted whitespace. Hard to directly access counselor appointments and jump between pages that utilize different passwords
Pricing	Free to Students and Faculty	Free to Students and Faculty	Free to Students and Faculty	Free to Students and Faculty	Free to Students and Faculty
Social	No sources of Social Media	No sources of Social Media	No sources of Social Media	No sources of Social Media	No sources of Social Media
Onboarding experience	Few steps but long load times sometimes.	Moderate number of Steps	Smooth Instructions	Moderate number of Steps	Fast loading times and seamless transition between pages.

Typical Competitive Features Table

Feature	SFSU Student Center	Stanford Axess	MyOSU	WebSMART	MyUCSC	Our Product
Usability/UI	+	+	+	+	+	++
Class Schedule	+	+	+	+	+	++
Course Shopping Cart	+	+	+	+	+	+
Degree Progress/Transcript	+	+	+	+	+	+
Counselor Appointment	-	+	+	+	-	+
Class Search Feature	+	+	+	+	+	+
Course Management (Canvas/Ilearn)	-	+	+	-	+	+
Financial Aid	+	+	+	+	+	+
Professor Ranking System	-	+	-	-	-	+

High-level system architecture and technologies used

Server Host:	Microsoft Azure Standard B1s
Operating system:	Ubuntu 18.04
Database:	PostgreSQL
Web Server:	Nginx
Server-Side Language:	JavaScript
Front-End Framework:	React
Back-End Framework:	NodeJS

Check List

Team found a time slot to meet outside of the class	DONE
Github master chosen	DONE
Team decided and agreed together on using the listed SW tools and deployment server	DONE
Team ready and able to use the chosen back and front end frameworks and those who need to learn are working on learning and practicing	DONE
Team lead ensured that all team members read the final M1 and agree/understand it before submission	DONE
Github organized as discussed in class (e.g. master branch, development branch, folder for milestone documents etc.)	DONE

List of Contributions

Name	**Score**	**Contribution**
Elisa Hsiao-Rou Chih	9	Revising the Document with Grammarly Worked on Use Case Worked on non-functional requirements Organized the functional and non-functional sections by groups and categories. Worked on about page
Steven Paul Fong	9	Worked on Use Case 6,9,10,11 Worked on Section: List of Entities Worked on functional requirement Worked on Competitive Analysis, building tables and competitor's research Worked on about page
Cameron Michael Yee	9	Worked on Use cases 1 & 2 Worked on Section: List of Entities Worked on functional requirements Worked on Competitive Analysis and competitor's research Worked on about page
Michael Harrison Chang	10	Worked on Use Case 3&5 Building Diagram for Use Case 15 Worked on Section: List of Entities Worked on Competitive Analysis, building tables and competitor's research Revising the Document with Grammarly Organizes the Document Worked on the non-functional requirement. Worked on functional requirements Worked on about page
Christopher Alan Yee	9	Worked on Use Case 7,8,15 Analysis, building tables, and competitor's research Worked on functional requirements Worked on about page
Zhenyu Lin	9	Worked on Use Case 12,13,14 Draw diagram for half the Use Case Worked Analysis, building tables, and competitor's research Worked on about page