***ETPB Software Design™*** *| 212 McAlister Dr, Saint John NB*

*Architecture Draft*

*Studentable: A University Course Registration Management System*

**Architecture Draft**

**Purpose**

The purpose of the architecture draft is to ensure all stakeholders agree on the systems intended purpose, following use-case scenarios. The general description of Studentable will be stated with its features, and use-case scenarios will be made for each type of connection to the software.

**General Description**

The purpose of this project is for *ETPB Software Design****™*** to complete a framework University Registration Management System, formally known as Studentable.

Students and professors will sign into the system using their student emails and self-appointed passwords. This system will be entirely web based, requiring no installation of software on university computers. It will be hosted on the university's public domain, therefore no need for the use of a VPN to access it from home or work.

This system is be able to handle large traffic as in a worst-case scenario: students, professors, and admins can all be accessing it.

Studentable is an organized course catalog for students, instructors, and administration to use. The system allows students at a university to browse a course catalog that provides information on various course offerings they need for their semester. Students will be restricted to only four course offerings per semester, with two alternatives in the case that the other courses are cancelled or filled.

- This system detects when a course should be cancelled (less than 3 students), and when a course is full (more than 10 students).

- The system will send the student's billing information to the university's billing system upon registration completion.

A strict grace period is enforced where students are permitted to change their schedule at the beginning of the semester. During this grace period there is a special student portal that only students have access to using their school credentials. In this portal they can add/drop courses.

A special portal exists through the management system for professors which enables them to see which courses they are instructing, and who are the students enrolled.

Admin accounts are created for school faculty using the logon admin@university-domain.com. This account will allow the admin to perform customizations on the site and modify course information. The admin account is also responsible for the automation of creating new accounts and freeing up old accounts, which will be done through automation.

**Use Case Scenarios**

Student:

* From the viewpoint of a student, they will have a designated login/password authentication process before receiving access to the university registration management system.
* The student will query the registration system for information on the course(s) they wish to select/drop. A student is only able to either select/drop their four classes of choice with two reserved options in the case that the classes have an insufficient number of students or too many. Students may change their schedule as much as they wish until the date designated by the specific university’s registrar.
* After a successful registration in a course, the student will be billed by the registration management system and will then have to pay the course fee to the university’s own billing system. Once this fee is paid, the student will receive a proof of enrollment and payment.
* The student will be able to see the classes they are enrolled in, and also will be issued their bill for the semester.
* Students actions on the webpages will be logged for administrative purposes.

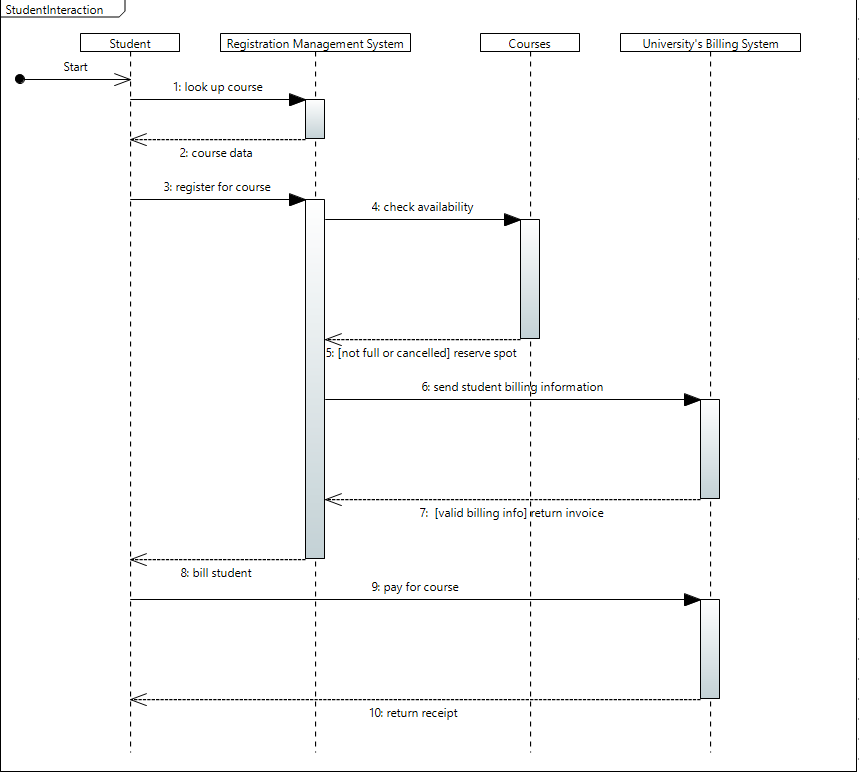
Instructors:

* The instructor will have to login with a designated login/password authentication process before being allowed access.
* When granted access, instructors will be able to query the attendance lists *only* on the courses they are teaching.
* Instructors actions on the webpages will be logged for administrative purposes.

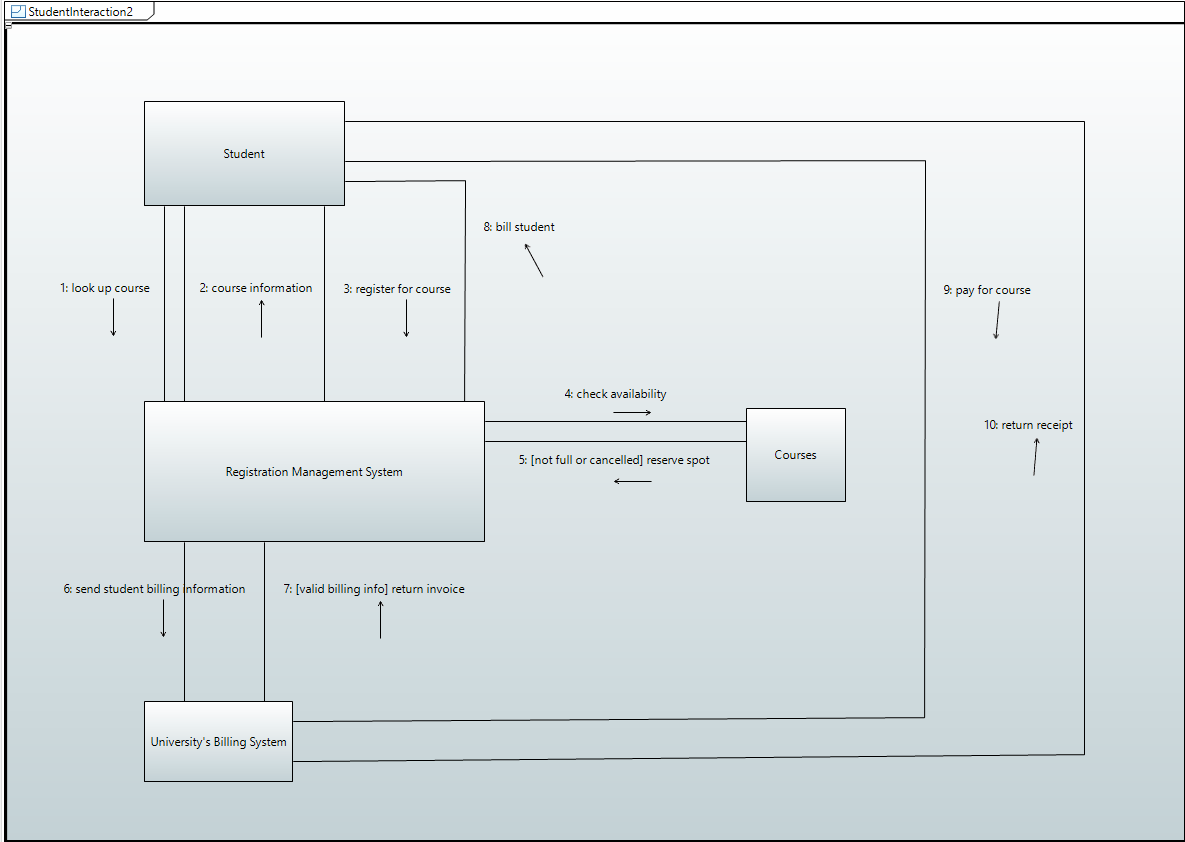
Admin:

* An admin’s perspective of the program begins by their specific login authenticity ([admin@university-domain.com](mailto:admin@university-domain.com)).
* Admins will have access to student view (what a student sees), professor view (what the professor sees), and the admin panel.
* Admins will be able to query for class information, class attendance lists, and student information. As well as access the activity log for the program, which details each action performed by professors, students, and admins in the system.
* Accounts of both instructors and students will automatically be made, however there is an option for the administrator to manually make the account.
* Admin’s can manually enroll or drop a student from a specific course given the student was unable to themselves.
* Admin’s are the only users with access to modify the University’s site page and course pages within the registration system. Modifications include adding new/removing old courses, customization according to University colors/logo, deciding what information is displayed on a course page.

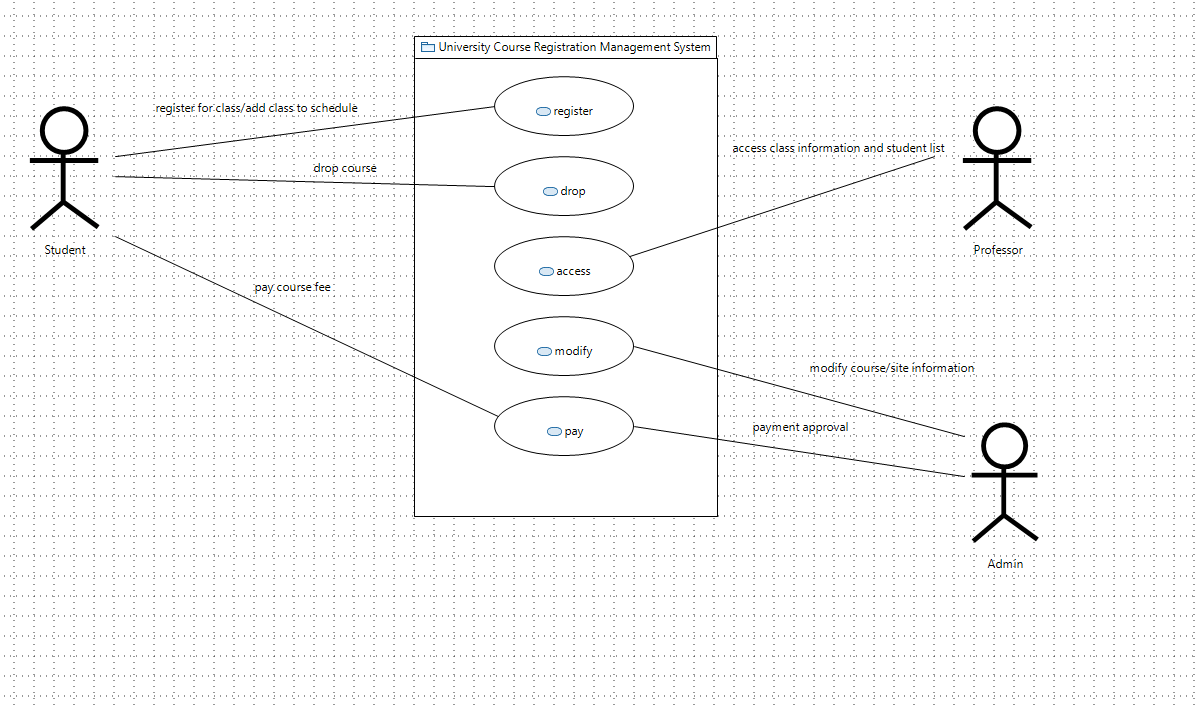
**Sequence Diagram (for student)**



**Communication Diagram (for student)**



**Use Case Diagram**



**Architecture Style**

Chosen Style: Main program with subroutines

**General Purpose:**

* The Main Program and Subroutine Architecture supports system modifiability, scalability, and performance. It is a classic programming pattern, by separating functionality into modules (subroutines), the architecture separates concerns into smaller amounts of complexity, thereby managing the complexity more effectively.
* In the Main and Subroutine architecture, there is typically a single thread of control and each component in the hierarchy get this control from its parent and passes it along to its children. Remote procedure call systems are Main and Subroutine system that are decomposed into parts that live on computers connected via a network. The actual assignment of parts to processors is deferred until runtime.
* **Advantages**:
  + Easily modified: As our system requires the ability to change and adapt as the students and their requirements change, it makes this style of architecture valuable.
  + Growable system functionality by adding more modules (subroutines): This style allows us to add functionality as requirements change by simply creating more subroutines to fulfill those specific needs.
  + Simple to analyse control flow: As seen by the Sequence Diagram (Page 4), our system boils down to a generally single-threaded operation and thus makes the analysis of control through the system simple.

**Implementation:**

* **Problem:** The course registration management system can be described in the form of a hierarchy where the top of the hierarchy is the web interface that students, professors, and admins interact with. This program then invokes other modules when needed, such as accessing the database to retrieve course information, communicating with the billing system, or modifying access of users in the program.
* **Components:** This project requires a group of procedure calls as well as a memory component to store course information for every module.
* **Connectors:** Procedure calls and shared access to global data in memory component.
* **Control Structure:** There is one main thread of control being manipulated by the main web interface.

**EX:**

